STUDY PROJECT

HOW CAN RESEARCH AND DEVELOPMENT LEADTIME BE REDUCED?

BY

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Recognizing that the country that can rapidly convert advanced technology into superior weapon systems has a marked advantage, we have continuously increased funding of Research, Development, and Acquisition programs over the last three decades. During this period the leadtime for the development of new equipment has tripled. During the 1960's the stated leadtime objective of the Army was four years or less from initiation of development effort to type classification of the system as standard. This goal was never reached within the Army, instead the acquisition cycle leadtime has grown to ten to fifteen

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AN INDIVIDUAL STUDY PROJECT

by

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ABSTRACT

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Recognizing that the country that can rapidly convert advanced technology into superior weapon systems has a marked advantage, we have continuously increased funding of Research, Development, and Acquisition programs over the last three decades. During this period the leadtime for the development of new equipment has tripled. During the 1960's the stated leadtime objective of the Army was four years or less from initiation of development effort to type classification of the system as standard. This goal was never reached within the Army, instead the acquisition cycle leadtime has grown to ten to fifteen years. As a result of these long leadtimes many of our weapon systems cost too much and have obsolete technology by the time they are fielded. In addition to the premise that any reduction in leadtime means cost savings and a more qualitative combat force for the Army, why is it essential now that we minimize leadtime? The prominent reason is that the military budget will no doubt be significantly reduced due to the changing political environment of the world. Preparing and executing a modernization plan that supports our national security strategy for the present and the future will become complicated by the need for fiscal restraint. We must be careful to ensure that these constraints do not increase the leadtime of RD&A programs even more by stretching out the acquisition cycle. With this as a premise, it is the purpose of this study to address the following two questions in regards to leadtime: What are the problems that cause long leadtimes? And what changes would be required to shorten the leadtime of the Weapons System Development Cycle?

TABLE OF CONTENTS

HOW CAN RESEARCH AND DEVELOPMENT LEADTIME BE REDUCED?

CHAPTER I

INTRODUCTION

Research, Development, and Acquisition (RD&A) programs are vitally important to our national defense and military strategy. They provide the key to the modernization of our forces, and they help ensure that the United States maintains a qualitative advantage over potential adversaries. Recognizing that the country that can rapidly convert technological advances into superior weapon systems has a marked advantage, we have continuously increased funding of RD&A programs over the last three decades, especially during the 1980s. During this period of abundant defense budget spending, the leadtime (measured from the time that a new equipment concept is proven technically feasible until developed and produced as a system for operations in the field) for the development of new equipment has managed to almost triple.

During the 1960's the stated leadtime objective of the Army was four (4) years or less from initiation of development effort to type classification of the item or system as standard.[1] This goal, generally recognized as an acceptable goal, was never reached within the Army except in a very few isolated instances.

Instead, because of the bureaucratic and over regulated management environment that has evolved over the last three decades, the acquisition cycle for new systems has grown to ten to fifteen years. As a result of these extremely long leadtimes many weapon systems cost too much and have obsolete technology by the time they are finally fielded. With this as a premise, it is the purpose of this study to address the following two questions in regards to leadtime: What are the problems that cause long leadtime? And, what changes would be required to shorten the leadtime of the Weapons System Development Cycle?

To set the stage to answer the two key questions concerning leadtime, I will briefly describe the environment of the research and development process (Standard Acquisition Cycle), and I will discuss several RD&A programs with long leadtimes. Then, I will discuss why it is necessary now to reduce leadtime, problems that contribute to increasing leadtime, and some plausible methods to reduce leadtime. Finally, I will discuss how the acquisition leadtime of the Mobile Subscriber Equipment Program was significantly reduced in comparison to the Standard Acquisition Cycle.

ACQUISITION PROCESS

Department of Defense Directive 5000.1 (Major and Non-Major Defense Acquisitions Programs Acquisitions) and Army Regulation 70-1[2] (Systems Acquisition Policy and Procedures) describe four key decisions and four phases of activity in the Department of Defense (DoD) Major Systems Acquisition process:

- Milestone 0 Decision: Approval or disapproval of a mission need and entry into concept exploration and/or definition phase.

- Phase 0: Concept exploration solicitation and evaluation of alternative system design concepts.

This is the thinking stage, a period of developing requirements for the program. This stage generally averages about 2 years.

- Milestone I Decision: Approval or disapproval to proceed into the concept demonstration and/or validation phase. This is the stage in which ASARC's (Army Systems Acquisition Review Council) are conducted to determine if the program is justified. Several ASARC's are held before the Program goes to the Defense Acquisition Board for review.

- Phase I: Demonstration and Validation. During this stage contractor furnished prototypes are demonstrated, performance trade-offs are negotiated, risks are evaluated and P^3I (Pre-planned Product Improvements) technical advances are planned. This stage averages 2 to 3 years.

- Milestone II Decision: Approval or disapproval to proceed into the full scale development phase and, as appropriate, low rate initial productions.

- Phase II: Full scale development. During this phase, in addition to initial low rate production, managers look at the risks of the system compared to the benefits and costs, and they start to develop the logistical support required to field and sustain the system. This stage averages 3 to 6 years.

- Milestone III Decision: Approval or disapproval to proceed into the full-rate production and initial deployment phase.

Milestone IIIA: Low Rate Production. During this stage a review is conducted on program costs and scheduling to determine if the program is ready to go into full rate production.

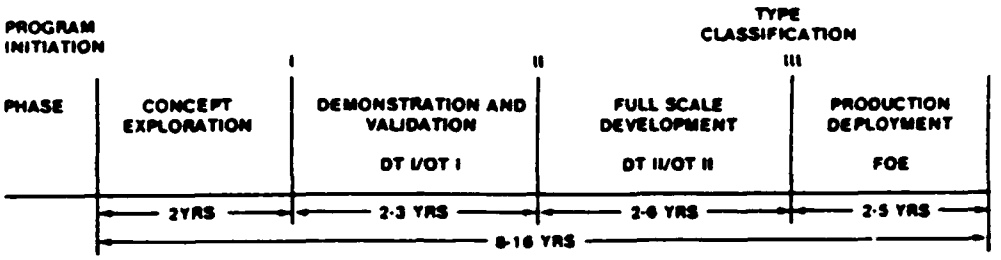
Milestone IIIB: Full Rate Production.

- Phase III: Production and initial deployment. Upon approval to go into full rate production, facilities and sites are activated, product improvements are incorporated into production, sustaining rate production numbers are set, spares are initiated, and a FUE (First Unit Equipped - date the first Army unit issued new equipment) and IOC (Initial Operational Capability - attainment by a MTO&E unit to employ the system effectively to Army Testing and Evaluation Standards) are set and met. This phase generally takes 3 to 5 years to accomplish.

- Milestone IV Decision: Encompasses a review 1 to 2 years after initial deployment to ensure that operational readiness and support objectives are being achieved and maintained during the first several years of the operation support phase.[3]

The following chart shows a standard DoD acquisition cycle:

STANDARD LIFE CYCLE



The intent of this process is to ensure that weapon systems being developed and fielded fall within the parameters of DoD Modernization Plans that include a long-term Battlefield Functional Mission Area Plan for force modernization within constrained fiscal and force structure resources. Specifically, this process focuses on providing holistic warfighting capabilities to solve identified deficiencies, exploit opportunities, and avoid obsolescence.

This process is lengthy, detailed, and loaded with reviews and testing to ensure that what the DoD acquires will work. The process also includes procedures that ensure that the new systems can be mass produced and that all subsystems can be successfully integrated with existing systems. During this process the programs must be continually validated to ensure that the threat or need that the new systems are designed to meet are still valid. These demanding procedures, as previously stated, have caused the acquisition cycle to grow to ten to fifteen years

for our major systems. This is just too long considering how fast technology is advancing today, and how fast our defense budget may shrink.

SYSTEMS WITH LONG LEADTIMES

One example of a major system that has taken much to long to develop and field is the SINCGARS (Single Channel Ground and Airborne Radio System), a radio system intended to replace the tactical AN/VRC-12 radio series. The AN/VRC-12 radio series was fielded in the early 1960s, has antiquated technology, and is no longer economically supportable because of nonexistent manufacturing and repair parts contracts. To say that we need the SINCGARS right now to replace the outdated AN/VRC-12 tactical radio series would be an understatement.

I first heard about SINCGARS in 1966 while attending the Signal Officer Candidate School at Fort Gordon, and again in 1969 while serving as the Commandant of the Radio Operators Course at Fort Dix. While serving as the Communications-Electronics Staff Officer in 1972 for the 2d Brigade, 1st Infantry Division, I received a questionnaire from the U.S. Army Southeastern Signal School asking me what technical characteristics I would like to see included in the design of the new SINCGARS. Since then I have served continuously in tactical communications assignments and in each position I have seen the immediate need for SINCGARS. However, according to Mr. John Perrapato, the Deputy Project Manager (PM) for SINCGARS, it is doubtful that I will see the equipment in use within my career because of the delays that have

occurred during its Research, Development, and Acquisition Process.[4]

According to Mr. Perrapato, a study group was formed in 1970 to develop the need/requirement for SINCGARS (similar to the Mission Area Analysis required today). In 1974 the requirements or Required Operational Capabilities (ROC) and Cost Effectiveness Analysis were approved. A Project Management Office was formed in 1977 under the U.S. Army Electronics Command (now CECOM, U.S. Army Communications-Electronics Command). A Defense Acquisition Review Council (DSARC) approved advanced development in 1978 and limited production of SINCGARS without a Communications Security (COMSEC) capability finally began in 1982. This contract was changed in 1984 to add a COMSEC capability (COMSEC was an additional piece of equipment that was not integrated into the SINCGARS). Since then there have been numerous development and prototype testing problems pertaining to the radio meeting the maintenance standards and the desired frequency hoping capabilities of the ROC. Finally, in 1989 Milestone IIIB approval was obtained to proceed into the full rate production and initial deployment phase of the non-integrated COMSEC model of SINCGARS. This achievement was quickly overshadowed by a second Milestone IIIB approval to start production of the new SINCGARS Integrated COMSEC (ICOM) radio in 1990, and a third Milestone IIIB approval for a second source production contract in 1991. Production of the total objective of 350,000 SINCGARS is programmed over 15 years and is scheduled to be completed by the year 2006.[5]

The following chart highlights the long leadtime required in the acquisition of SINCGARS:

SINCGARS PROGRAM DEVELOPMENT

YEAR	EVENT
1970	Study Group formed
1974	ROC and CEA Approved
1977	PM SINCGARS formed
1978	DSARC Approved Advance Development
1982	Limited Production W/O COMSEC began
1984	Contract changed to add COMSEC capability
1989	Milestone IIIB Approved - Full Rate Production
1990	New Milestone IIIB for Integrated COMSEC
1991	Second Source production Contract
2006	Projected Production Completion

20+ Years Total

SINCGARS is just one example of a badly needed new system that has taken much too long to develop and field. The following chart displays the time spent on developing other recent systems.[6] The leadtime required for these urgently needed weapon systems ranged from eleven (11) to eighteen (18) years.

	MILESTONE				
SYSTEM	0	I	II	III	TOTAL YEARS
Phalanx	6.6	5.5	1.5	1.7	15+
Sea Launched Cruise Missile	3.7	3.9	4+	1.5	12+
Patriot	5.0	4.5	8+	4.0	18
A-10	4.5	2.0	3+	1.7	11+

In looking at the development program of the hottest new weapon system in the Army, the Light Helicopter (LHX Program), the following chart indicates that the leadtime is anticipated to be just as long or even longer if problems are encountered:[7]

LHX PROGRAM DEVELOPMENT

YEAR	EVENT
1982	Army Aviation Mission Area Analysis Completed
1983	Justification for Major Systems New Start Approved
1984	Rotorcraft Technical Integration Contract Awarded
1986	Risk Reduction Contract Awarded
1987	Cost Estimate Analysis Studies Conducted
1988	Milestone I approved, Competitive Demonstration and Validation Contracts Awarded
1991	Milestone II (projected)
1995	Milestone IIIA (projected)
1997	Milestone IIIB (projected)

15+ Years Total

The LHX program is one of the most important RD&A efforts in the Army today. The LHX is the Army's next generation rotorcraft which will replace the aging unarmed scouts and AH-1 attack helicopters. This aircraft will significantly expand the Army's cavalry and attack units capability to conduct tactical operations in all types of terrain, adverse weather and battle environment, during day/night operations with increased survivability. The LHX with its increased speed, survivability, air-to-air capability and mission equipment will enhance the combat operations of supported forces and forward deployed forces by conducting both close and deep operations with improved lethality and survivability. The LHX will be able to perform the

missions currently being performed by three types of helicopters (AH-1, OH-58, and OH-6) better and with greater operational and support efficiency. This new weapon system is one that is direly needed. According to the DCSOPS of the Army, LTG Sullivan, this program will be protected for the future of the Army regardless of proposed budget cuts.[8] Yet, even though this is one of the most important RD&A efforts in the Army, soldiers in the field will not see the LHX until late in the 1990s because of the problems in the present acquisition cycle that cause long leadtimes.

ENDNOTES

1. U.S. Department of the Army. Army Regulation 705-5: Research and Development of Materiel, 14 Jan 1963, p. 2.

2. U.S. Department of the Army. Army Regulation 70-1: Systems Acquisition Policy and Procedures. 12 November 1986, p. 28.

3. DODD 5000.1: Major and Non-Major Defense Acquisition Programs Acquisitions (USDA), 1 September 1987, pp. 1-3.

4. John Perrapato, GM-15. Deputy Project Manager for SINCGARS, Fort Monmouth, New Jersey. Interview. 8 February 1990.

5. Ibid.

6. General Accounting Office, GAO/PSAD/GP, 27 May 1980, pp. 6-8.

7. Colonel Steve MacWillie, The Role of the TRADOC System Manager. Lecture. Carlisle Barracks: U.S. Army War College, 22 January 1990.

8. "LHX (Light Helicopter)." 1989 Weapon Systems, United States Army, 15 January 1989, p. 7.

CHAPTER II

WHY REDUCE LEADTIME NOW?

BACKGROUND

For 40 years, the U.S. national security policy has been predicated on credible deterrence of nuclear and non-nuclear war with the Soviet Union and its allies. Underlying this has been the realization that only through qualitative superiority can we deter attack, or defeat it if deterrence failed. As a consequence, this county established a unique process for supplying our troops with the best equipment that could be made available. Thirty to forty years ago, this process - that integrated scientific discoveries, technological inventions, and understanding of military operations - functioned well and produced extraordinary weapons systems. This process was a comfort to our allies and the envy of our adversaries.[1]

However, over the last three decades, we have seen a gradual weakening of our marvelous acquisition process. The change was imperceptible at first and so gradual that the seriousness of the change is only barely apparent now. We are seeing a steady erosion of the commitment to qualitative superiority. We have seen declining funding for defense technology, reduced willingness to take calculated risks to advance the state of the art, and a dramatic increase in the leadtime required to develop and field quality systems. These trends must be reversed if qualitative superiority is to be saved.[2]

A REDUCED DEFENSE BUDGET DUE TO A CHANGING POLITICAL ENVIRONMENT

In addition to the premise that any reduction in leadtime means cost savings and a more qualitative combat force for the Army, why is it essential now that we minimize leadtime? The prominent reason is that the military budget will no doubt be significantly reduced due to the changing political environment of the world. Evolving democratic movements in Eastern Europe and the Soviet Union are changing our view of the world and the threat to peace that has existed since the end of World War II. Many see this political upheaval as an end to the cold war and reason to reduce the large standing Army that the United States now has. This is generating considerable political pressure within Congress to reduce the military budget.[3]

The cracking of the communist East bloc has opened a path to profound change in U.S. defense policy. The fallout for military leaders, weapons makers, politicians and taxpayers is emerging. A revolution in military affairs could be in the making, says William Kaufmann of the Brookings Institution think tank and a frequent consultant to the Pentagon. The precise features of this transformation are fuzzy but the direction is clear: smaller Pentagon budgets, fewer troops and a shrinking pipeline of new weapons. The most frequently asked questions now are how radically will the military be reshaped, and will Congress switch defense dollars to social programs such as housing and education that were squeezed during the Reagan administration's military buildup of the 1980s?[4]

Military planners already are rethinking traditional defense strategies since few now believe the fractured Warsaw Pact armies pose a major threat to Western security. For four decades, the primary concern of the North Atlantic Treaty Organization (NATO) has been to deter a Soviet led attack on Western Europe. Now, instead of an invasion of troops moving from East to West, the ideas and institutions of freedom are moving from the West to the East.[5]

While even the Pentagon's biggest supporters in Congress see more relaxed East-West relations, some caution against assuming that democratic reforms and moves toward free-market economies in Eastern Europe would last if Soviet President Mikhail S. Gorbachev was ousted. As Senator Warner of Virginia, the ranking Republican on the Senate Armed Services Committee, recently stated, "A return to past Soviet behavior is the biggest risk we must consider in reordering our priorities and restructuring our defenses".[6] And, although the changes begun in the Soviet Union and Eastern Europe are welcome, Soviet armed forces remain the most serious threat to the United States and its allies. Developments elsewhere in the world also pose continuing challenges to our security. Instability resulting from economic pressures throughout the world, weapons proliferation, insurgencies, terrorism, and drug trafficking all threaten U.S. interests.

This era of tremendous uncertainty demands a carefully designed, flexible strategy. The United States must be dynamic and imaginative in responding to opportunities, but it also must

be cautious. It must maintain defenses that are capable of deterring and, if necessary, responding to an increasing range of potential threats to its security. To this end the Administration's defense budget priorities remain clear. To perform its national security mission and effectively execute the national strategy, the Department of Defense needs:

- o High-quality people;
- o Ready and sustainable forces;
- o Modern strategic forces; and
- o Efficient acquisition of weapons and equipment.[7]

Obtaining and maintaining these essentials are complex tasks in a fiscally constrained environment. The new world order means running a new-look U.S. military on less money - perhaps a lot less. For example, the Secretary of Defense, Dick Cheney, has already stated that he wants the military services to trim $180 billion from their RD&A "wish lists" over the years 1992 - 1996.[8] And President Bush has proposed to Congress a trimming of $2.6 billion from defense spending for the FY 91.

Pressures are great on Capitol Hill to wield an even heavier ax to feduce significantly the defense budget, some believe by as much as half by 1999. In response to these comments, General Colin L. Powell, the Chairman of the Joint Chiefs of Staff, has stated that "the reality is that we must plan on our defense budget going down several percentage points every year for the foreseeable future".[9]

Preparing and executing a modernization plan that supports our national security strategy for the present and the future

will become complicated by the need for fiscal restraint. We must be careful to ensure that these constraints do not increase the leadtime of RD&A programs even more by stretching out the acquisition cycle. For instance, according to the former director of the Congressional Budget Office, Rudolph G. Penner, we have been cutting defense spending over the past few years, but we have been doing so without really changing defense policy in any fundamental sense. "A large part of the savings have come from just stretching out the purchase of weapons, and that's been very inefficient and has raised the unit costs of individual weapons. We engage in a lot of procurement delays as opposed to cancellations, and we really need cancellations."[10]

Following this premise President Bush's proposed defense budget for 1991 includes the termination of 13 RD&A programs (weapon systems).[11] Even though most of the proposed weapon cuts are directed at systems that are behind schedule or overpriced, the services still see these systems as needed for future defense plans. Some of the weapons systems proposed for deletion include the Marine Corp's V-22 Osprey tilt-prop transport craft, the Navy's F-14D Tomcat fighter, and the Army's Helicopter Improvement Program.[12] These are significant proposals by the Department of Defense to reduce defense spending, and based on the estimates of the current threat their elimination may be appropriate at this time.

However, cancellation of programs also means stopping research and development of new technology, something we do not want to do. In order to maintain a quality advantage over our

adversaries we must continue to pursue technological advances that improve our defense capabilities and the readiness of our forces. Unless we are willing to choose now which additional RD&A programs to eliminate just to reduce defense spending, it is essential that we reduce leadtime (reducing leadtime means cost savings) in order to continue modernization.

ENDNOTES

1. Technology for National Security. Report by the Working Group on Technology, submitted to the Commission on Integrated Long-Term Strategy. Washington: U.S. Department of Defense, October 1988.

2. Ibid.

3. John Walcott, "Does America Need an Army?" U.S. News & World Report, 11 December 1989, p. 35.

4. Robert Burns, "Fallout for U.S. defense just coming into view." Patriot-News (Harrisburg), 4 February 1990, p. D1.

5. Dick Cheney, Annual Report of the Secretary of Defense to the President and the Congress, January 1990, p. ix.

6. Burns, p. D1.

7. Cheney, p. ix.

8. Les Aspin, "Budget for Defense in a Whirlwind." House Committee on Armed Services before the National Strategy Forum, 19 January 1990, p. 6.

9. Burns, p. D1.

10. Paul Blustein and John M. Berry, "Deep Pentagon Cuts Could Boost Economy's Fortunes." Washington Post, 22 November 1989, p. E1.

11. Andy Pasztor and John E. Yang, "Expensive Arms Excluded from Cuts in U.S. Defense." Washington Post, 21 January 1990, p. A5.

12. Moly Moore, "Troops, Arms Cut Modestly; Strategic Spending Up." Washington Post, 30 January 1990, p. A4.

CHAPTER III

PROBLEMS THAT INCREASE LEADTIME

REQUIREMENTS

Problems with the present defense acquisition system begin with the establishment of approved "military requirements" for a new piece of equipment or weapon, a step that occurs before development starts. Two methods exist for establishing the need for a new system ("user pull" and "technology push"), and both methods are unsatisfactory because they result in overstated requirements.

The user pull method defines the process by which the military services assess the adequacy of existing weapons to meet their needs, and define the characteristics of the next generation of equipment desired to overcome the inadequacies identified. This process does not adequately involve participants with a sophisticated knowledge of the cost and schedule implications of technical improvements required to satisfy these characteristics. As a result the user pull method often leads to what is termed "goldplating", the inclusion of features that are desirable but whose cost far exceeds their real value, and whose technical requirements may far exceed that needed to perform the required function.

The second method, technology push, is a situation where a government or industry team outside the military service develops a new technology and then tries to push the services to state requirements for new systems that exploit the new technology.

Because the developers of the new technology are pushing it for its own sake, the technology push method of establishing requirements is no less prone to result in goldplating than the user pull method.[1]

SPECIFICATIONS

From the requirements stated for the desired new weapon or equipment system, a DoD program team is given the task of preparing detailed specifications. Since we want only the best equipment, technical specifications for a new weapon or piece of equipment generally consists of thousands of pages and become the surrogate for the overstated requirements. The DoD then invites private industrial enterprises to bid competitively on the program to develop the new system. The overly detailed technical specifications serve as a basis for industry to prepare proposals describing how they would meet the specifications, and at what cost to them and price to the government. This environment encourages industry to make competitive bids that contain suggested improvements within specifications to reduce costs, but the same environment also discourages competitors from proposing improvements that deviate from the specifications for fear of not meeting the user's wants. This method of competition is based principally on cost and all too often the contract for the development of the new system goes to the contractor whose bid is the most optimistic, and generally underestimated.

The contract is awarded and the program for the development of a new weapon system or piece of equipment is launched. But

because of the environment of the initial acquisition process, this new program is going to be an improbable task to accomplish since it starts too underfunded to bring the overspecified program to a successful conclusion.[2]

INTEREST GROUP INVOLVEMENT

In the management of his program, the program manager is only one of the participants who can influence the program. Numerous special interest advocates are involved with the program to ensure that it complies with the standards established for military specifications, operability, reliability, maintainability, small and minority business utilization, and competition, just to name a few. Each of these special interest advocates can demand that the program manager take or refrain from taking some action in the development, testing, and production of the new weapon or piece of equipment. However, none of these special interest advocates have any responsibility for the ultimate cost, schedule, or end performance of the program. None of the purposes they advocate are undesirable in themselves, but in the aggregate, they also do not provide the program manager much latitude to balance their many demands. In other words, the program manager is required to react to their guidance, some of which may conflict with guidance from another special interest group, and most of it which conflicts with the program's cost and schedule objectives.

Throughout this entire RD&A process, various Congressional committees are involved with the program. During the marketing

phase, it is not enough that the program manager has to sell his program to his service leaders and the various staffs in the Office of the Secretary of Defense, but he must also sell it to at least four committees and numerous subcommittees, and then rejustify it each fiscal year for continued funding. During this time, the program manager is either assisted or opposed by a variety of contractors who are advocating their own views of the program on Capital Hill. While Congress has an interest in greater program effectiveness, it also has intense parochial interest in member constituencies which can lead to pork barrel spending. Pork barrel spending goes to the heart of the age-old dilemma caused by a lawmaker's dual role as representative of a particular area and member of a national legislative body. In the former capacity, the task is to promote the local interest of his constituents; in the latter it is to weight the national interest. For many Congressmen, that means that pork barrel spending is a primary responsibility. These two conflicting interests exert pressure on new programs through legislative oversight.[3] This particular problem will be even more in focus as Congressmen face the possibility of reduced government spending in their areas due to defense budget reductions.

ENDNOTES

1. "A Quest for Excellence", Final Report to the President by the President's Blue Ribbon Commission on Defense Management, January 1986, p. 45.

2. Ibid., p. 46.

3. Ibid., p. 47.

CHAPTER IV

CHANGE REQUIRED TO REDUCE LEADTIME

All the pressures and problems discussed in Chapter III contribute to a management environment that leads to an unreasonably long acquisition cycle. So how can it be improved?

PACKARD COMMISSION

According to the 1986 Packard Commission Report[1], chances for meaningful improvement will come not from more regulation but only from major institutional change. The Packard Commission pointed out three typical hazards with the DoD acquisition process:

1. The process is too lengthy and this leads to unnecessarily high costs of development. Time is money, and a ten year development cycle is clearly more expensive than a five year cycle.

2. A lengthy process leads to obsolete technology by the time a new system is fielded.

3. Users, knowing that the new equipment designed to meet their requirements is fifteen plus years away from fielding, make extremely conservative threat estimates. Because long-term estimates are uncertain at best, users tend to make errors on the side of overstating the threat.

The Packard Commission also declared that the quest to reduce the leadtime in the development and fielding of new systems to modernize our services will be successful only if a

new management philosophy can replace the old. Instead of concentrating on the things that are being done wrong and trying to fix them with more tests and inspectors or with more laws and regulations, the Commission recommended that the DoD should concentrate on those things that are done right and adapt to the new theory of management that has evolved and flourished in the last decade in many U.S. and Japanese commercial companies. The new management philosophy, called Total Quality Management (TQM), involves the participation of all the people in the organization in deciding among themselves how the job can best be done, or "doing what is right in a timely manner". Total Quality Management philosophy involves, above all, trust in people. This style reinforces the belief that people want to do a good job, and that they will if given the opportunity, all contribute their knowledge, skill, and enthusiasm to work together to achieve the aims and goals of their organization. In this respect, supervision can be minimized, and detailed review of work can be greatly reduced. The use of this new management philosophy has resulted in much higher productivity of much higher quality products in a much shorter period of time. It is this theory of management that we must progress toward if we are to shorten the leadtime for properly equipping and modernizing our Army.[2]

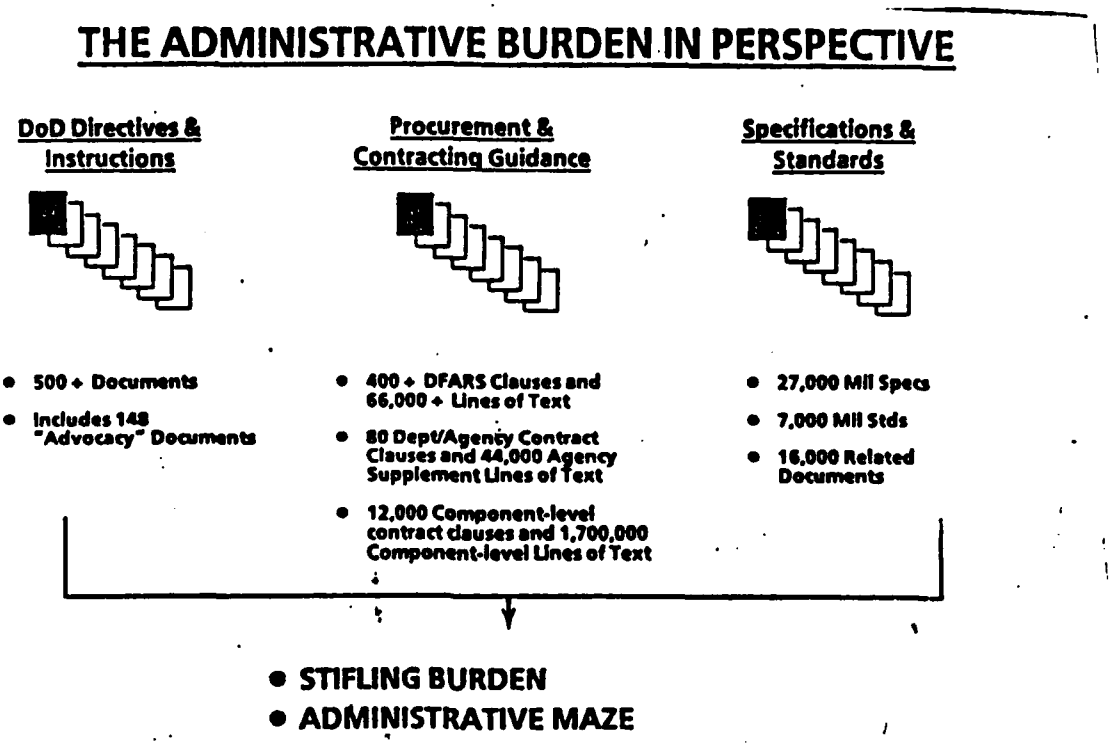
To address whether the new management practices would work in a military acquisition environment, the Packard Commission Acquisition Task Force examined several DoD programs that were developed under special streamlined procedures similar to those found in the successful commercial company programs employing the

new management theories. These programs included the Polaris missile, the Minuteman missile, the air-launched cruise missile (ACLM), and several classified programs. The Task Force found that these programs achieved the same accelerated schedule as the successful commercial programs.

Major cost and time savings are possible according to the Packard Commission if the DoD broadly emulates the acquisition management procedures used in outstanding commercial programs. This means that DoD acquisition programs must adapt management features that provide clear command channels for the Program Manager; that provides strong management support and stability throughout the life of the program as long as the program is within the performance, schedule, and cost boundaries of its contract; that establishes limited reporting requirements (management by exception) for the Program Manager that truly places him, and his co-workers in charge and responsible for the program; that allows the Program Manager to select a relatively small but high quality staff to efficiently manage the program; that provides the Program Manager and his staff the unrestrained opportunity to communicate directly with the user at the conception of the program and throughout its life to address problems and coordinate trade-offs in order to protect cost and time schedules; and that provides for a more efficient and timely application of prototype and operational tests. The important point is that the acquisition organization and procedures must be streamlined to reduce the numerous layers of supervision and tons of administrative requirements that currently contribute to the

extremely long leadtime of weapons system development.

The following chart provides an example of the cumbersome administrative requirements that managers have to deal with in executing their programs:



To reduce leadtime we need to reduce the self-imposed burden. In short, we need to restructure/revise current administrative requirements in order to provide program managers relief from this stifling burden.

REDUCING TECHNICAL REQUIREMENTS

In addition to reducing the administrative burden and revamping the DoD military acquisition programs to incorporate the successful management practices used in private industry, there are other initiatives the DoD could adopt to reduce the

leadtime of the weapon systems development cycle. The first initiative pertains to reducing technical requirements. I have stated in Chapter III that the present system provides technical requirements that are vastly overstated. Nearly everything the DoD buys, from submarines to fruitcakes, is circumscribed down to the last bolt and walnut by so-called military specifications. For example, the fruitcake specifications ran 18 pages.[3]

Overstated specifications not only increase leadtime and the cost of a system, but they contribute to the acquisition of outdated technology. For instance, a series of studies by the Defense Science Boards recently found that the DoD buys electronics that are often five to ten years behind the state-of-the-art technology and up to eight times more expensive. The semi-conductors mounted on car engines, for example, are as rugged as the chips on the F-16 jet fighters; they also are easier to acquire, more reliable, and cost a lot less.[4] The congressional Office of Technology Assessment has noted that the very process of writing military specifications ensures these differences. By the time overstated specifications are written for an emerging technology such as optical fibers, the technology will already have significantly advanced. In addition, a 1988 report from the Pentagon's Acquisition Office indicates overstated specifications often create bizarre barriers that block industries from incorporating the latest technological advances.[5] For example, the nations's leading maker of ammunition for shotguns produces 240 rounds a minute on its commercial line, but only 60 rounds a minute on its military

line. The reason for this significant difference is that the military specifications and DoD regulations require that the military line use a dozen outmoded machines, each operated by one person and monitored by a 24 machine quality-control system. On the civilian line, one person supervises three modern and faster producing machines.[6]

In addition to overstated specifications, excessive oversight of production lines to ensure compliance to these exacting specifications also increases leadtime. For instance, for every civilian engineer on the military helicopter engine production line, there also is a DoD auditor and inspector slowing the line down to check and recheck equipment against specifications. In contrast, no one from the airline or airframe industries monitors the commercial production line.[7] This cumbersome oversight procedure requires the DoD to employ over 25,000 industry auditors and is estimated to have driven up costs by as much as 25 percent of the entire defense budget, or $75 billion a year.[8]

These examples strongly indicate that it is time to balance cost and performance by reducing the development of the technical requirements to what is realistic and acceptable to accomplish the function. It is important to realize two things when we are demanding perfection in the development and production of our weapon systems. First, we will not get it. And second, we will still pay for it. Development and use of realistic technical requirements during the development of a new system could significantly reduce the leadtime and costs of RD&A programs.

PROPOSALS OF THE SECRETARY OF DEFENSE

Other methods to reduce leadtime were recently revealed by the Secretary of Defense in the DoD plan to improve the acquisition process. Mr. Cheney's plan is well conceived but is dependent upon Congressional action to amend legislation that he feels contributes to long leadtimes. Key elements of this plan include changes that effect stability in the funding of programs, greater use of commercially available products, best buy practices, and better systems development.

MULTI-YEAR CONTRACTS

The first method to reduce leadtime that Mr. Cheney proposed involves amending legislation pertaining to multi-year contracts. His proposal would eliminate the current requirement that a proposed multi-year contract achieve a specific savings before the contract may be awarded. This change would expand the use of multi-year contracts and thus reduce leadtime by cutting contract award time and enhancing production. In addition, when development contracts are awarded on a multi-year complete package concept, the developer also becomes the producer for the first production buy, the minimum necessary to prove out the technical data package. By awarding multi-year contracts for all major programs, the DoD could eliminate timely and costly delays in awarding contracts and would assure that the product developed would be the same as that produced. This method of development and procurement could reduce leadtime without the loss of quality or reliability, and it also could reduce leadtime by reducing

excessive times in Research and Development acceptance testing and in advanced production engineering for Pre-planned Product Improvements (P^3I).

NON-DEVELOPMENT ITEMS

The second method to reduce leadtime proposed by Mr. Cheney's plan addresses greater use of commercially available equipment, or the increased acquisition of Non-Development Items (NDI). The acquisition process for a NDI is not a separate process, but a tailoring of events within the AR 70-1 (Systems Acquisition Policy and Procedures) process.[9] To streamline the acquisition cycle, AR 70-1 allows for the elimination of the demonstration and validation phase and/or the combining of the demonstration and validation phase with the full-scale development phase of the development cycle.[10]

NDI acquisition, sometimes called "Off the shelf" acquisition, is an acquisition strategy where the military procures an item from the commercial sector or an item already fielded in another service or foreign military. This NDI already meets or comes close to meeting a recognized need of the military. The thrust is to keep pace with technology advances, avoid long research and development cycles, and save time and money. NDI acquisition could be as simple as procuring a radio that the Motorola Corporation makes for the Drug Enforcement Agency, or the procurement of artillery pieces that the United Kingdom has already fielded. The NDI item that we obtaie may be ready for fielding as is, may require some modifications before

it can be fielded, or it may require some research and development before it is completely ready for fielding to U.S. forces.

NDI acquisition also coincides with using realistic technical requirements in the procurement of new technology. Rather than relying on excessively rigid military specifications, the DoD could make greater use of components and systems already existing through commercial-style competitive procedures for acquisition of NDI. This would shorten leadtimes, increase competition and enhance DoD's ability to acquire high-value commercial products that incorporate up-to-date technology. This proposal would exempt commercial products acquisition from the unique requirements that ordinarily apply and impose source preferences, special contract provisions and performance requirements when the government is the purchaser. The important point of NDI acquisition is that the military benefits by taking an already existing system that will require less research and development cost and that can be fielded in less time than the normal DoD Acquisition System could have provided a like item.

No matter how the DoD improves it acquisition structure or procedures, the system is unlikely to manufacture products as cheaply or as quick as the commercial marketplace. The DoD simply cannot duplicate the economies of scale possible in products serving as mass market, nor the power of the free market system to select and perpetuate the most innovative and efficient producers. There are many products in the commercial arena that could simply be painted OD green to satisfy the functional

requirement of the system. DoD Program Managers accordingly should make maximum use of these commercial products (NDI) in their programs, and the DoD should develop new or custom-made items only when it has been established that those readily available are clearly inadequate to meet military requirements.[11]

BEST BUY PRACTICE

Another method that Mr. Cheney has proposed involves a best buy practice. This basically means clarifying the competition in the Contracting Act to permit a contract to be awarded without discussions, on a basis other than price alone, when the award would be in the best interest of the government.[12]

This thought could be expanded to include a more judicious use of Research and Development dollars. The Defense Department spent nearly $38 billion on research and development in 1989, about one third of the R&D spending in the United States and one sixth of the world's R&D spending. But during the 1980s, defense R&D has been more "D" than "R": Just 10 percent of the $38 billion went for basic research - less, in real terms, than in 1965. The rest went for development of specific weapon systems.[13]

The House Armed Services Committee, concerned that Defense Department funding of development has come at the expense of research, pressed Congress to authorize in the 1990 defense budget $500 million for basic research on critical technologies to bolster our potential to field superior military systems.

Still, basic research fell by about 8 percent in real terms in the 1990 defense budget and held steady in the 1991 budget.[14]

Using the "best buy practice" to hedge against the shrinking defense budget based on the perceived reduction of the Soviet threat, we could award contracts to pursue a real research and development system, rather than a develop and buy system. Basically, to hedge against the uncertainty of the new threat we could continue to develop new weapon systems but not produce them until we see whether the Soviet threat develops in a way that tells us we need them. This "best buy approach" would have to be a disciplined system, one that can pick and choose between technologies, prototype them, demonstrate them, validate them, then put them on the shelf against the day they might be needed. One result of this approach would be that it would enable us to fly before we buy. The problem with this concept in the past was that it took too long. The Soviet threat meant that we had to get the new weapons quickly and therefore we had to rely on models and paper studies rather than prototypes. With a best buy concept that allows competitors time to adequately develop technology, there would be time, because we would be delaying a buying decision anyway, waiting to see if the threat developed.[15] This practice could give us the best equipment because it would allow contracts in the best interest of the government to be awarded without discussions as to who was the developer of the best product. Contracts awarded in this manner would significantly reduce leadtime.

BETTER SYSTEMS DEVELOPMENT

Mr. Cheney's last proposal to reduce leadtime is to eliminate some of the extensive testing that is conducted in the various phases of equipment development. Mr. Cheney refers to this as better systems development. The developer conducts extensive tests prior to release to the Project Manager. The Program Manager conducts extensive engineer and service testing prior to operational tests conducted at the user level. Acceptance testing performed by the developer duplicates most of the tests performed in the engineer tests conducted by the Program Manager, and is further duplicated by the Operational Test of the user. Leadtime could easily be reduced by reducing some of the testing time and holding industry accountable for producing sound and reliable equipment at the contracted specifications. The Secretary of Defense states we can do this by providing for early test and evaluation of prototype hardware to prove concept, performance and suitability in realistic operational environments well prior to the commencement of a high rate of production.[16]

ENDNOTES

1. "A Quest for Excellence", Final Report to the President by the President's Blue Ribbon Commission on Defense Management, January 1986, p. 47.

2. Ibid., p. 42.

3. "A Healthy Military-Industrial Complex." U.S. News & World Report, 12 February 1990, p. 42.

4. Ibid., p. 43.

5. Ibid.

6. Ibid.

7. Ibid.

8. Ibid.

9. U.S. Department of the Army. Army Regulation 70-1: Systems Acquisition Policy and Procedures. 12 November 1986, p. 28.

10. Robert R. Lehnes, "NDI: The MSE Acquisition Strategy." RD&A Magazine, January-February 1987, p. 2.

11. "A Quest for Excellence", Final Report to the President by the President's Blue Ribbon Commission on Defense Management, January 1986, p. 61.

12. Defense 89 Special Issue, Secretary Cheney's Management Report, pp. 8-9.

13. "A Healthy Military-Industrial Complex", p. 48.

14. Ibid.

15. Les Aspin, "Budget for Defense in a Whirlwind." House Committee on Armed Services before the National Strategy Forum, 19 January 1990, p. 5.

16. Defense 89 Special Issue, p. 14.

CHAPTER V

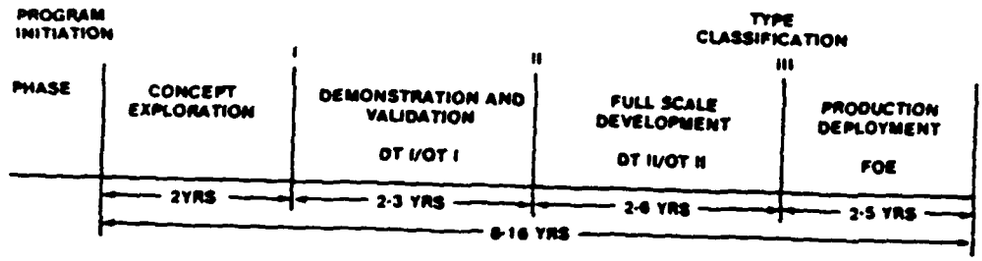
MSE - MEETING THE CHALLENGE

One outstanding example of an acquisition program that is being executed using the methods discussed in Chapter IV to reduce leadtime is the Army's acquisition and fielding of the Mobile Subscriber Equipment (MSE) system. In addition to being formed with a select group of professionals, the program was established with stable funding in support of a multi-year contract; it was the largest NDI acquisition (4.5 billion dollars) of communications equipment the U.S. Army has ever made; it incorporated a "best buy practice"; and it was executed using streamlined testing procedures.[1] It is estimated that the NDI MSE acquisition and fielding will save the Army more than 1.5 billion dollars in acquisition costs and over 8 billion dollars in life cycle costs.[2] Additionally, the complete implementation of MSE is predicted to save approximately 5000 active duty soldier spaces from the Army's force structure, a good example of the how the DoD can benefit from the acquisition of advanced technology.

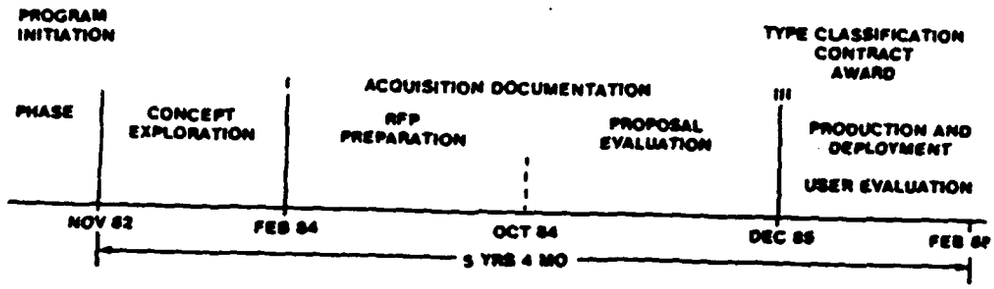
COMPARISON TO STANDARD ACQUISITION LIFE CYCLE

The following charts show a comparison of the standard DoD acquisition life cycle and how the streamlined MSE acquisition cycle has significantly reduced leadtime:

STANDARD LIFE CYCLE



MSE LIFE CYCLE



It is obvious that the MSE program has significantly reduced leadtime in the acquisition of this new system. The question that must be answered is "why and how did the Army obtain MSE so quickly?".

CAPITALIZING ON EXISTING TECHNOLOGY

Technology in the arena of tactical communications is advancing very quickly, especially in the electronics, computer, and computer software areas. Although many fields of technology may require DoD's continued expenditure of research and development funds, much of what the Army needs is being developed or has been developed within the civilian market or in foreign military markets. To obtain this needed technology before it

becomes obsolete, the Army must be able to acquire it directly from the commercial sector or foreign military source and quickly field it to our soldiers. If this cannot be done, then the Army will continue to develop and field equipment, such as SINCGARS, that contains twenty year old technology before it gets into the hands of the user.

With this as a premise, the senior Signal Corps leadership took streamlined initiatives to acquire the Mobile Subscriber Equipment. From the very beginning of the MSE initiative it was considered essential to establish a clear command responsibility with enough weight to get this important program started.

DEDICATED AND WEIGHTED LEADERSHIP

An Executive Committee, chaired by MG T. D. Rodgers (Commander of the U.S. Army Signal School and Fort Gordon), was established as a part of the Source Selection Evaluation Board (SSEB). Others members of the Executive Committee included BG J. W. Wakelin (Commander of the U. S. Army Research and Development Center, CECOM), and Colonel J. Hammett (Chief of Staff of the Army Signal Center). This Executive Committee was established to report directly to a Senior Advisory Council (SAC) consisting of nine general officers and 5 Senior Executive Service Members from the key Army elements involved in the MSE acquisition. The SAC was chaired by the CG, Army Material Command (AMC). Keeping with the weighted leadership concept, the Secretary of the Army was named Source Selection Authority. And to ensure the professional management and timely execution of the MSE program, top ranking

military and civilian acquisition personnel were hand-picked from the RD&A and Signal community to staff the executive committee, the Source Selection Evaluation Board, and the MSE Project Management Office.

ACCELERATED ACQUISITION PROCESS

The initial MSE Request for Proposal (RFP) was prepared in 1983 for a divisional communications system to augment the TRI-TAC Communications System (a joint service area communications system) that was in RD&A for implementation at Corps and above. Based on the 1983 Battlefield Communications Review (BCR), the Army redirected the MSE program to replace TRI-TAC at Corps. The Under Secretary of the Army approved the MSE program and directed that the Army procure a tactical communications system for Corps and below on a nondevelopmental basis.

Because of the complex nature of the MSE requirement and the uniqueness of the NDI acquisition approach, the traditional ROC document was not considered appropriate and a MSE Operational Capabilities Document (MSEOCD) was developed jointly by the combat developments community and the material developments community instead.[3] The MSEOCD defined in realistic technical requirements the general performance characteristics that the Army would accept in the new tactical communications system. With this the Army was able to conduct a market survey to insure that systems already existed that would meet the minimum realistically stated requirements of the desired MSE system.

The MSE source selection started with the release of the RFP on 2 July 1984. The RFP required contractors to propose a total MSE system that had been designed, developed, tested, and whose principal components were already in existence. The RFP also required a field demonstration of the system characteristics using production equipment in its final offered configuration. The RFP further required the contractor to include mandatory priced options for capabilities that might be delivered with the system at the original fielding, or that could be retrofitted at some future time. These included the use of the Army standard support equipment (vehicles, generators, and other like items), and the ability to integrate with other Army standard and North Atlantic Treaty Organization (NATO) communications systems.[4] Interested contractors were provided detailed briefings on the requirements prior to and after the RFP release. The contractors were instructed that they could bid any proposal that met the RFP requirements. They were further informed that the guidance from the Army's General Council's Office was that they were to propose a "best operational system".

Proposals from Rockwell/Collins and GTE were received on 1 October 1984. An Evaluation Board consisting of dedicated professionals was handpicked to evaluate these proposals. Many of these key individuals have since become key members of the Project Managers Office, CECOM, Department of the Army Staff, and the U.S. Army Signal Center. In completing its initial evaluation of the proposals the Board identified deficiencies, weaknesses, and high risk areas. Demonstrations were then

conducted of each contractor's "best operational" configuration during the December 1984 to March 1985 time period. Numerous agencies such as the Army Operational Test and Evaluation Agency (OTEA), the General Accounting Office (GAO), the Army Audit Agency (AAA), and the Army Materiel Systems Acquisition Agency (AMSAA) were requested to monitor the evaluation effort. The participation of these agencies and their ability to provide timely and accurate information to the Office of the Secretary of Defense contributed directly to the efforts of the Evaluation Team.

After negotiations with each contractor, a revised Army "best operational system" was developed and contractor proposals were requested again. The Evaluation Board then prepared a final (frozen) validation of the Statement of Work and specifications, and model contracts which were forwarded to each contractor with a request for their "Best and Final Offer". The preparation of model contracts prior to the request for a "Best and Final Offer" was a new procedure initiated during the MSE contract negotiations.[5] The "Best and Final Offer" proposals were evaluated 12 - 18 August 1985, and immediately presented for decision to the Senior Advisory Council and the Secretary of the Army. In December 1985 the initial MSE contract was awarded to GTE.

In tempo with the accelerated concept the Vice Chief of Staff of the Army approved and implemented a HQDA MSE Action Plan (DAMAP) on 12 March 1986.[6] This plan was implemented to organize the HQDA Staff to effectively monitor and to take the

necessary actions on major MSE issues. This was necessary because of the MSE's NDI nature, the sheer size of the program, and because of the accelerated fielding where many issues had to be staffed, brought before the senior Army leadership for decisions, and implemented in other than the normal way of doing business.

The DAMAP process called for semi-annual briefings to the VCSA. Each briefing was preceded by a series of meetings at the Council of Colonel and General Officer Steering Council levels to weed out, resolve and firm up issues at the action officer level prior to presentation to the VCSA. As of 9 March 1989 six DAMAP In Process Reviews have been presented to the VCSA, and they have proven to be an excellent method to raise issues to the appropriate decision making level for quick resolution.

The 1st Cavalry Division, Fort Hood, was selected to be the first unit to receive MSE, and fielding was scheduled for the 5 February to 10 May 1988 time period. This decision was made in early 1986 alowing the Division and the III Corps Commander and staffs plenty of time to plan their involvement in the fielding of MSE. This involvement increased with the start of doctrine and tactics training during the month of December 1987. During the new systems training period, a thorough evaluation of the training courses and documents was conducted by the Signal Center in conjunction with the CECOM New Systems Training Division. Each course taught was scrutinized and changes made as necessary to improve training and the users understanding of the MSE equipment and system.

The fielding and training schedule was extremely ambitious in order to complete the first fielding by May 1988, and the senior leadership expected some problems. To resolve quickly these problems or any issues, a Project Management Initiated Incident Resolution System was established and rehearsed. This incident resolution system involved key personnel in the 1st Cavalry Division, the PM-MSE, the III Corps MSE Task Force, GTE, the U.S. Army Signal Center, OTEA, and CECOM. It worked in such a manner that key personnel could raise issues or problems quickly to the appropriate decision makers at the HQDA and DoD level for resolution.

An important priority during this period was to insure that the MSE system did not proceed to the Follow-on Operational Test and Evaluation (FOT&E) until the Division felt it was adequately trained and organized. Another priority was to ensure that the MSE system was operationally capable of meeting the division's tactical communications needs. As problems were encountered corrections were made and the events repeated to ensure success. The Division conducted three Command Post Training Exercises before the Division Commander, the Deputy Commandant of the Signal Center, and the Project Manager felt that the MSE system was ready. The MSE system was pronounced ready to proceed to the FOT&E at the Operational Test Readiness Review (OTRR) on 9 August 1988.[7]

The FOT&E of the MSE system was conducted from 9 August through October 1988. OTEA conducted the FOT&E as a part of its "Continuous and Comprehensive Evaluation" of the MSE Program that

had started with the Request for Proposals in 1984. The Test and Evaluation Plan approved by HQDA in June 1987 had been written and tailored to the fact the MSE was to be an NDI acquisition. Keeping in tempo with the accelerated concept, there was also a time constraint imbedded within the plan to complete the FOT&E in time to support the Option Year 3 decision of the multi-year contract.

A three phase FOT&E (Pilot Test, Division Command Post Exercise, and Record Test) was conducted in a realistic tactical environment at Fort Hood, Texas. OTEA used approximately 700 personnel to conduct a demanding evaluation of the MSE system and the unit going through the test. Once started, the FOT&E was conducted very efficiently. This was attributed to the efforts that had taken place during the May to July 1988 time period as problems were identified and fixes were made and verified as corrected. The favorable results of the FOT&E report, which were published in April 1989[8], led to an Army decision to purchase Option Year 3 of the MSE contract and continue fielding.[9] Also of note was the fact that the GAO established a team within the OTEA test headquarters at Fort Hood for the duration of the FOT&E. This allowed the GAO to witness the conduct of the FOT&E and allowed them to make a timely report to the House of Representatives Subcommittee on Procurement and Military Nuclear Systems, Committee on Armed Services in July 1989.[10]

SUMMARY

Although the acquisition leadtime of the MSE system was significantly reduced in comparison to the standard DoD acquisition life cycle, the intent of all decision milestones was met. The Milestone I decision for MSE was a memo from the Office of the Secretary of Defense to the Under Secretary of the Army which stated that a DSARC wasn't needed and left the decision with the Army. The Under Secretary of the Army directed an NDI procurement, and with an NDI decision there was no need for a Milestone II decision. For the Milestone III production decision and type classification, the MSE Project Manager put together the MSE type classification package from the results of the source selection board for a briefing to the Senior Advisory council and the Secretary of the Army who had been designated senior selection authority. The approval of this presentation by the Secretary of the Army was the basis for the Milestone III decision to award the production contract and type classify the system.[11]

The MSE program is proving to be a very successfully accelerated acquisition program and it's streamlined procedures should be applied to future Army system requirements. General Wagner, former Commander of AMC, referred to MSE as the Army's best example of a good effort to procure the best available system, thus saving considerable research and development time and cost.[12] Highlighting the success of the program are the facts that it had stable funding and congressional support[13]; it had the senior leadership of the Army involved necessary to

overcome the bureaucratic bottlenecks that Secretary Cheney's initiatives address[14]; it had hand-selected professionals that have remained with or involved with the interest of the program; it supported a best buy practice; and the program streamlined evaluation and testing procedures and did not proceed to the FOT&E until the system, the initial user, and the testing community were all adequately prepared to ensure success.

ENDNOTES

1. Robert R. Lehnes, "NDI: The MSE Acquisition Strategy." RD&A Magazine, January-February 1987, pp. 1-5.

2. Daniel J. Marcus, "Army MSE to GTE". Signal, November 1985, p. 7.

3. William Kelly and LTC Louis Martin, "MSE: An Overview." Signal Magazine, Fall 1984, p. 6.

4. HQ CECOM (AMSEL-PL-OP) Memorandum, Subject: Lessons Learned from MSE Program, dated 22 December 1987, pp. 7 - 9.

5. Ibid., p. 13.

6. DAMA-CSC, Action Memorandum: HQ Department of the Army Mobile Subscriber Equipment (MSE) Action Plan, 4 March 1985, Approved by VCSA on 12 March 1985.

7. Report: IER-FO-1148, by the U.S. Army Operational Test and Evaluation Agency. "Independent Evaluation of the Mobile Subscriber Equipment (MSE)." 27 April 1989.

8. Independent Evaluation of the MSE by the Operational Test and Evaluation Agency (OTEA), 22 April 1989.

9. Ibid.

10. GAO Report to the Honorable Les Aspin, Chairman, Subcommittee on Procurement and Military Nuclear Systems, Committee on Armed Services, "Follow-on Operational Test and Evaluation for Mobile Subscriber Equipment." 6 July 1989.

11. Lehnes, p. 3.

12. General Louis C. Wagner, Jr. "Modernizing the Army's C^3I." Signal, January 1989, p. 8.

13. Ibid.

14. Defense 89 Special Issue, Secretary Cheney's Management Report, pp. 8-9.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

Research, Development, and Acquisition (RD&A) programs are vitally important to our national defense and military strategy. They provide the key to the modernization of our forces, and they help ensure that the United States maintains a qualitative advantage over potential adversaries. How well the Army can maintain its advantage will depend, to a large extent, on how effective its research and development organizations react to state-of-the-art advances and how soon these advances can be applied to new systems. Preparing and executing an effective acquisition program that supports our national security strategy while providing investments for the future remains complicated by the need for fiscal restraint. While facing the possibility of a vastly shrinking defense budget over the next decade, the United States must still plan for and continue to provide an effective deterrent, pursue technological advances that improve defense capabilities, and maintain the quality and readiness of its forces. This means that in order to keep our Army modernized with systems containing the latest technology we must significantly reduce the current ten to fifteen year acquisition cycle that is fielding equipment with obsolete technology. Several initiatives have been discussed in this individual study project that have been proposed as methods to reduce leadtime. They include implementing a new management philosophy (Total Quality Management) that reinforces the belief that people if

given the opportunity will enthusiastically contribute their knowledge and skill to do what is right in a timely manner. These methods also called for changes that include closer scrutiny of the technical requirements development to eliminate goldplating, and a proposal to amend legislation to eliminate the current requirement that proposed multi-year contracts achieve a specific savings before the contract may be awarded. Other methods proposed to reduce leadtime included the increased acquisition of off-the-shelf (NDI) equipment that capitalizes on existing technology, the expanded use of multi-year contracts to reduce contract award time, and a Better Systems Development concept that proposes reducing testing time and holding industry accountable to produce sound and reliable equipment. Another method discussed included the expanded use of a Best Buy Practice that stresses more judicious use of R&D dollars to allow competitors adequate time to develop technology, and that allows contracts in the best interest of the government to be awarded without long debates about who was the developer of the best product.

In addition to these needed changes, I believe the following recommendations are also consistent with the efficiency, economy, and effectiveness needed to reduce leadtime during this period of fiscal constraint:

(1). We need to establish better cooperation among the numerous interest groups involved with each of our RD&A programs. Military Program Managers and civilian R&D contractors need to

start working more hand in hand in presenting programs for approval. A unified position on requirements, desired technology, and production will get programs through Congress much faster than if special interest groups oppose the technology we want.

(2). The current administrative requirements governing RD&A programs should be restructured/revised to reduce this self-imposed burden. We need a new set of streamlined DoD-level directives and instructions. We need to cancel, combine, or revise the text and clauses of the Defense Federal Acquisition Regulation Supplement (DFARS), and the Department and Agency contract clauses.

(3). We cannot continue to delay modernization of our forces waiting to add the most recent technological advances to our programs. We need to stop changing requirements and specifications in midstream as new technology is developed. Delaying or stopping production in an attempt to incorporate the most up to date technology leads to long leadtimes that ultimately result in the fielding of obsolete technology anyway. The SINCGARS program is a good example of how this can happen. We need to assume some near term risk in the RD&A process to reduce leadtime. This means producing equipment now with existing technology. If a better technology is developed during the acquisition life cycle of the currently planned system, we need to hold that technology (leap ahead) until the next

generation of the system, and we need to produce only enough of the current program's equipment to field units of Force Package 1 - units that need to deploy, the forward deployed units, and the contingency units.

These initiatives could substantially reduce the leadtime of the system acquisition cycle thus enabling productivity and quality to become hallmarks of the defense acquisition process.

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