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The Acquisition Process for Major Defense Systems

Steven M. Freer

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THE ACQUISITION PROCESS FOR
MAJOR DEFENSE SYSTEMS

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STEVEN M. FREER

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On April 5, 1976, the Director, Office of Management and Budget (OMB) and the administrator, Office of Federal Procurement Policy (OFPP), issued a new policy for the acquisition of major systems by all executive branch agencies. This new policy was implemented through OMB Circular No. A-109. This circular was intended to effect reforms that will reduce cost overruns and diminish the controversy on whether or not new systems are needed.

From a budget standpoint this policy governs the acquisition of hundreds of billions of dollars of future major systems needs. The agencies may as provided by OMB Circular A-109, prescribe additional criteria for determining which agency programs are to be classified as major systems.

OMB Circular A-109 requires:

1. Top level management attention to the determination of agency mission needs and goals.
2. An integrated systematic approach for establishing mission needs, budgeting, contracting and managing programs.
3. Early direction of research and development efforts to satisfy mission needs and goals.
4. Improved opportunities for innovative private sector contributions to national needs.
5. Avoidance of premature commitments to full scale development and production.

6. Early communication with Congress in the acquisition process by relating major system acquisitions to agency mission needs and goals.

Circular A-109 specifies certain key decisions and outlines the logical sequence of activities in the major system acquisition process.

Circular A-109 defines major system as, "A combination of elements that will function together to produce the capabilities required to fulfill a mission need. The element may include, for example, hardware, property, equipment, software, construction or other improvements or real property. Major system acquisition programs are those programs that:

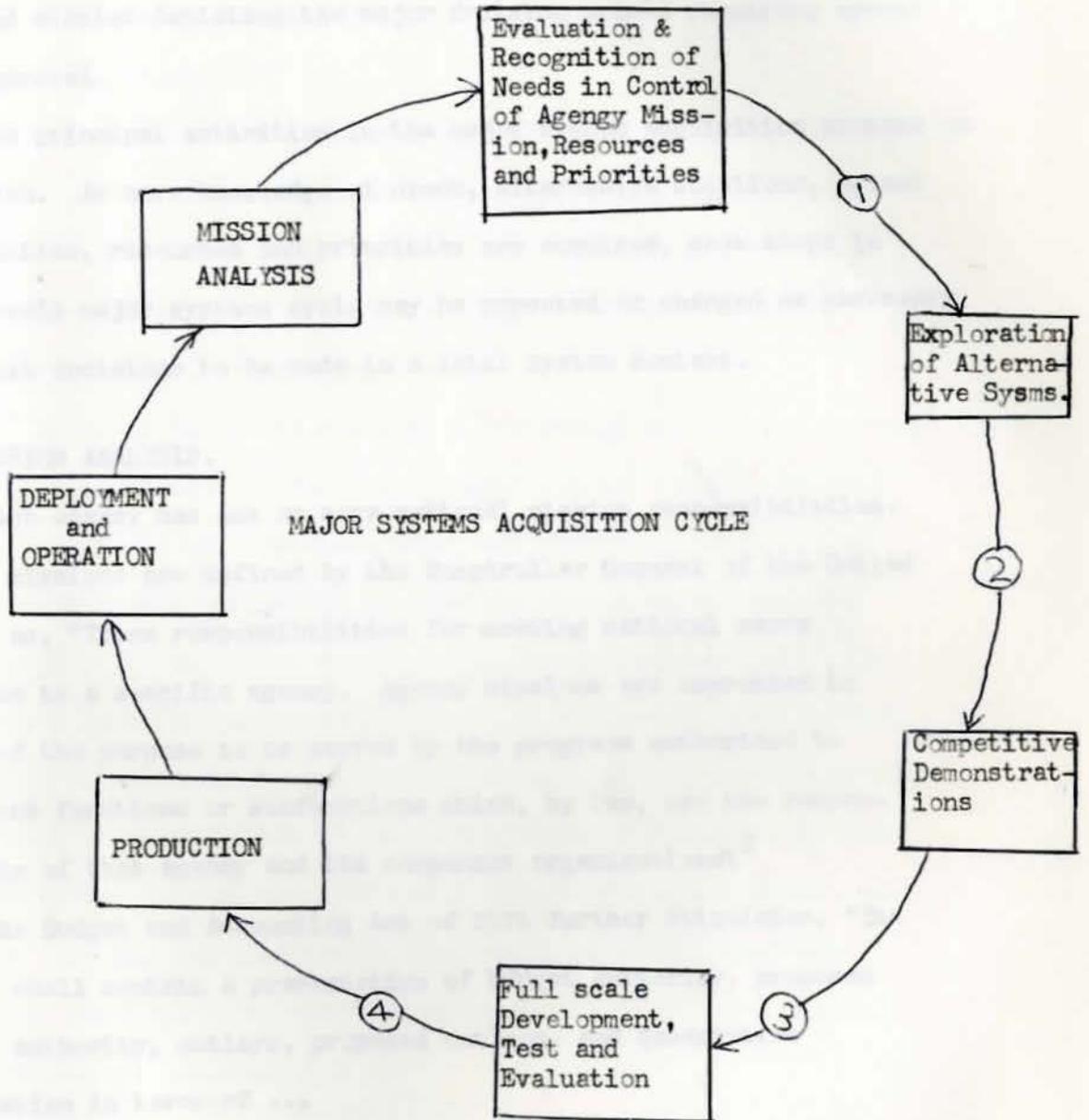
1. Are directed at and critical to fulfilling an agency mission.
2. Entail the allocation of relatively large resources.
3. Warrant special management attention.¹

MAJOR SYSTEM ACQUISITION CYCLE

Each major system acquisition program has its own unique features; no two are identical. Differences in time, cost, technology, management, and contracting approach must be recognized. Despite the differences, the basic acquisition process is common to all programs. Figure A illustrates the basic cycle or process

¹Office of Management and Budget Circular A-109.

FIGURE A



with the boxes describing the types of activities involved, and the numbered circles depicting the major decision points requiring agency head approval.

The principal activities in the major system acquisition process are iterative. As more knowledge of needs, alternative solutions, actual capabilities, resources and priorities are acquired, some steps in the overall major systems cycle may be repeated or changed as necessary to permit decisions to be made in a total system context.

A. MISSION ANALYSIS.

Each agency has one or more national mission responsibilities. Agency missions are defined by the Comptroller General of the United States as, "Those responsibilities for meeting national needs assigned to a specific agency. Agency missions are expressed in terms of the purpose to be served by the programs authorized to carry out functions or subfunctions which, by law, are the responsibility of that agency and its component organizations".²

The Budget and Accounting Act of 1974 further stipulates, "The budget shall contain a presentation of budget authority, proposed budget authority, outlays, proposed outlays, and descriptive information in terms of ...

1. A detailed structure of national needs which shall be used

²Budgetary Definitions, Comptroller General of the United States, Nov., 1975.

to reference all agency missions and programs;

2. Agency missions and

3. Basic Programs."³

To the extent practicable, each agency shall furnish information in support of its budget requests in accordance with its assigned missions in terms of Federal functions and subfunctions, including mission, responsibilities of component organizations, and shall relate its programs to agency missions.

OMB Circular No. A-109 requires a continuing analysis of current and forecasted mission capabilities, technological opportunities, overall priorities and resources which are involved. When the analysis identifies a deficiency in existing agency capabilities or an opportunity to establish new capabilities in response to a technologically feasible opportunity, this will be formally set forth in a "mission element need statement". A mission element need statement (MENS) is a statement prepared by a Department of Defense component to identify and support the need for a new or improved mission capability. The mission need can be the result of a projected deficiency or obsolescence in existing systems, a technological opportunity to reduce operating cost.⁴

³Budget and Accounting Act, 1974.

⁴John L. Farnsworth, Farnsworth Procurement Dictionary, Sun Valley, California, 110300 Contlay St., 1960.

The Mission Element Need Statement is submitted to the agency head for approval. Once approved, the agency components can move directly forward with the confidence of their need being recognized. This need is then usually communicated to Congress to consider the major needs of all agencies and the decision to initiate new acquisition programs on a comparative basis. The primary objective here is to have any issues requiring debate by Congress regarding needs occur early in the major system acquisition process before the commitment of major resources and selection of solutions.

Approval of the mission need starts the major system acquisition process by granting authority to explore alternative system design concepts. This approval and the establishment of a system acquisition program does not automatically mean that a new major system will eventually be acquired. This is mere dreaming! With an approved need, designated agency components may continue to analyze other optional means of satisfying the need in parallel with the exploration of alternative systems which may, as development proceeds, prove unacceptable. In Department of Defense for example, the mission need may best be satisfied by a change in doctrine, by deployment of additional personnel, by modification of existing equipment, by procurement of additional equipment already in production, by training, or by a new major system acquisition effort, to name but a few.

B. EVALUATION AND RECONCILIATION OF NEEDS IN CONTEX OF AGENCY MISSION, RESOURCES AND PRIORITIES.

An evaluation of the options, including the alternative system design concepts, provides the basis for subsequent key decisions in the major acquisition process.

Before discussing the exploration of alternative systems design concepts, let me enlighten you a little on the program manager and some of his responsibilities and duties. You should discuss all major concepts with the program manager and find what his major acquisition strategy is. The program manager's role, the acquisition strategy and the ensuing system acquisition plan encompass the entire system acquisition process.

A program manager should be designated for each major system acquisition program as soon as possible after the mission need decision to explore alternative system design concepts.

Program objectives are developed that set forth the capability (in mission need not equipment solution terms) cost, and schedule goals being sought in the system acquisition program. These objectives are required to be incorporated in a written charter, which defines the authority, responsibility, and accountability of the program manager. Such a charter can be equated into a contract between the program manager and the agency.

The program manager should be designated for each individual

major acquisition and ideally he should be a multidiscipline, experienced manager with sufficient tenure and interest in the program to provide continuity and to accrue personal accountability for his actions.⁵ An initial responsibility of the program manager should be to recruit a staff or identify a team with the requisite skills and experience to manage the assigned system. The organization and management level of the program manager should be consistent with the importance and scope of the program.

One of the program managers first tasks will be to develop an acquisition strategy. The purpose is to get the program manager, with his team, to think through the acquisition process and the myriad of individual considerations and then join them to achieve his program objective in an economical effective and efficient manner.

In developing a system acquisition strategy, considerable thought should be given to specific program goals and objectives. The approach should not be reduced to a simple fill in the blank format.

The strategy should form the basis for the program manager's system acquisition plan. He should then use his plan to communicate with higher authority, his management team, interfacing government organizations, and industry. The plan should also provide the means to measure accomplishments and consider contingencies as the pro-

⁵Edward J. Engoron and Albert L. Jackson, Jr., "Configuration Management", Defense Management Journal, Fall 1968.

gram progresses. At program initiation, it is neither possible or desirable to address all considerations in detail. It is possible and desirable, however, to examine and schedule when decisions on each consideration can and must be made throughout the acquisition process and to refine the strategy and planning as the program proceeds.

The acquisition strategy should encompass the entire system acquisition process with emphasis on the near term time phased actions.⁶ As the program proceeds, * * periodic reviews are made, and the next increment of near term considerations should be emphasized. Such an approach minimizes the planning burden and provides a basis for program direction and for measurement of success against program goals and objectives.

Circular A-109 includes policies and some typical considerations that should be addressed in the development of a strategy and then reflected in a system acquisition plan. For example, the general policy to rely on the private sector in accordance with OMB Circular No. A-76; the use of contracting as a tool in the acquisition process and not as a substitute for management; the use of competitive parallel short-term planned dollar value contracts for well-defined work activities during exploration of system design concept alternatives; and the preclusion of nonessential reporting procedure and paperwork requirements being placed on contractors.⁷

⁶Defense 81, "Getting Ourselves Together on System Acquisitions".

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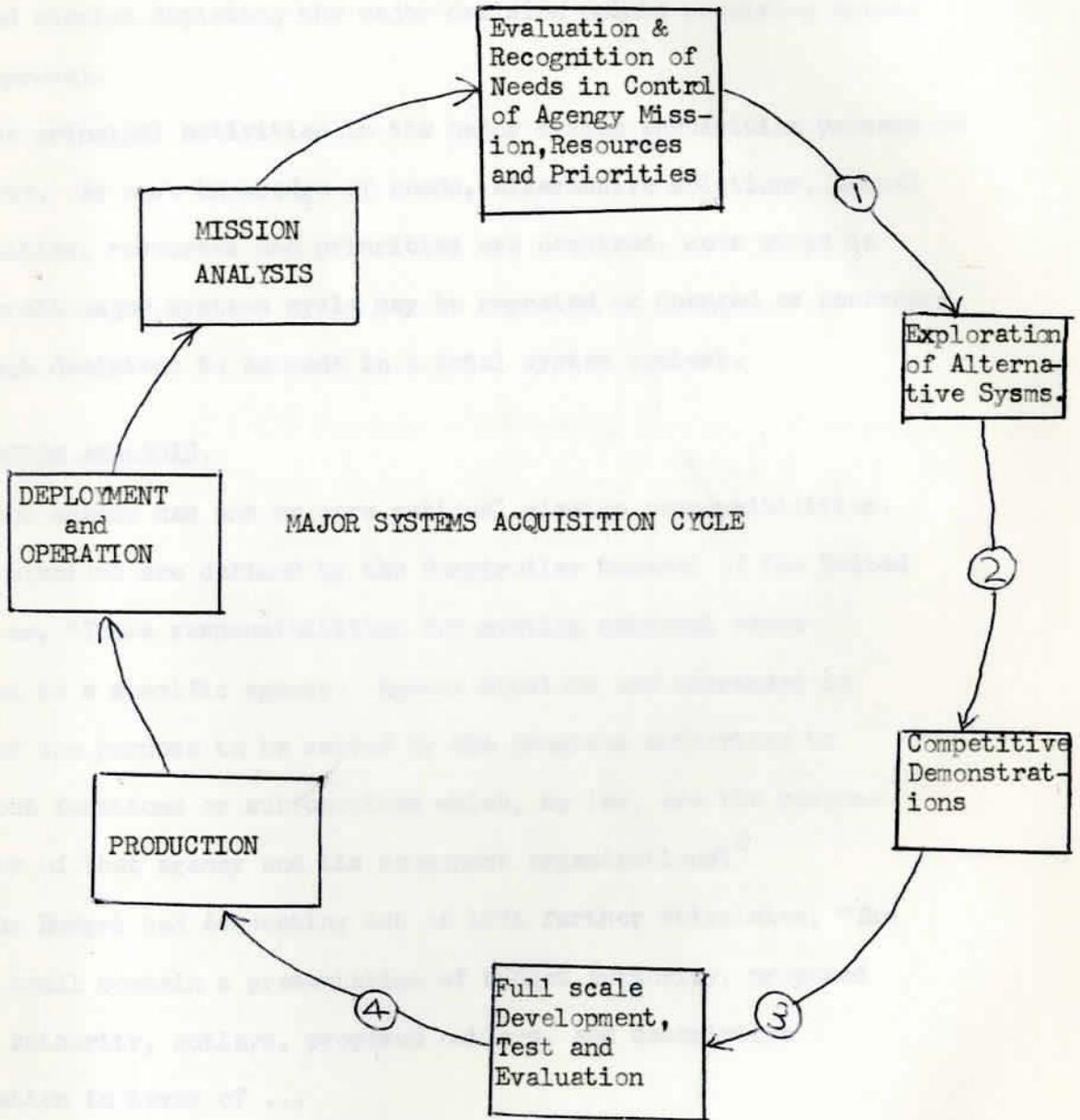
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There are many other necessary considerations not included in Circular A-109 that need to be addressed by a program manager. For example, the favorable as well as the unfavorable lessons learned from similar acquisitions. Still others may be grouped in categories such as system/product development, business management, and program management.

Some system/product development examples include: recognition of and accommodations for risks and uncertainties that assures proper relationships of risk sharing between the Government and contractors' efforts and the time phased introduction of the results into the acquisition process (the objectives being to avoid non-essential constraints on either prime or subcontractors); the Government providing guidelines for contractor development of performance specifications for full scale development and product specifications for production, and the optimal use of government laboratories in furnishing technical direction to the contractors during system development.⁸

Some business management examples include:

1. Obtaining and sustaining competition, including high cost subsystems which may be proposed.
2. Accommodating procurement lead-time, precluding technical transfusions and "auctions" in the proposal evaluation, source

⁸U.S. Dept. of the Air Force, HQ Air Force Logistics Command, Acquisition Management, Standard Integrated Support Management Systems, AFLC/AFSCR800-24., Wright Patterson AFB, OH, n.p.1977.

selection, and negotiation process and providing contractually for proposal submittals for the next planned increment in the acquisition process.⁹

Some program management examples include:

1. Selection of a project management organizational mode such as vertical or matrix.
2. The appropriateness and applicability of incremental approvals of contractors efforts throughout the acquisition process.
3. The applicability of Government policies for standardization and interoperability with systems of friendly countries.¹⁰

In conjunction with the development and tailoring of an acquisition strategy, the program manager should establish an analysis structure and decision mechanism to handle both short-term considerations for system acquisition management.

The solicitation in terms of mission need is a key action in the process since industry is to be formally requested to respond with their alternative system design concepts to satisfy the approved mission need. The contractors should be free to propose their own technical approach, main design features, subsystems and alternatives to schedule, cost and capability goals. The purpose of this type of solicitation is to gain the benefits of industry innovation and

⁹John W. Ward, Manual of Purchasing Organization and Procedures, Civic Federation, Chicago, Ill., 1965.

¹⁰Ibid.

Proposals should be evaluated and the most promising system design concepts selected for further exploration. The selection should be based on a review by a team of experts, from inside and outside the organization which are part of the program management technical support team. The review should consider:

1. Capability of the proposed systems to meet the mission need and program objectives, including resources required.
2. Benefits to be derived by trade-offs, where feasible, among technical performance, acquisition costs, ownership costs and time to develop and procure.
3. Relevant accomplishment record of the competitors and the competence of their key personnel.¹¹

C. EXPLORATION OF ALTERNATIVE SYSTEMS.

Just because your need has been recognized does not mean that a new major system is the answer. The engine goes kaput on your car but that doesn't mean you can rush to the dealer and get a new one. A lot must first be considered such as repairing your junker or whether or not a new car is the answer and if so will your budget allow it? The exploration phase is identical to this situationyou must look at many different angles and consider many possibilities.

¹¹United States Department of Defense, Department of Defense Directive 5000.3 Test and Evaluation, Washington, D. C., 26 Dec. 69.

D. COMPETITIVE DEMONSTRATIONS.

When risks can be accommodated and progress indicates that a proof of concept demonstration is in order, the alternative system design concepts selected for consideration for competitive demonstration are to be submitted to the agency head for approval, along with other alternatives which were identified and evaluated. The other alternatives may have been evaluated in preceding steps or in conjunction with the exploration of alternative system design concepts. This includes a reaffirmation of the mission need and the program objective.

The program manager should assure that small or large firms selected for competitive demonstration have submitted an adequate plan for the necessary plant and equipment to accomplish full-scale development and production. This plan may include purchase or lease arrangements or teaming arrangements with companies which have the necessary plant and equipment.

Competitive demonstrations are intended to verify that the chosen concepts are sound, perform in an operational environment and provide a basis for selection of the system design concepts to be continued into full-scale development. Such demonstrations normally involve some type of prototypes - - - these may range from a principal end item or critical subsystem, to a limited and less than

complete development model.

The winning concept and contractor of the demonstration evaluation may move into full-scale development and initial production.

The competitive demonstration contracts should provide for contractors to develop and submit proposals for full-scale development and initial production by the conclusion of the demonstration. The contractors should be furnished operational test conditions, mission performance criteria and life cycle cost factors which will be used by the agency in evaluation and selection for full-scale development.¹²

E. FULL-SCALE DEVELOPMENT PHASE.

Once demonstration has verified that the chosen system design concepts is sound and the risk are acceptable - competition between similar or differing system design concepts may be extended throughout the entire acquisition process whenever it is economically beneficial to do so. Therefore, contractors who successfully complete demonstration of their design concepts may be awarded contracts for subsequent full-scale development. When the mission need and program objectives are reaffirmed, the agency head may authorize full-scale development and initial production.

¹²Paul R. McDonald, Government Prime Contracts and Subcontracts, Procurement Associates, Glendora, Cali., 1964.

System and contractor selection for full-scale development should be made on the basis of:

1. Essential system concepts performance measured against mission need and program objectives.
2. An evaluation of remaining risks and potential resolutions.
3. An evaluation of estimated acquisition and ownership costs.
4. Such factors as the contractor's demonstrated management, financial and technical capabilities to meet program objectives.¹³

The program manager is required to monitor program progress as well as contractor progress in fulfilling contract performance, cost and schedule commitments. Significant actual or forecast variances from plans are to be analyzed and alternatives considered with action taken or recommendation for actions brought to the attention of the appropriate contractor or government management authority.

Initial production units are to be tested and evaluated in an environment that assures effective performance in expected operational conditions. Usually the testing is to be done independent of the agency's development and user organizations. Exceptions to independent testing may be authorized by an agency head under certain circumstances as physical or financial impracticability or

¹³C. Dwight Brooks, Manager Purchasing Administration, Burroughs Corp., Detroit, Mich., 1968.

extreme urgency.

The full-scale development/initial production contract should provide for the contractor to develop and submit proposals for production. To facilitate the development of these proposals, the contractors should be furnished schedule data, provisioning requirements, etc. which will be used in making the production decision.

Under the Full-Scale Development and Limited Production Phase certain items must be considered regarding the system. They are:

1. Mission element need reaffirmed and interactive threat analysis updated.
2. System selected meets need and is cost-effective.
3. Trade-offs between cost, performance, schedule, and logistic supportability are acceptable.
4. Uncertainties/risks are identified and acceptable.
5. System requirements adequately specified and include:
 - a. Performance.
 - b. Design-to-cost and life-cycle cost.
 - c. Nuclear survivability.
 - d. Electromagnetic compatibility.
 - e. Electronic/infrared/optical countermeasures.
 - f. Producibility.
 - g. NATO standardization and interoperability.

h. Logistics Supportability.

6. Reliability and maintainability goals and thresholds established.

7. Manpower goals and thresholds identified.¹⁴

Management issues to consider are:

1. Updated acquisition strategy supports program objectives and is being properly executed.
2. Affordability confirmed; life-cycle costs within amounts reflected in latest report or compensating changes made.
3. Program management structure sound and adequately supported.
4. Program management plans complete and include:
 - a. Approach to resolve remaining uncertainties and risks.
 - b. Realistic fall-back action and alternatives.
 - c. Business plans to support strategy; contract types consistent with objectives.
 - d. Competitive selection of subsystems; consideration of existing military or commercial hardware/software.
 - e. Consideration of foreign developments.
 - f. Requirements for long-lead procurement and initial limited production; coordination (when appropriate) with single manager for conventional ammunition.
 - g. Firm and realistic cost, performance and schedule

¹⁴Alan R. Booz, Acquisition Process for Major Defense Systems, Washington, D. C., Jan. 80.

estimates, and thresholds established.¹⁵

F. PRODUCTION.

Following satisfactory test results and reconfirmation of mission need and program objectives, the agency head may authorize full production. As production systems become available, they are deployed into operation use, thereby providing the capability originally identified in the mission element need statement. This new capability then becomes a factor in the continuing mission analysis of the agency and the cycle continues.

Some system issues to consider during the production/deployment phase are:

1. Mission element need reaffirmed and interactive threat analysis updated.
2. Development progress and OT&E results support decision to proceed:
 - a. Cost, schedule, performance and supportability trade-offs acceptable.
 - b. Design to cost and life cycle cost requirements realistic.
 - c. System cost-effective and affordable; remains best alternative.
 - d. Major problems identified/resolved.
 - e. Production quantity requirements valid.

¹⁵Ibid.

f. Support subsystems for initial operational units assessed.

g. Goals and thresholds established for initial deployment.

h. Manpower and training requirements developed.¹⁶.

G. DEPLOYMENT AND OPERATION PHASE.

Once the production phase is under way we slowly creep into the Deployment and Operations phase. At this point, we should concern ourselves with introducing, supporting and improving the new or revised major system acquisition. Using personnel must be trained properly and know exactly what they are to do with this new system.

I have covered each phase in the major acquisition cycle. Many people have not been pleased with our system acquisition program President Ronald Reagan, being one of these people. On March 17, 1981, President Reagan issued a Presidential Memorandum to Secretary of Defense, Caspar Weinberger. This memorandum was as follows:

We were concerned, as I am sure you were, to learn of the significant cost growth in a number of Defense programs. We recognize that a portion of this increase is due to inflation.

¹⁶Ibid.

However, we need to make certain that the increase does not also signal program management weaknesses or technical problems in the Defense programs that could present us with precipitous cost growth problems.

We would appreciate by early April your assessment of these problems and of actions underway to reduce such cost growth to a minimum in the future.¹⁷

Signed: Ronald Reagan

The System Acquisition Assessment reviewed all major studies of the last ten years on the subject and solicited the opinions of all major groups and key individuals involved in the acquisition process. Here are the major problems with the Department of Defense acquisition system as seen from five different perspectives as of April.

CONGRESS/GENERAL ACCOUNTING OFFICE VIEW.

They feel services try to do too much at one time--always looking for quantum jumps in capability which cause excessive cost. They feel there is no one in control - too much interservice competition for funds, failure to kill marginal programs, acceptance of huge cost growth and smaller procurements, all lead to congressional

¹⁷Presidential Memorandum No. 0810580, March 17, 1981.

perception of lack of management control and clear direction. Early cost, schedule and performance estimates are consistently overly optimistic and highly unrealistic . . . in other words, contractors are permitted to "buy in"(sign a contract for less than the program cost) ...Contractors are not held to contract requirements. They feel the contracts are too loose. Readiness considerations are always secondary to hardware procurement and deployment. System requirements/cost are considered as individual packages - no sense of a long-range plan for meeting mission requirements and overall cost objectives.

OFFICE OF THE SECRETARY OF DEFENSE VIEW.

The Secretary of Defense and his office felt there are too many systems competing for scarce resources. Failure/inability to "weed-out" low priority programs in order to fully fund and efficiently execute the higher priority systems.

Inadequate consideration of affordability at the Defense Systems Acquisition Review Council because of lack of a stable long-range plan and funding. Lack of discipline of system technical requirements. Inadequate cost/performance schedule trade-offs during conceptual design. They feel the acquisition cycle is too long and that support and readiness is inadequately addressed.

SERVICE VIEW.

The service personnel believe there is an extremely excess amount of paperwork and reviews involved in the major system acquisition process. They further feel there is an unrealistic demand for hard numbers and solutions "up front" when unknowns exist. Lack of an effective OSD Acquisition Authority allows unchecked proliferation of directives, tasking, and uncoordinated policy. Statutory responsibility of services to determine requirements usurped. Inflexible budgetary rules impede transition from development to production.

PROGRAM MANAGER VIEW.

The program managers feel there are too many reviews by too many layers of people from the Office of Secretary of Defense and the service. They felt there were too many regulations and reports. Costs required too far in advance of expenditure dates. The control of resources disconnected from responsibility for system readiness is a big disadvantage.

INDUSTRY VIEW.

Industry feels instability is caused by starts, stops, stretchouts, redirections, and inordinately long decision times. Acquisition practices discourage or prevent capital formation and

investment. They felt there was overmanagement by the Government, in particular:

1. Excessive surveillance (audits, reviews, etc) of all aspects of contractor management.
2. Unproductive and costly requirements for excessive technical final and management data.
3. Time-consuming and program-destabilizing unproductive micro-management of the acquisition process at all levels of service agencies and in OSD.¹⁸

Industry feels over emphasis on price competition leads to lack of cost realism. Industry believes that final decisions are based principally on cost and that successive competitions are used to drive contract price down - which really is not true. Inflation guidelines used by the Department of Defense have been unrealistically low, leading to underfunding and program instability. Industry further feels inappropriate contract types are used where major uncertainty exists. For example fixed price for development and early production. Many government personnel have adverse attitudes on this subject, also.

ACQUISITION MANAGEMENT PRINCIPLES

The eight major acquisition management principles announced

¹⁸ Defense 81, "Big Changes in System Acquisition", Oct. 81.

by Secretary Weinberger are as follows:

1. We must improve long-range planning to enhance acquisition program stability.
 2. Both OSD and the services must delegate more responsibility, authority, and accountability for programs, in particular, the service program manager should have the responsibility, authority, and resources adequate to execute efficiently the program for which he is responsible.
 3. We must examine evolutionary alternatives which use a lower risk approach to technology than solutions at the frontier of technology.
 4. We must achieve more economic rates of production.
 5. We must realistically cost, budget and fully fund in the Five Year Defense Plan, and Extended Planning Annex, procurement, logistics and manpower for major acquisition programs.
 6. Readiness and sustainability of deployed weapons are primary objectives and must be considered from the start of weapon system programs.
 7. A strong industrial base is necessary for a strong defense. The proper arms-length relationships with industry should not
-

be interpreted by Department of Defense or industry as adversarial.

8. Department of Defense managers at all levels should expand their efforts to obtain maximum competition for their contractual requirements.¹⁹

CARLUCCI AND WEINBERGER.

The new Reagan Administration chose Secretary of Defense Caspar Weinberger and Deputy Secretary of Defense Frank Carlucci to improve the problem riddled Department of Defense process whereby major systems are acquired. This is exactly what they intended to do!

Mr. Carlucci feels the primary objectives in streamlining the Department of Defense Acquisition process are reducing costs and shortening the acquisition time. "The Secretary and I are determined to reduce substantially cost overruns, deploy adequate quantities of needed systems that are operationally effective and ready, and do this in the shortest possible time," Mr. Carlucci stated.²⁰

Mr. Carlucci also pointed out, that while Department of Defense should be tough in contract negotiations as part of the buyer-seller relationship, this does not mean that relationships between management and industry should necessarily be adversarial. Industry

¹⁹Defense 81, "Getting Ourselves Together on Systems Acquisitions", October 81.

²⁰Ibid.

and government have a shared responsibility and must assume a new spirit of cooperation. A healthy, innovative and competitive industrial capability is a primary national objective.

THE ACQUISITION ASSESSMENT TEAM

An assessment team was formed with all major OSD offices, the services, and the logistics commands being represented to conduct a study of our major acquisition system process. Those serving on this committee were:

1. Vincent Puritano - Steering Group Chairman
2. Paul Berenson - Working Group Chairman
3. Milt Margolis - Team A, Reducing Costs
4. Brigadier General Roger Peterson - Team B. Shorten

Acquisition Time.

5. Russ Shorey - Team C. Analysis of Support and Planning.
6. RADM Lee Kollmorgen - Team D. Assess DSARC Process.
7. Bob Trimble - Team E, Multiyear Procurement.

Mr. Milt Margolis had the responsibility of reviewing our costs and to see how they could be lowered. He found program instability and other factors - many of them procedural - combine to make system costs higher than they would otherwise be. Some of these factors encourage low cost estimating at the outset of a program, inevitably leading to cost overruns later on. Moreover,

existing rules sometimes make it difficult for industry to do as well as it might for the Department of Defense.

1. Program Stability. The cost, both in time and money, of program instability can be seen in the December 1980 Selected Acquisition Reports*(SARs) for 47 major programs. These SARs reflected a 129% cost growth over the original estimates.

Reasons for the cost growth were: economic or inflation(27%) quantity changes(26%); estimating changes(18%); schedule changes (15%); support changes(7%); engineering changes(5%); and other changes(2%). Forty-one percent of all cost growth was due to quantity and schedule changes.²¹

While it is evident cost growth is up our realization of this problem does not reduce budget flexibility.

Brigadier General Roger Peterson did an in depth study of Acquisition Time and looked for short-cuts or ways to cut red tape to get the job done faster. The World War II P-38 for instance was ready to fly within two years after the contract was made while the F-15 took a full decade to acquire. There is no wonder the Pentagon intends to shorten acquisition time.

A major factor in the long time it takes to field a new system has been the "revolutionary" philosophy of development and

²¹Defense 81, "Reducing Acquisition Costs", October 81.

acquisition, which reaches for new and untried technology at the outer limits of the state of the art to meet a military threat. This approach does offer potentially dramatic payoffs, but frequently it ends up with large cost increases and schedule slippage as "unknown unknowns" are confronted.

A wiser direction is the evolutionary approach, an alternative that minimizes technological risk but which consciously inserts advanced technology into a program through planned upgrades of deployed subsystems. In this manner, the lead time to field technological advances can be shortened, while an aggressive scheduled fielding of performance improvements can be expected during the service life of the system. This concept is called "Preplanned Product Improvement" and is commonly used in commercial industry.

The General requested the upgrading of present systems when feasible rather than new major systems. His reasoning for this was to reduce development cost and take best advantage of technological advance. This advantage is that the Department of Defense can reduce acquisition time, reduce development risk and cost, and enhance fielded performance through the deployment of upgrades. A revolutionary approach can always be adopted when, and if the demands of a threat or other compelling military needs require such an approach.

Front-End Planning. Time can be saved in the acquisition process by emphasizing reliability and testing up front and eliminating lengthy and costly problem identification and correction efforts. This also allows realistic concurrent development and operational testing.

Doing this, however, requires an increase in funding for more testing in the early stages of program development. Acquisition strategies will have to take that into account.

Russ Shorey surveyed the support and planning involved in the major acquisition process and as a result found recurring problems with weapon system supportability, acquisition policies were recently revised to emphasize support issues, including reliability, maintenance, spares, test equipment, and maintenance manpower. These policies are generally sound and therefore improved readiness in an asset. It should be stressed the delivering of equipment to the troops with reliability and readiness for which it was designed is a must.

The focus on shortening the development process is potentially in conflict with initiatives to improve reliability and support. Whereas the fastest acquisition approach involves initiating production prior to test of development models, the highest confidence

of achieving reliability and other support goals in fielded hardware involves iterative design and testing before high-rate production. A balance must be struck on each program. Many of the serious problems in current systems result from not striking the correct balance.

For those systems which are run on a fast track, there are requirements for additional early funding to design in reliability and support characteristics - including the need to pay this price in parallel or competing developments. Additional in-house talent must be brought to bear, and industry incentives need to be applied to avoid previously experienced support problems.

Because of the relative priority of reliability and support efforts compared to performance objectives and the current shortage of in-house talent to address these problems, specific top management attention, priority, and stress on support resources is needed.

Mr. Shorey decided it would be advantageous to the system if an early decision on the approach, additional resources, and incentives which will be used to balance the risks in the reliability and support area on each program. The vehicle for decision can be an acquisition strategy prepared by the program manager.

Mr. Kollmorgen assessed the Defense Systems Acquisition Review Council(DSARC) and requested the following improvements. A major complaint by the services and service program managers was that the Defense Systems Acquisition Review Council process itself was primarily to blame for the excess amount of paperwork and reviews for the minute and detailed management of program technical issues by central staff members. Proliferation of reporting requirements of regulation both within the Office of the Secretary of Defense(OSD) and in the services all flowed from the detailed decision point review process which provided for four discrete decision points on all major weapon systems.

After Mr. Kollmorgen reviewed the problems experienced in this area, the Secretary and Deputy Secretary of Defense decided to reduce the decision points for major systems to two and to decentralize the other two to Service Secretaries. The objective in this decision is to reduce the administrative burden by fewer Office of the Secretary of Defense level reviews, to link reviews more closely to major expenditure decision points, to delay Secretary of Defense program commitment until program technical, performance, and cost factors are more accurately determined, to provide more efficient transition between development and production, and to decentral-

No full there were also some disadvantages to the multiyear

ize more authority to the services.

Mr. Trimble assessed the Multiyear Procurement function and found inflexible adherence to the traditional year by year approach to procurements through annual appropriations has denied us certain efficiencies and economies. It has also added unnecessarily to uncertainty and administrative costs.

He believes it is essential that the Department of Defense be able to use a multiyear procurement approach, with the programs in which it is to be employed selected on a case by case basis following analysis of the benefits and the costs. Multiyear procurement could result in average dollar savings of 10 to 20 percent in unit procurement cost through improved economies and efficiencies in production processes, economy of scale lot buying, decreased financial borrowing costs, better utilization of industrial facilities, and a reduction in the administrative burden of placing and administering contracts. He also felt the stimulated investment in production equipment will result in lower defect, higher quality products. The market stability will also enhance the continuity of subcontractor supply lines and thereby decrease acquisition time. Surge capability will be improved.

He felt there were also some disadvantages in the Multiyear

Procurement process. This funding technique fences in money and commits future Congresses and future Secretaries of Defense. If this system is excessively used, it would significantly reduce the flexibility of the Secretary to respond to unforeseen changes in the external threat. If a multiyear procurement were used to lock in a borderline program, costs would be increased if the program were cancelled.

To avoid these potential disadvantages, Mr. Trimble recommended the following criteria as general guidelines for screening potential multiyear candidates:

1. significant benefit to the government.
2. stability of requirements, configuration, and funding
3. degree of confidence in cost estimates and contractor capabilities.²²

When the review and assessment was completed by the Acquisition Assessment Team, there was a broad consensus among all the team members that the acquisition process needed major repair. By summarizing all of the problems each of the team members were confronted with it would be common belief that the process would take too long, cost too much and is too complicated and would not be very efficient.

THE 31 RECOMMENDATIONS AND ISSUES

The Acquisition Assessment Team made 31 recommendations and

²²Defense 81, "Getting Ourselves Together on Systems Acquisition", October 81.

issues to reduce costs and improve the acquisition process throughout the Department of Defense. Through this paper I will explain each recommendation thoroughly and highlight the eight issues, many of which have already been approved and are now in effect.

RECOMMENDATION I - MANAGEMENT PRINCIPLES

The Acquisition Assessment Team(Steering Committee) recommended that the Deputy Secretary of Defense reaffirm certain major acquisition management principles. These major principles are:

1. An improved statement of long-range Defense policy, strategy and resources will be provided to the Services in order to establish a framework for military objectives, goals and mission planning to enhance program stability.
2. Responsibility, authority and accountability for programs should be at the lowest level of the acquisition organization at which a total view of the program rests.
3. Service Program Managers should have the responsibility, authority, resources, and guidelines adequate to efficiently execute the program. This should include the system specific acquisition strategy for attainment of the required operational and readiness capability, and appropriate flexibility to tailor the acquisition strategy to estimates of the development priorities and risks.

4. Alternatives which use a lower risk approach to technology must be examined when new programs are proposed. Solutions at the frontiers of technology must provide an alternative which offers an evolutionary approach. Pre-planned Product Improvement should become an integral part of the Acquisition Strategy.

5. Achievement of economic rates of production is a fundamental goal of the acquisition process.

6. The Services should plan to realistically budget and fully fund in the Fiscal Year Defense Plan and Extended Planning Annex the Research and Development, procurement, logistics and manpower costs at the levels necessary to protect the acquisition schedule established at program approval points, and to achieve acceptable readiness levels.

7. Improved readiness is a primary objective of the acquisition process of comparable importance to reduced unit cost or reduced acquisition time. Resources to achieve readiness will receive the same emphasis as those required to achieve schedule or performance objectives. Include from the start of weapon system programs designed in reliability, maintainability and support.

8. The proper "arms-length" buyer seller relationship should not be interpreted by government or industry as adversarial. The DOD should be tough in contract negotiations, but weapons acquisition

should be managed on a participating basis using industry as a full constructive team member. A strong industrial base is necessary for a strong defense.

RECOMMENDATION 2 - PREPLANNED PRODUCT IMPROVEMENT.

A revolutionary system development approach which uses new and untried technology to meet a military threat can offer dramatic potential payoffs, but frequently ends up with large cost increases and schedule slippages.

An evolutionary approach offers an alternative which minimizes technological risk, and consciously inserts advanced technology through planned upgrades of those deployed subsystems which offer the greatest benefits. In this manner the lead time to field technological advances can be shortened while an aggressive scheduling of fielded performance improvements can be expected during the service life of the systems. This Preplanned Product Improvement concept is commonly used in commercial industry.

It is recommended most new and existing systems should be partitioned for performance growth through the application of upgrades to key subsystems in order to reduce development risk, and take best advantage of technological advance.

The advantages of this concept can reduce acquisition time, reduce development risk and cost, and enhance fielded performance

the deployment of upgrades. A revolutionary approach can always be adopted when the demands of the threat or other compelling military needs require such an approach.

The disadvantages of the pre-planned product improvement concept is the performance needed to meet a critical threat may dictate the use of distant technology, but the factors involved in such a decision are seldom incisive. Therefore, the choice between alternatives is not likely to be absolutely clear.

RECOMMENDATION 3 - MULTIYEAR PROCUREMENT

Regarding Multiyear Procurement, it is encouraged based upon a case-by-case benefit risk analysis. Multiyear procurement could result in an average dollar savings between 10 to 20% in unit procurement cost through improved economies and efficiencies in production processes, economy-of scale lot buying, decreased financial borrowing costs, better utilization of industrial facilities and a reduction in the administrative burden in the placement and administrative work involved in contracts. Higher quality products will result in the stimulated investment in production equipment. There will be a lower defect rating in products. The market stability will also enhance the continuity of subcontractor supply lines and thereby, decrease acquisition time.

The primary disadvantage of this recommendation is that the

technique fences in money and if used to excess, it would significantly reduce the flexibility of the Secretary of Defense to respond to unforeseen changes in the external threat.

RECOMMENDATION 4 - INCREASED PROGRAM STABILITY.

Program instability is costly in both time and money. It was recommended the Secretary of Defense, his office and the services should fully fund the research and development and procurement of major systems at levels necessary to protect the acquisition schedule established at the time the program is baselined. Limit stretch-outs due to funding constraints except when mandated by Congress.

The advantage of this recommendation is it will reduce cost and save time by stabilizing schedules, quantities, and production rates. It will enhance the ability to plan force modernizations. Budget flexibility will be reduced by this concept and is the main disadvantage.

RECOMMENDATION 5 - ENCOURAGE CAPITAL INVESTMENT TO ENHANCE PRODUCTIVITY

There is no doubt that productivity in the defense section of the United States economy has been lagging, in large part because of low levels of capital investment compared to U. S. manufacturing in general. Cash flow problems, tax policy, high interest rates, and

how return on investment tend to limit available investment capital. The industry views low profits and program instability as precluding investment in capital equipment. This situation has two major implications: a tendency to shift from defense to commercial business and a decrease in funds available for facilitization. The steering committee suggest the encouragement of capital investment thus increasing long term investments which should lead to lower unit costs of systems. Productivity should also be increased.

RECOMMENDATION 6 - BUDGET TO MOST LIKELY COSTS.

Low initial cost estimates are a prime contribution to apparent cost growth. Program costs are sometimes purposely understated either because DOD is forcing a program to fit or because the contractors are purposely lowering their cost estimates in order to win a contract with the hopes of recovering costs on follow on contracts. This is referred to as "buying in" and is defined as the submission of an unrealistically low offer, usually substantially below estimated cost, with the expectation of recovering losses on changed work and/or follow on contracts.²³ The most likely or expected costs, including predictable cost increases due to risk should be budgeted.

The advantage of this concept is there is less cost growth, more realistic long-term defense acquisition budget, and increased program stability. The primary disadvantages are that it is difficult

²³U.S. General Accounting Office, Director, Office and Policy and Special Studies, Glossary for Systems Analysts, 1969.

in determining if a contractor is providing realistic estimates. There is also the political difficulty in rejecting bids that project prices lower than costs.

If the Services are required to budget to most likely or expected costs including predictable cost increases due to risk, instead of the contractually agreed upon cost.

RECOMMENDATION 7 - ECONOMIC PRODUCTION RATES.

The cost and time needed to put a weapon system in the field can be reduced by establishing and sustaining rates of production, for example the rate at which unit cost does not decrease significantly with further rate increases. Tight budgets and strong competition between programs have forced many programs to accept funding levels in the budget which will not sustain an economic rate of production.

A commitment to economic production rates cannot rule out sound arguments for lower (or higher) rates. For example, the Services may wish to stretch a program over a number of years in order to preserve a warm production base to permit rapid mobilization to meet a crisis or war. However, this requires stockpiling of materials, parts and subsystems to be effective.

If the Services use economic production rates in their program and budget requests, or explain and be prepared to defend the reason why a different rate was selected time will be saved and costs

reduced in the acquisition of the new system. This is the main advantage of the economic production rates.

The disadvantage will be this concept will be the shortened production run for a given quantity with peak funding competing with other systems, possible workload fluctuations in certain industries with occasional dead time and possible erosion of the industrial base. This concept may also increase the cost of correcting support problems.

RECOMMENDATION 8 - ASSURE APPROPRIATE CONTRACT TYPE.

As I stated earlier, industry has repeatedly expressed serious concerns about the recurring use of the wrong type of contract. In particular, fixed price contracts are frequently employed for Research, Development, Test and Evaluation (RDT&E) and early production, which have legitimate cost uncertainties. This leads to a high risk situation for the contractors and to cost overruns for the Department of Defense. Current DOD policies and regulations give guidance as to the use of appropriate contract types however, this guidance is not being followed in the field.

If the program managers were given the responsibility to tailor contract types to balance program needs and cost savings with realistic assessment of an acceptable balance of contractor and government risk, this would preclude a company from being forced to assume cost risk beyond their financial ability. It could also increase competition and give the program managers more flexibility to accommodate program

needs. The disadvantage of this recommendation is the Government would be forced to assume more cost risk.

RECOMMENDATION 9 - IMPROVE SYSTEM SUPPORT AND READINESS.

As a result of recurring problems with weapons system support the recent revision of acquisition policies includes a major emphasis on support issues, including reliability, maintenance, spares, test equipment and maintenance manpower.

It was recommended to establish readiness objectives for each development program to include estimates of the readiness level to be achieved at early fielding and at maturity. Implement acquisition policy establishing "designed in" reliability and readiness capabilities. The implementation must emphasize the objectives of shortening the overall time to deliver equipment to the troops which meet mission and readiness needs; the need for improved estimates of the Research and Development and support resources required; and additionally, ask that some force elements be targeted for a major improvement in designed in support capability to be less dependent on a support tail.

Improvement in readiness is a major objective of our national defense. This recommendation is a must and no doubt will require additional technical effort and resources early in acquisition programs. The Services are encouraged to develop implementing guidelines, including procedures for addressing support early in the programs.

RECOMMENDATION 10 - REDUCE THE ADMINISTRATIVE COST AND TIME TO PROCURE.

In 1974, less stringent requirements were established for DOD contract procedures associated with purchases under \$10,000. The purpose was to reduce time and paperwork costs to levels equal to the value of the item being procured. Since then, inflation has reduced the purchasing power of the dollar and \$10,000. in 1974 would be doubled today in terms of money needed to make the same purchases.

If the \$10,000. limit were raised to \$25,000. to accommodate inflation and reduce unnecessary paperwork and review there would be a drastic reduction in paperwork. This would reduce administrative lead time, which would result in reductions in in-house and industry overhead costs. This would support a far more efficient Government cash flow management.

RECOMMENDATION 11 - INCORPORATE THE USE OF BUDGETED FUNDS FOR TECHNOLOGICAL RISK.

Material development and early production programs are subject to uncertainties. Program managers who explicitly request funds to address these uncertainties occur, undesirable funding adjustments are required or the program must be delayed until the formal funding process can respond with additional dollars.

The Army has initiated a Total Risk Assessing Cost Estimate to explicitly address program uncertainties in the development of RDT&E budget estimates. The other Services lack a similar concept to justify reserve funds for dealing with developmental uncertainties.

DOD efforts should be increased to quantify risk and expand the use of budgeted funds to deal with uncertainties. Cost estimates would then be more realistic and programs would be more fully funded and overall programs would be more stable.

RECOMMENDATION 12 - PROVIDE ADEQUATE FRONT END FUNDING FOR TEST HARDWARE.

Weapon system development programs often have too few test articles to allow parallel tests for performance, reliability, etc. and in order to shorten development time without substantially increasing risks. Procurement of too few test articles forces a sequential approach whereby the available test articles are dedicated exclusively to development testing. Consequently, operational and other testing cannot be accomplished concurrently (within acceptable levels of risk) to save time.

In addition to designing for the major performance objectives, increased emphasis should be placed on designing for reliability

by providing adequate design margins, while giving full consideration to adequate testing, fault isolation and maintainability.

Adequate test hardware should be provided in the program to permit early combined environmental tests of the subsystems and subsequent system tests, to allow iteration of the design using the test-fix

test process to achieve early design maturity.

It was recommended that DOD provide sufficient test hardware to meet the subsystem, system and software engineers' needs to properly parallel testing to reduce overall schedule time. This procedure will save time in the total acquisition process by emphasizing reliability up front and eliminating lengthy and costly problem identification and correction efforts. This procedure will however, increase front-end funding.

RECOMMENDATION 13 - GOVERNMENTAL LEGISLATION RELATED TO ACQUISITION.

You must agree that the acquisition process has become overburdened with governmental legislation and requirements. These regulations do have worthwhile objectives, but they impose a costly and burdensome strain on industry and the acquisition process.

If there were less governmental legislation and requirements imposed on acquisition it would cost the contractors less in doing business with the Government. It would furthermore, reduce program costs, simplify the contracting procedure and allow faster awarding of contracts.

RECOMMENDATION 14 - REDUCE THE NUMBER OF DOD OBJECTIVES.

The current acquisition directive refers to 114 related directives and instructions. There is rarely a challenge to these well intentioned directions, nor is there a cost benefit check performed.

Program manager and industry initiatives are often stilted by over-regulation. With each new directive additional paperwork, manhours and other direct costs are raised.

If the number of directives were reduced this will reduce program costs. It is estimated that out of every dollar spent in the acquisition process eight cents is spent on contractually imposed management systems and data requirements.

RECOMMENDATION 15 - FUNDING FLEXIBILITY.

Program continuity requires that we budget for procurement funds more than a year in advance of the actual transition date of major acquisition programs from R&D to procurement. Since most development program schedules are success oriented, sometimes the procurement transition date arrives and the system is not ready to buy. Because funds have been budgeted, there is considerable pressure to proceed with production rather than accept program delays. If the Secretary and/or Military Departments had the authority to transfer these procurement funds to R&D to correct deficiencies without the prior approval of Congress, it would significantly decrease the time involved in resolving program problems. Section 734 of Public Law 96-527 provides a general authority for Transfers, not to exceed \$750 million. In order to Transfer funds it must be determined necessary and that it is in the best National interest. It also must be approved by the Office of Management and Budget (OMB). It was therefore recommended to obtain legislative authority to transfer

individual weapon system Procurement funds to RDT&E. The advantages of this recommendation would be that the DOD would be provided with more flexibility to resolve funding deficiencies and avoid program delays.

RECOMMENDATION 16 - CONTRACTOR INCENTIVES TO IMPROVE RELIABILITY AND SUPPORT.

Industry feels performance and schedule are DOD's principal objectives. There is a need for industry to apply more of their design talents to reducing reliability and support problems. Beyond this a need to improve the identification and specification of maintenance manpower constraints and for industry to include these constraints in the designs.

It was recommended acquisition strategies should identify the approaches to incentivize contractor attainment of reliability and maintainability goals and reduce maintenance manpower and skill levels. These should include the approach taken in the evaluation, as well as specific awards, incentives and guarantees, such as specific rewards for improving reliability. The Services should develop greater expertise in support related contractor incentives through analysis of experience gained on DOD programs.

Improvements should be developed in the method of projecting critical maintenance manpower skill limitations and translating these

into design constraints and objectives for inclusion in specifications. This concept would improve reliability and support plus reduce the maintenance manpower requirements. This has caused large cost

RECOMMENDATION 17 - DECREASE DSARC BRIEFING AND DATA REQUIREMENTS.

In the past there has been an increasing tendency to centralize the decision process within the DOD. This practice alone increases the acquisition cycle, increases costs due to delays in decisions, confuses authority, and has stifled innovation which could produce program improvements leading to cost savings. The principle of decentralization should be applied to acquisition management, and was therefore recommended.

RECOMMENDATION 18 - BUDGETING WEAPONS SYSTEMS FOR INFLATION.

Historically, inflation predictions have been less^{er} than the actual inflation that ^{has} come to pass. The situation has been most severe in major weapon programs that spend out slowly and extend into those years when inflation estimates have been poorest. The result is that unpredicted inflation has cut heavily into real programs by as much as \$6 or \$7 billion a year. It was recommended to review various methods and alternatives for budgeting more realistically for inflation.

RECOMMENDATION 19 - FORECASTING OF BUSINESS BASE CONDITION

The business base at key defense plants is not adequately



considered in DOD program development. Cross-Service impacts and the effects of non-DOD work distorts business base projections and seriously increases overhead costs. This has caused large cost growth for certain systems. Too little consideration is given to this factor in DOD planning and decision-making.

It was recommended the Services increase the effort to coordinate programming information that affects other Service overhead costs at given defense plants. This will result in better cost estimates and lower cost to the government and provides more realistic costs and stability.

RECOMMENDATION 20 - IMPROVE THE SOURCE SELECTION PROCESS.

Some competitively selected contractors have performed poorly. Source selecting sometimes does not take past performance into consideration. Also, the credibility and realism of contractor cost proposals are not always challenged.

It was recommended to place added emphasis on past performance, schedule realism, facilitization plans and cost credibility. De-emphasize the importance of lowest proposed cost. Devote more attention to evaluating contractors' performance during and at the time of contract completion. This will eliminate poor performers, eliminate proposals that are unrealistically priced, thereby reducing the risk of buy-ins. This concept may limit competition and be difficult to implement and apply fairly.



RECOMMENDATION 21 - DEVELOP AND USE STANDARD OPERATIONAL AND SUPPORT SYSTEMS.

New subsystems and support systems are developed that are peculiar to specific systems, yet have many performance features in common with other systems. It is recommended to identify and develop standard subsystems and support systems or their technology to meet projected systems needs. This will result in earlier deployment with lower risk, enhance supportability and reduce operating costs.

RECOMMENDATION 22 - PROVIDE MORE APPROPRIATE DESIGN TO COST GOALS.

Design to Cost fee awards are made as a result of paper analysis. There is little or no tie to actual cost in production. It is recommended to provide appropriate incentives to industry by associating fee awards to actual costs achieved during the early production runs.

RECOMMENDATION 23 - ASSURE IMPLEMENTATION OF ACQUISITION PROCESS DECISIONS.

The acquisition process has been studied many times by many organizations. Most of the recommendations presented here have been made before. However few of these past recommendations have ever been implemented.

Since potential decisions could lead to major changes to the process and even to DOD organizations and their roles, it will be difficult for the existing DOD organizations to execute changes without high level attention. A fundamental determination which

is required for each decision is whether implementation should reflect centralized control under the Office of the Secretary of Defense or decentralization to the Services. In selected areas a uniformity of action across Services may be desired.

It was recommended to ensure that a determined management translates approved recommendations into implementable direction and fixes responsibility so that management has visibility of the action taken. This plan will not succeed without a well planned intensive, high visibility, relentless implementation phase. Without this effort, much time will have been wasted on a hopeless cause.

24. ISSUE A

Issue A is on the Defense Systems Acquisition Review Council Milestones and how they should be reduced to "Requirements Validation" and Program Go Ahead.

25. ISSUE B.

MENS should be submitted with Service POM thus linking the acquisition and Planning Programming and Budgeting Process.

26. ISSUE C.

Defense Systems Acquisition Review Council membership should be revised to include the appropriate Service Secretary or Service Chief.

27. ISSUE D.

The Defense Acquisition Executive should continue to be the

Under Secretary of Defense for Research and Engineering (Formerly Director of Defense Research and Engineering).

28. ISSUE E.

The Criterion for DSARC Review should be increased to \$200million RDT&E and \$1billion procurement in fiscal year 80 budget.

29. ISSUE F.

Integration of the DSARC and PPBS Process will be achieved by requiring that fiscally executable programs be presented for Defense Systems Acquisition Review Council review.

30. ISSUE G.

Logistics and Support Resources will be included in the Service Program Objective Memorandum by weapon system, and Program Managers will be given more control of support resources, funding and execution.

31. ISSUE H.

Improved Reliability and Support for expedited "Fast Track" programs will be achieved by requiring an early decision on the additional resources and incentives needed to balance the risks.

Again, I would like to emphasize the fact that the acquisition process has been studied many times by many organizations. Most of

the recommendations presented by the steering group have been made before. Few of these recommendations however have ever been implemented.

A difficulty with implementing recommendations regarding the acquisition process is the great number of people within and outside of the Department of Defense involved to make implementation succeed. This requires intensive follow-up effort at all levels of management to make sure the recommendations really do take hold.

To insure implementation of the improvements package, Secretary Weinberger assigned the Under-secretary of Defense for Research, Engineering, and Acquisition to follow up on the decisions and to make sure nothing falls between. Progress reports are to be made in the different areas to ascertain implementation of the recommendations.

In a very short period of time, Secretary Weinberger, and Deputy Secretary Carlucci have made the commitment and come up with a plan of action to make major improvements in the Department of Defense acquisition process. To make it happen, not only is full and continuous support by the Services and the Office of the Secretary of Defense staffs necessary but also the support of the Office of Management and Budget, Congress, and industry itself.

There are some critics and skeptics who are saying we've seen all of these recommendations and all of "this" before, it's all "motherhood and platitudes", nothing will change, everything will

BIBLIOGRAPHY

be the same one year from now as it is now or was last year.

That is exactly what they said when President Reagan proposed his economic and tax bills to Congress a few short months ago.

People are still in shock.

3. Acquisition Process for Major Defense Systems, Washington, D. C., 1980.
4. Defense 81, "Big Changes in Systems Acquisition, October 81.
5. Defense 81, "Getting Ourselves Together on Systems Acquisition", October 81.
6. DOD Directive 3010.6, "Standardization of Interoperability of Weapon Systems and Equipment within the North Atlantic Treaty", March 5, 1980.
7. DOD Directive 3025.1 Department of Defense Directives System, Nov. 78.
8. DOD Directive 3000.19, "Policies for the Management and Control of Information Requirements", March 12, 1979.
9. DOD Instruction 3000.2, "Major Systems Acquisition Procedures", Mar. 80.
10. Engoron, El J., and Jackson, Albert L., Jr., "Configuration Management", Defense Management Journal, Fall 80.
11. Farnsworth, John L., Farnsworth's Progress and Dictionary, Sun Valley, 110900 Country St., CA., 1980.
12. Goss, William K. and Lockwood, Iyle N., "Acquisition Production Management Tasks: A Program Office/AFMOP Separation of Relative Task Size and Priority", Unpublished Master's Thesis, Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio, August, 1975.
13. Martin, Martin B., Barnaby, Jack A. and Swanson, Kenneth J., "An Investigation of Negative Pre-award Surveys as an Indicator of a Contractor's Inability to Meet a Delivery Schedule". Proceedings of the Fourth Annual Department of Defense Procurement Research Symposium, United States Air Force Academy, Colorado, Oct. 1975.
14. Joint Memorandum of Jan 14, 1977, from the Principal Deputy Director of DDM and Principal Deputy Assistant Secretary of Defense to the Assistant Secretaries of the Military Departments, Subject: Commercial Commodity Acquisition Program.

BIBLIOGRAPHY

1. Adams, John R. and Barndt, Stephen E., "Organizational Life Cycle Implications for Major R&D Projects", National Academy of Management Symposium, San Francisco, California, August 1978.
2. Brooks, Dwight C., Manager Purchasing Administration, Burroughs Corp., Detroit, Mich., 1969.
3. Booz, Alan R., Acquisition Process for Major Defense Systems, Washington, D. C., 1980.
4. Defense 81, "Big Changes in Systems Acquisition, October 81.
5. Defense 81, "Getting Ourselves Together on Systems Acquisition", October 81.
6. DOD Directive 2010.6, "Standardization of Interoperability of Weapon Systems and Equipment within the North Atlantic Treaty", March 5, 1980.
7. DOD Directive 5025.1 Department of Defense Directives System, Nov. 77.
8. DOD Directive 5000.19, "Policies for the Management and Control of Information Requirements", March 12, 1976.
9. DOD Instruction 5000.2, "Major Systems Acquisition Procedures", Mar. 80.
10. Engoron, Ed J., and Jackson, Albert L., Jr., "Configuration Management", Defense Management Journal, Fall 68.
11. Farnsworth, John L., Farnsworth's Procurement Dictionary, Sun Valley, 110900 Contlay St., CA., 1960.
12. Goss, William K. and Lockwood, Lyle W., "Acquisition Production Management Tasks: A Program Office/AFPRO Comparison of Relative Task Size and Priority", Unpublished Master's thesis, Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio, August, 1975.
13. Martin, Martin D., Barnaby, Jack A. and Bohannon, Kenneth J., "An Investigation of Negative Pre-award Surveys as an Indicator of a Contractor's Inability to Meet a Delivery Schedule". Proceedings of the Fourth Annual Department of Defense Procurement Research Symposium., United States Air Force Academy, Colorado, Oct. 1975.
14. Joint Memorandum of Jan 14, 1977, from the Principal Deputy Director of DDR&E and Principal Deputy Assistant Secretary of Defense to the Assistant Secretaries of the Military Departments, Subject: Commercial Commodity Acquisition Program.

15. "Major Systems Acquisitions: A Discussion of the Application of OMB Circular No. A-109," CFPP Pamphlet No. 1, Washington D. D., Office of Federal Procurement Policy, Office of Management and Budget, August 1976.
16. McDonald, Paul R., Government Prime Contracts and Subcontracts, Procurement Association, Glendora, CA. 1964.
17. Newman, W. H. and J. P. Logan, Strategy, Policy and Central Management, 6th ed., Cincinnati, South-Western Publishing Co., 1971.
18. OMB Circular A-10.
19. OMB Circular A-76.
20. OMB Circular A-109.
21. Patterson, Michael B., "Government-Contractor Adversarial Relationships," Defense Management Journal, July 1977.
22. Presidential Memorandum #0810580, 17 March 81.
23. Public Law 96-527, Section 734, Department of Defense Acquisition Act.
24. Purchasing, "Purchasing-Partner in Modern Management", May 72.
25. Report of the Commission on Government Procurement, December 1972, Volume 3, Part D, "Acquisition of Commercial Products".
26. S. 1264, the "Federal Acquisition Act of 1978" introduced by Senator Chiles.
27. Smythe, Ralph E. and McMullen, William J., "An Evaluation of the Major Qualifications Desired of Air Force System Program Managers", Unpublished Master's thesis, Air Force Institute of Technology, Wright-Patterson AFB, Ohio, January, 1975.
28. Thompson, Charles W., Design and Procurement of Evaluation Systems, In Proceedings of the 1976 International Conference on Procurement and Grants Management, Charlottesville, VA: University of Virginia, April, 1976.
29. Thompson, Charles W., "Evaluation System Proposal Preparation and Evaluation Procedure," Final Report, NBSIR 76-1124. Washington, D. C., Office of Experimental Technology Incentives Program, National Bureau of Standards, February, 1976.
30. United States Commission of Government Procurement, Report of the Commission, Vol 2, Part C, Dec. 72.

31. U. S. Department of Defense, Departments of the Army, Navy, and Air Forces, Configuration Management, AR70-37 NAUMAT, INST 4130, AFR64-3, 1974.
32. U. S. Department of Defense, Department of Defense Directive 500.3, Test and Evaluation, Washington, D. C., 26 Dec. 79.
33. U. S. Department of the Air Force, HQ Air Force Logistics Command, Acquisition Management, Standard Integrated Support Management, Systems AFLC?AFSCR 800-24, Wright Patterson Air Force Base, 1977.
34. U. S. General Accounting Office, Director, Office and Policy and Special Studies, Glossary for Systems Analysts, 1969.
35. Weiss, Roland G., and Thompson, Charles W., "Improving the Likelihood of Implementing Program Results", Draft paper, Washington, D. C., Center for Field Methods, National Bureau of Standards, Apr. 78.