THE IMPACT OF DECISION-MAKING THEORY ON THE DEPARTMENT OF DEFENSE'S ACQUISITION PROCESS FOR THE PROCUREMENT OF MAJOR WEAPON SYSTEMS

by

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LIST OF ABBREVIATIONS

ACAT	Acquisition Category
AFSC	Air Force Systems Command
ASARC	Army Systems Acquisition Review Council
ASCO	Advanced Systems Concept Office
ATB	Advanced Technology Bomber
AWC	Air War College
B-1A	United States Air Force bomber aircraft
B-2	United States Air Force Stealth bomber aircraft
BPR	Business Process Reengineering
CAE	Component Acquisition Executive
CBO	Congressional Budget Office
CCAA	Centralized Civilian Acquisition Agency
CNO	Chief of Naval Operations
CINCS	Commander in Chiefs
CJCS	Chairman Joint Chief of Staff
CORM	Commission on Roles and Missions
CRS	Congressional Research Service
DAB	Defense Acquisition Board
DAE	Defense Acquisition Executive
DAWIA	Defense Acquisition Workforce Improvement Act

DCP	Defense Concept Paper
DCMC	Defense Contract Management Command
DLA	Defense Logistics Agency
DMR	Defense Management Review
DoD	Department of Defense
DoDD	Department of Defense Directive
DPG	Defense Planning Guidance
DPRC	Defense Program Review Committee
DSARC	Defense Systems Acquisition Review Council
DSB	Defense Science Board
DSMC	Defense System Management College
EXPO	Extended Range Poseidon
FY	Fiscal Year
GAO	General Accounting Office
GSRS	General Support Rocket System
HBR	Harvard Business Report
HCS	Harvard Case Study
HASC	House Armed Services Committee
ICM	Improved Conventional Munitions
IDA	Institute of Defense Analysis
IOC	Initial Operating Capability
JCS	Joint Chiefs of Staff
JROC	Joint Requirements Oversight Council

MAIS	Major Automated Information System
MAISRC	Major Automated Information System Review Council
MARS	Multiple Artillery Rocket System
MDAPS	Major Defense Acquisition Programs
MIRV	Multiple Independent Reentry Vehicle
MLRS	Multiple Launch Rocket System
MOOTW	Military Operations Other Than War
NATO	North Atlantic Treaty Organization
NSC	National Security Council
NSDD	National Security Decision Document
NSS	National Security Strategy
NWC	Naval War College
OMB	Office of Management and Budget
OSD	Office of the Secretary of Defense
OT	Operational Test
OTEA	Operational Test and Evaluation Agency
PEO	Program Executive Officer
PERT	Program Evaluation and Review Technique
PNVS	Pilot's Night Vision System
PM	Program Manager
PPBS	Planning Programming and Budgeting System
RFP	Request For Proposal
SAE	Service Acquisition Executive

SALT	Strategic Arms Limitations Talks
SAR	Special Access Required
SECDEF	Secretary of Defense
SLBM	Submarine Launched Ballistic Missile
SPLL	Self Propelled Launcher Load
SPO	System Program Office
STRAT-X	Strategy Executive Panel
TADS	Target Acquisition Designation System
TRADOC	Army Training and Doctrine Command
USD/A	Under Secretary Of Defense (Acquisition)
USDA (A&T)	Under Secretary of Defense (Acquisition and Technology)
ULMS	Underwater Launched Missile System
VCJCS	Vice Chairman Joint Chief of Staff

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TABLE OF CONTENTS

PAGE

LIST OF ABBREVIATIONS iii

ACKNOWLEDGMENTS vii

LIST OF FIGURES xii

CHAPTER

1 INTRODUCTION 1

Statement of the Problem 1
Objectives of This Dissertation 4
Relevance of the Research 7
Background to Decision Making 8
Background of Defense Department Acquisition Decision Making 12
The Impact of This New Leadership at Defense 15
Goldwater-Nichols Act of 1986 19
A Brief Outline of the Structure of the United States Military 20
Organization of the Study 23

2 LITERATURE REVIEW 24

The Principles of Public Administration 24
The Formation of American Public Administration Decision Making 24
The Development of Public Sector Decision Making 26
Early Public Administration and Woodrow Wilson 28
The Scientific Management Basis for Decision Making 29
The Growth of Public Administration Decision Making 32
The Impetus to Growth of the Decision-Making Process 33
The Impact of the United States' Role in a Post-WWII Environment 35
Decision-Making Theories 37
Individual Motivation for Decision Makers 49

CHAPTER PAGE

3 THE DoD ACQUISITION COMMUNITY DECISION-MAKING PROCESS....60

Background....60
The Acquisition Decision-Making Process....61
The Four-Step Defense Acquisition Decision Methodology....63
The Role of the Office of Secretary of Defense in Acquisition Decision Making....67
Cold War Strain on the Acquisition Decision-Making Process....69
The History of the Planning, Programming, and Budgeting System....73
Program Acquisition Categories....77
What Are the Issues With DoD Acquisition Reform?....79
Why Is the Defense Acquisition Decision-Making Process Structured As It Is?....81
The Role of the SECDEF and Military Departments in Defense Acquisition Decision-Making Process....82
The Role of Service Department Secretaries in Decision Making....87
Changes in the Defense Acquisition Decision-Making Process....88
The Impact of Changes to the Defense Acquisition Decision-Making Process....92
Industrial Preparedness and the Decision-Making Process....95

4 INFLUENCES UPON DEFENSE ACQUISITION DECISION MAKING....99

Independent Factors....100
Factor One: The Military Budget....103
Factor Two: The Issue of the Changing Military Missions....116
Factor Three: The Actors Within the Defense Acquisition Decision Process....120
Factor Four: The Acquisition Program as Reflected by Acquisition Process Metrics: Cost, Schedule, and Performance....128
Factor Five: Congressional Guidance Upon Defense Acquisition Decision Making....132
Factor Six: The Increased Use of High Technology in Today's Defense Weapons Smart Weapons....138

5 THREE CASE STUDIES....143

Case Study 1: B-2 Stealth Bomber....144
Introduction....144
Why Was the B-2 Needed?....144
B-1 Evolution, or the Bomber That Never Was....145
Why a B-2 "Stealth" Bomber Was Needed....149
Cost Concerns Exposed....150

CHAPTER PAGE

Congressional Concern....153
Case Study 2: Trident Submarine....157
Introduction....157
Early Program Decisions....158
The Navy and Strategic Ballistic Missile Submarines....161
ULMS and SP: Admiral Smith....163
Enter Zumwalt....166
Another Design Development Decision....167
OSD Decision by David Packard....169
Packard's Decision....170
Decision Reversal....171
The Final Configuration....173
Case Study 3: The Multiple Launch Rocket System....174
MLRS Concept: The Beginning....176
Bigger but Not Necessarily Better Missiles....177
Convincing Field Artillery....179
MRL's First Program Manager....180
Seggel's Management Style....182
Cost Control in the Program....183
Building Missile Decisions....184
International Production Considerations....185
Outside Support....186
Role of the Contractor in This Program....187
Prototype Testing....188
Production Decision Is Reached....190
High Rate of Missile Production Decision....190
Summary....193

6 SUMMARY AND RECOMMENDATIONS....194

Summary....194
Lesson From the Literature Review....196
Current Defense Acquisition Issues That Will Impact the Decision-Making Process....203
Bringing Potential Commercial Practices to the DoD Decision-Making Process....208
How DoD Makes Acquisition Decisions....210
The People in the Defense Acquisition Decision-Making Process....211
Structure of Defense Acquisition Decision Making....212
The Impact of War Efforts Also Affect the Acquisition Process....217
Recommendations....218
A New Model for Defense Acquisition Decision Making....218
How to Implement This Proposed Decision-Making Model....221
A Proposed Methodology to Incorporate These Five Possible Options....229

CHAPTER PAGE

Future Studies....234
How Defense Acquisition Decisions Are Made Elsewhere....234

REFERENCES....238

LIST OF FIGURES

FIGURE		PAGE
1	Illustration of the National Command Authority for Military Operations	20
2	Pathway for defense acquisition decisions	21
3	Diagram of the defense acquisition decision model	64
4	Venn diagram of defense acquisition decision-making process	93
5	Three major steps in the decision-making process	218
6	Diagram of a civilian DoD acquisition workforce	233

CHAPTER 1

INTRODUCTION

Statement of the Problem

> The needs of national defense are not always paramount behind each decision. Other agendas quite often come into play, like careerism and the opportunity for well-paying jobs after retiring from the military (Burton, 1993, p. 149)

The defense acquisition system is a quasi-scientific decision-making process that swims in a sea of political change. The purpose of this decision-making process is to translate military operational needs into affordable major weapon system programs that are designed, developed, produced, and supported by the United States Department of Defense (DoD) to accomplish its national defense mission.

There are two basic, often competing, goals facing the DoD acquisition decision-making process: (a) to obtain essential military equipment capabilities at minimum cost, and (b) to maintain the industrial flexibility and innovative potential to enable the United States to respond rapidly to changing threats to national security. The first of these goals may be best satisfied through defense acquisition decision policies favoring standardization of the weapons procured, thus minimizing the assortment of items procured and encouraging competition from weapon producers in which it may be expected to reduce the life-cycle cost of the weapon. On the other hand, the second of these above-mentioned goals may best be satisfied through policies discouraging

standardization and increasing the assortment of items procured and encouraging competition even when it increases the total life-cycle cost of the item (Cheney, 1977).

The United States federal government is faced with many decisions concerning the appropriate expenditure of public funds to address the myriad of needed causes. The DoD's acquisition decision-making system is by far the largest single on-going government enterprise, managing over $60 billion per year on the research, development and procurement of major weapon systems for the military (Cohen, 1997b). Within the entire scope of total federal expenditures, the DoD reigns as the federal agency that controls the majority of discretionary federal funding and will continue to do so for the foreseeable future.

There is, however, a cyclical nature to this large federal funding allotment. The defense department endures a predictable yet unreliable annual appropriation of federal funds. During periods of peace usually the funding to the DoD is dramatically curtailed, and during periods of war the funding is immediately and usually substantially increased. While this phenomenon is understandable from the standpoint that wars need to be immediately and fully financed if they are to be won, the question remains whether this funding scheme has an adverse impact on the defense acquisition decision-making process.

This study examines the influences on the DoD while making decisions during the acquisition process in the procurement of its major weapon systems. Also examined is how acquisition decisions are made in the DoD and does the decision-making process incorporate the wisdom of organizational theory illustrated in the writings of academic experts of the decision-making process?

Additionally, there have been many other factors that impacted acquisition decisions in the DoD. Some of these influences are external to the defense department, while some are internal to the defense acquisition decision-making process. The external influences are labeled as open environment changes. For purposes of this dissertation the term "open environment" is defined as "if the organization in question was a living organism existing in a wider environment on which they depend for the satisfaction of various needs" (Morgan, 1986, p. 39). A partial list of examples of these influences could include the Gulf War, the fall of the Soviet Union, the emergence of China as a world power, and the strength of the American economy. Open environment places opportunities or restrictions upon the DoD structure or processes from outside the institution and beyond its control. Some examples of these open environment effects include a decrease in the federal budget to the DoD, a change to the military threat faced by the United States, and the changing Congressional interests as witnessed by the passing of the 1986 Goldwater-Nichols Defense Reorganization Act.

There are also changes to the internal environment in which the DoD operates. For purposes of this dissertation, I define the "internal environment" as that set of processes embedded within the DoD organization over which the organization has complete control and, specifically, the internal environment changes to be discussed here are those actions taken by the DoD that affect its acquisition decision-making process. Some examples of internal DoD environment influences include the changes to DoD rules, regulations, and policies that govern the defense acquisition of major weapon systems, the people selected to manage acquisition programs, and the choice by the DoD to use high technology in design and development of weapon systems.

Objectives of This Dissertation

This dissertation is grounded in the decision-making theory as expressed in the academic disciplines of Public Administration, Political Science, and Sociology. It examines numerous published materials on the topic of "decision making" by Abraham Maslow, John Gaus, Richard J. Stillman, Charles Lindblom, Frederick Taylor, Herbert Simon, Woodrow Wilson, and Max Weber. The intent of this literature review is to compare the premises of these writers and relate these theories to the observed model of decision making used in the DoD's acquisition community.

This dissertation focuses on the decision-making process imbedded within a large federal agency. The focus of the dissertation is on classical decision-making theory with the purpose of rending a determination as to whether it is possible to incorporate the tenets of decision-making theory evidenced in the writings on organization theory into the DoD acquisition decision-making process. The empirical observation uses the DoD because it is a very large federal bureaucracy and because it offers a situation that illustrates a formal decision-making process. Due to the large size of this federal agency, measured in the number of people employed; the large annual funding congressionally appropriated; and the complexity of this institution's mission this study only focuses upon the decision-making process within the DoD's acquisition community.

The major weapon systems currently in the DoD acquisition decision-making process reflect significant changes that have evolved as a result of changes in the arena of international affairs. Therefore, while this is not a study of international affairs, it will include insights into the current changes occurring in international diplomacy to

adequately examine why the defense acquisition process is behaving in the manner being reported.

The obvious collapse of Soviet Union's military power has radically altered this nation's political, economic, and defense policies vis-à-vis an archenemy of some 50 years. The breakup of the Soviet Union also has led to changes in the DoD's acquisition community's decision-making process and policies.

> The threat (Soviet Union) that drove our defense decision making . . . is gone. Indeed, the determining aspect of the current defense procurement (acquisition) environment and decision-making process is the new reduced budget. (Gutmanis, 1997, p. 28)

During the 1980s, annual defense spending, measured in constant years dollars, averaged $306 billion; 1989 was the peak year for DoD with appropriations at $327 billion. For fiscal year 1997, the DoD budget was estimated to be at $250 billion, and other reductions were debated in Congress and in the media (Cohen, 1997b). The FY 2003 defense budget appropriated by Congress is $355 billion ("Defense bill finally passed by Congress," 2002).

Present and anticipated changes in defense spending have precipitated changes in the planned acquisition of many new weapon systems, including canceling some development programs for new systems and/or reducing the total number of systems to be procured for other programs. In fact, some reductions in military weapon acquisition began in the mid- to late-1980s. Since 1985, the DoD has terminated hundreds of programs (Kapstein, 1993), including the Navy A-X attack aircraft, the procurement of additional EA-6B electronic warfare aircraft, certain modifications to the Air Force F-16 fighter, and the follow-up early warning radar system. Also, the planned total

procurement inventory for some major weapon system programs was reduced. Examples of major weapon system programs that have been reduced include the Air Force's B-2 bomber and the F-22 air superiority fighter, the Army Comanche helicopter, and the Navy F/A-18E/F strike aircraft.

The effect of changing the DoD budget each year has had additional impacts on the decision-making process. An example of this was the formulation of a formal review process to analyze the future acquisition requirements of the Defense Department. This formal review process, the Quadrennial Defense Review (QDR), is intended to review all acquisition programs every 4 years (Gutmanis, 1997). Through this initial review in 1997, the QDR process recognized that the country faces the diplomatic challenge of dealing with other countries facing political and military instability. Resurgent nationalism, the challenge of new and failing states, religious conflicts, and international terrorism makes today's national and international security environment dangerous and unpredictable (Shalikashvili, 1998).

Throughout this QDR process, the nation's senior decision-makers first determined that the nation could not sacrifice today's military's readiness to generate the necessary funds for military acquisition for modernization to defeat tomorrow's threats. The DoD challenge was to find a way to achieve both objectives. In order to generate the necessary funds for current readiness and future modernization projects, the DoD recommended significant reductions in both the military and civilian personnel strength (i.e., to reduce the number of people employed by the DoD). Most of these cuts in the number of personnel employed were intended to come from the operations support and infrastructure parts of the defense force. However, with the present increase in operational

deployments that has marked the post Cold-war period, the DoD could not make deep cuts in operating forces and continue to support the current military strategy (Shalikashvili, 1998). The impact on this strategy decision is that the defense acquisition community will now be targeted for these reductions in personnel, and this action could have a significant impact on the defense acquisition decision-making process.

This notion of significantly reducing the number of individuals directly involved in the acquisition decision-making process is not new. Jacques Gansler, the former Undersecretary of Defense for Acquisition and Technology, the senior defense acquisition decision-maker, previously stated in 1995 the need for the same type of reduction in personnel. In his book, *Defense Conversion: Transforming the Arsenal of Democracy,* he specifically articulated the need to reduce the number of personnel involved in the defense acquisition process. His plan included reducing the number of government acquisition people as well as other government workers in depots, labs, arsenal, and federally funded research and development centers. He estimated the total reduction of the acquisition work force by 40% (Gansler, 1995).

Relevance of the Research

> Last month's revelation that pilots are flying dangerous missions over Kosovo without the benefit of some information technology (equipment) that could save lives should serve as a strong reminder that defense acquisition reform is a work in progress. (Federal Computer Week – April 5, 1999, p. 18)

The purpose of this dissertation is not to address the overall United States defense institution, nor is it a study specifically on the United States defense acquisition process. This dissertation is focused on one fundamental element within the study of public

administration--the decision-making process. The material covered in this dissertation focuses on the decision-making process that is embedded in a large federal public bureaucratic institution. I chose to use the lens of decision making in the current DoD acquisition community because it afforded several case studies as means to depict the formal process of decision making. This dissertation is not focused strictly on the national security related issue, but instead, it is focused on the much larger issue of how decisions are made in a large public institution.

Background to Decision Making

> The formal analysis and diagnosis of organizations, like the process of reading, always rest in applying some kind of theory to the situation being considered. For theories, like reading, are interpretations of reality. (Morgan, 1986, p. 12)

The study of how decisions are made and implemented in public institutions is an important topic in the field of Public Administration. In the development of bureaucracy as an "ideal" type of organizational structure, Max Weber (1978) defined the organization as a system of authority relationships defined by rationally developed rules. Weber characterized bureaucracy as a rational and effective organizational structure with clearly developed characteristics. He later addressed one of the main points of decision making in his discussion on *rationality*. Weber advanced the theory that an individual weighs the *means, ends, and consequences* of his actions as he makes decisions.

While Frederick Taylor (1934) did not write directly about rational decision making, he did write on the development of scientific management, which is a concept based on the efficient approach to organizational operations and procedures. A basic theme of his, which he evolved early in the 19th century, was the idea of using a "time

and motion" study to examine the work process. The decision-making process was thus broken down, during the industrial age, into a series of small steps and then each step evaluated as to its contribution to the attainment of the ultimate objective.

The seminal work, *Inside Bureaucracy* by Anthony Downs (1994), pointed to many of the administrative issues of organization theory that are faced in large bureaucracies. One of those issues is the decision-making process within these public institutions. Downs wrote that because of the need for adequate data, analysis of facts, and evaluation of alternatives during the decision-making process, there is strong pressure to keep specialists involved in the decision process. In many cases, Downs wrote, each department of an agency has its own specialists assisting the people who are actually making the decisions. Moreover, there needs to be frequent communications between the producers and consumers of this data during the decision process.

Illustrated in Chapter 2 is a description of how to categorize uncertainties in the decision-making process and what specific actions can be taken to deal with this uncertainty. It is common, for example, to talk about the decision-making process as narrowing the range of uncertainty (i.e., about controlling uncertainty). It can be argued that many discussions of the decision-making process have a virtual fetish about the need to "control" the future and reduce uncertainty, while other writers ignore the issue of uncertainty. For instance, Aaron Wildavsky (as cited in Mintzberg, 1979) once referred to the decision-making process as follows:

> Planning (e.g., decision making) concerns man's efforts to make the future in his own image. If he loses control of his destiny, he fears being cast into the abyss. Alone and afraid, man is at the mercy of strange and unpredictable forces, so he takes whatever comfort he can by challenging the fates. He shouts his plans (decisions) into the storm of life. Even if all he hears is the echo of his own voice,

> he is no longer alone. To abandon his faith in planning (the decision-making process) would unleash the terror locked in him. (p. 203)

Downs (1994) wrote on several of these same issues of limiting uncertainty during decision making in his work, *Inside Bureaucracy*. He wrote that the decision maker would be forced to specialize in a specific area of decision-making expertise. Specifically, Downs writes,

> Whether a given official will exhibit the behavior (during decision-making) of a certain type depends not only upon his psychological proclivities, but also upon the behavioral requirements inherent in his position (within the decision group). Why do many rational men, strongly desiring to serve the public interest, nevertheless place disproportionate emphasis upon their own activities? The major answers to this question all follow from the specialization intrinsic to every bureau. (p. 103)

Downs (1994) addressed specialized information in the decision-making process. Downs then wrote that when a worker's efforts become highly specialized, he concentrates more and more of his energy in a relatively narrow spectrum of activities, acquiring a great deal of information about this particular spectrum. Because the needs and problems in his own area are vividly presented to him, they seem more real than those in other specialized areas do. This differential in information tends to exaggerate the relative importance of one's own specialty. The impact of this specialization can lead to a miscalculation concerning the characteristics and possible benefits for one's specialty.

This concept of "specialization" is closely related to the entire problem of sub-optimization, which has received a substantial amount of interest in public administration literature, particularly that material concerned with the decision-making process. For purposes of this dissertation, the term "sub-optimization" means that the individual

worker is focused on knowing a great deal of information on their particular assigned narrow work area at the expense of knowing how or why they participate in the overall general work organization or decision process. The concern of sub-optimized decision making in the defense department was addressed in the work *The Economics of Defense in the Nuclear Age* (Hitch & McKean, 1960). This work addressed defense decision making; however, it did not focus on the defense acquisition community. Their conclusions focused on the decision makers' ability to concentrate on the issue to be resolved by using information to make decisions solely from sources within a small and finite group.

This concept of a small decision making group is congruent with the writings of Irving Janus (1982), as exhibited in his work *Groupthink.* In this work, Janus described how decision makers sometime become so concerned with finding an acceptable decision based upon the seemingly arbitrary constraints, such as time, information available, and perceived stress, that the decision is not an effective decision but an approach to resolve an immediate issue without adequate discussion.

The argument contained in above approach to decision making by Janus (1982) specified a basic need for rational action for effective decision making; the individual making the decision should procure additional information so long as its marginal returns exceeds its marginal costs. However, this proposition is an empty statement unless we specify these particular costs and returns as depicted as the metrics of consumed time and money used in the decision-making process. As Downs (1994) stated, whenever there is great pressure upon a bureau to make a decision quickly, then several other steps are incorporated in the already wordy description of this process. He stated that the following

actions are also congruent with the situation in a large bureaucracy, such as the defense department's acquisition community:

> a. A minimal number of alternatives will be considered.
> b. Officials will tend to give primary consideration to alternatives that have been thought out in advance and are ready to go (be implemented)
> c. The decision-makers will try to restrict the number of persons participating in the decision, and the diversity of their views, as much as possible.
> d. If possible, secrecy will be used to restrict participation in the decision-making process. (p. 272)

Downs's (1994) concepts are found in the defense department's acquisition decision-making process. Before the impact of these actions can be discussed we must establish the environment in which the defense department's acquisition decisions are made; namely, we must establish the DoD acquisition decision-making environment.

Background of Defense Department Acquisition Decision Making

> Planning, organizing, staffing, and organizational development are the key functions of top management in any organization. It is my thesis that the top managers in the DoD have failed to perform these functions satisfactorily. Because of this failure, they have been forced to devote their attention to lower level tasks - operating, controlling and budgeting. (Thompson, 1991, p. 52)

The structure and process of defense acquisition has been changed several times since the inception of the Department of Defense in 1947. Prior to the 1960s, there was no central acquisition policy to guide the actions of the various military services in their acquisition process. Through the 1950s, the individual military services controlled their own acquisition programs with little regard for, or interference from, any central office in the Department of Defense. The military services would simply buy whatever they

deemed was necessary to fight individually the military conflicts at hand (Fox & Field, 1988).

President Eisenhower first recognized this dilemma and was appalled at the apparent inefficiency, redundancy, and inter-service rivalry involved in the procurement of new military weapon systems. He saw that there was no central plan or "vision" guiding the nation's collective military force procurement policy, and sometimes each military service duplicated the equipment and military capability of the other services (Institute for Defense Analysis [IDA], 1990). His solution to this problem was to discuss the matter with Congress, who then agreed with the President. The result of this discussion was that Congress enacted the Defense Reorganization Act of 1958. This Congressional Act directed the Secretary of Defense (SECDEF) to assign acquisition decision-making responsibility to the one specific military service that the SECDEF thought was most appropriate for making the procurement decision on that particular weapon system. This Act was the catalyst for the initial expansion of the role of the Office of the Secretary of Defense (OSD) into defense acquisition.

Thus Congress, by making a law which forced OSD to select the most appropriate military service to lead the overall DoD procurement decision-making process for a specific weapon system, was attempting to make the Secretary of Defense a strong central manager. However, due to the apparent lack of managerial skill at the position of Secretary of Defense through the decade of the 1950s, this leadership role as decisive acquisition manager was not immediately realized. Therefore, the intent of this Act was never fully exercised until Robert McNamara became the Secretary of Defense in 1961 (Fox & Field, 1988).

A significant change preceding McNamara's assumption of duties as the Secretary of Defense was the establishment of the formal program management structure within the military service's personnel assignment process. This change in the management structure of the department of defense formed the nucleus for all future defense acquisition (IDA, 1988).

This management structure as directed by the Defense Reorganization Act of 1958 centralized the control of program responsibilities, including those decisions pertaining to the development, production, and deployment, under the responsibility of a specific program office for each major weapon system (IDA, 1988). This program office was referred to as the "System Program Office" or as the "SPO." This office was usually found outside the geographical boundaries of Washington, D.C., and usually at one the individual military service's research and development centers. For example, the Air Force used Dayton, Ohio, as its SPO location for all aircraft acquisitions; the Army used Fort Rucker, Alabama, for all its aircraft acquisitions, and the Navy used Crystal City, Virginia for its aircraft acquisitions.

The manager of that SPO was called the "Program Director." The Program Director was directed by the service headquarters' senior decision maker and was called the Program Manager, who was responsible for the total weapon system and worked at the Pentagon. Having these individuals designated as responsible for an acquisition program was a change in the defense acquisition structure and established a process for an orderly and predetermined flow of communication and information to support the acquisition decisions during the entire lifecycle of a major weapon system. It also provided for the establishment of a centrally guided decision-making process from the

Office of the Secretary of Defense to the lead military service in charge of the acquisition. Previously these functions were overseen by several different government officials from several different organizations thereby causing significant problems for the DoD's attempt to make the decision-making process both efficient and effective. Having one program director responsible for all aspects of the entire program and responsible to one program manager who worked at the service headquarters to facilitate the decision-making process proved to be an exceedingly more efficient and effective method.

The efficiency of the streamlined and centralized decision-making process can be measured in time, and usually is measured in years that it takes for a major weapon system to proceed through all phases of the acquisition process. Along with this reduction in the time spent in this decision-making process comes the resulting possibility of a corresponding reduction of the total cost for the weapon system.

The Impact of This New Leadership at Defense

> Augustine's Law XIII: There are many highly successful businesses in the United States. There are also many highly paid executives. The policy is not to intermingle them. (Augustine, 1983, p. 112)

Robert Strange McNamara took the reins of the Department of Defense at the inception of the Kennedy administration, in 1961. McNamara was a former executive of the Ford Motor Company and practiced what had been referred to as active management (Fox & Field, 1988). This active management style was characterized by his desire to be personally involved in a quick decision-making process. He brought this quick and personal "commercial business" decision-making mentality to the Department of Defense from his previous position at Ford Motor Company. Other innovations that McNamara

brought to the DoD included the Program Evaluation and Review Technique (PERT), incentive contracting; the Planning, Programming, and Budgeting System (PPBS; Fox, 1989). All of these initiatives were intended to further centralize program management and specifically give to the Office of the Secretary of Defense both the technical and cost control for all major weapon systems in the defense acquisition process (Smith, 1982).

One of the first decisions McNamara made at the DoD was to install a new office of *Program Analysis* into the defense organization structure. He staffed this office with young talented, professional analysts who were nicknamed "*whiz kids*." The role of these whiz kids was to act as an independent evaluation group within the DoD and to challenge each acquisition decision as it was made.

It was later shown, however, that McNamara's commercial practices generated an increasing number of rules and regulations that seemed to bog down the decision-making system. The acquisition decision system bogged down because it required that senior individuals within DoD had to make all the final decisions on major acquisition programs. This concept resulted in mid-level decision makers fearing to make any decisions; therefore they "booted the decisions upstairs" to the Secretary of Defense. Thus, the decision-making process evolved to the point that only the Secretary of Defense was willing to make the final decision on the majority of the weapon systems as they went through the defense acquisition decision-making process (Gregory, 1989).

As a result of Secretary McNamara's impact upon the defense acquisition decision-making process, Congress lost confidence in him as a prudent decision maker and, by association, Congress lost confidence in the entire military procurement system as well (Gregory, 1989). In order to rectify the situation, during the 1960s Congress inserted

itself directly into the acquisition process. The most significant effect of this congressional action was the dilution of the specific weapon system program manager's authority. Instead of making the necessary decisions, the program manager's job was now, in effect, merely to be an advocate for the program to others who made the decisions. The program manager's advocacy role was accomplished by extolling the benefits and the accomplishments of his or her program to the new management tiers of decision makers inserted into the DoD structure. Additionally, the program managers were asked specifically by their military services to keep the congressional committees fully informed on the "status" of their programs in attempts to maintain the necessary funding and final approval for the program to proceed (Gregory, page 6).

The next review group after Congress in the mid1960s, to look at defense acquisition decision making was the Presidential mandated Fitzhugh Commission in 1970. The Commission's key finding was that continued inter-service competition and parochialism was further eroding the acquisition decision-making process. There were blatant attempts by the military services to "circumvent decisions, repeated efforts to reopen issues that have already been decided, and slow unenthusiastic implementation of policies to which the various Services objects" (IDA, 1988, p. I -7). As a means of solving this problem, the Commission recommended that the role of the Joint Chiefs of Staff (JCS) be strengthened in the overall DoD acquisition process. Specifically, the Commission recommended that the JCS be allowed to offer their own "joint perspective" input into the PPBS (IDA). This action can be viewed as part of the continual erosion of the military services as the focal point for defense acquisition decisions and another step in the centralization of the defense acquisition decision-making process.

In the late 1970s, there were several other commissions and reports that echoed the sentiments of the earlier Fitzhugh Commission. Collectively these commissions also made an assessment of the correct balance between the Joint Chiefs of Staff concern for national military strategy and the individual military service's influence in the defense acquisition decision-making process. However it was not until the beginning of the Reagan administration in the early 1980s when Frank Carlucci was appointed as the Deputy Secretary of Defense for Acquisition that the DoD recognized the true worth of linking the acquisition decision-making process to the formulation of the national military strategy (IDA, 1990).

In 1985, Carlucci convened an independent panel of defense experts to examine the total defense acquisition process. This panel concluded that the Office of the Secretary of Defense did not provide a conducive framework within which the Military Services' acquisition decision-making process could be properly coordinated and controlled. This 1985 report from the independent panel saw a need for linking defense strategy to acquisition decisions and for the construction of a DoD-wide *"road map"* that would look at the weapon systems in all military mission areas to avoid unnecessary and expensive duplication of weapon system procurement (IDA, 1990).

In 1986, President Reagan, bowing to resurgent congressional pressure for increased DoD reform, appointed the Blue Ribbon Commission on Defense Management. This panel was informally known as the Packard Commission, named after its leader, David Packard. The Packard Commission's report spelled out specific steps for a thorough overhaul of the defense acquisition decision-making process and specified, in even more detail than earlier commissions, the needed link between the formulation of

defense strategy and the acquisition of specific weapon systems (IDA, 1988). The Commission also advocated the creation of the Vice Chairman of the Joint Chiefs of Staff (VCJCS) who would be granted with specific authority to review the military weapon system requirements of all military services and the acquisition decisions made to enable those requirements to be meet.

Goldwater-Nichols Act of 1986

The Goldwater-Nichols Department of Defense Reorganization Act of 1986 was the culminating point for defense reform in the past 30 years. Probably the most significant change for the acquisition community was that now the Unified and Specified Command Commanders in Chiefs (CINCs) and the JCS were formally inserted into the acquisition decision-making process. In 1986, The Joint Chiefs of Staff gained a significant collective voice in defense acquisition decision making when the VCJCS was made the Chair of the Defense Acquisition Board. The Defense Acquisition Board was considered the supreme body within the Defense Department to make acquisition decisions. The intent of having the VCJCS as Chair of the Defense Acquisition Board, was to decrease the decision-making power of the individual military services and place more power with the "warfighters," as represented by the various CINCs and the JCS.

Changes mandated by the Goldwater-Nichols Act were beneficial to the defense acquisition decision-making process. However, it is possible to question whether the intent of the Goldwater-Nichols Act has actually been fully implemented or whether this legislation went far enough to enable the institution to be efficient and effective.

A Brief Outline of the Structure of the United States Military

The National Command Authority exercises authority and decision-making control of the employment of the armed forces through a single chain of command with two distinct branches. The first of these branches (decision pathways) runs from the President of the United States to the Chairman of the Joint Chiefs of Staff then directly to the operational forces. This branch is outside the intended scope and topic of this paper; therefore, it was not addressed in this dissertation; however, it is as depicted below:

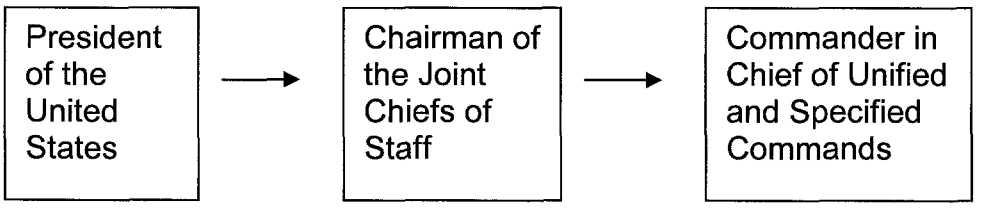

Figure 1. Illustration of the National Command Authority for Military Operations.

The second branch is focused within those officers and civilians who work in the the Pentagon. This pathway originates from the President to the Secretary of Defense then to heads of the individual military departments. Additionally, these officers coordinate with representatives from the Joint Chiefs of Staff and Office of the Secretary of Defense. This branch contains the pathway of decision making in the DoD acquisition community. This pathway for decision making is a central part of this dissertation and appears in Figure 2.

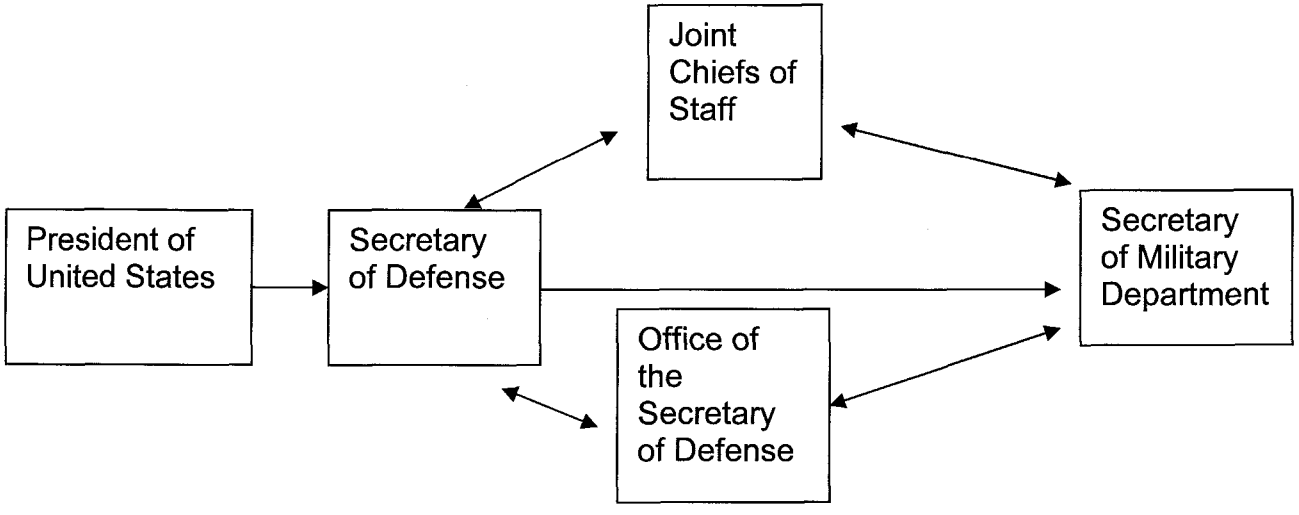

Figure 2. Pathway for defense acquisition decisions.

Military forces are organized today according to current threats as assessed by national intelligence agencies. However, today's threats are not necessarily the same threats that the nation will experience in the future, nor are national intelligence agencies able to predict with hundred percent certainties the future threats to the nation. Further complicating the scenario and closely tied to the challenges of predicting future threats are the changes that will develop. For example, there may be continued proliferation of nuclear, chemical, and biological weapons and the means to deliver these weapons of "mass destruction." With the increasing availability of relatively inexpensive cruise missiles and the capability to fabricate and introduce bio-toxins and chemical agents into the United States, "rogue" nations or non-state groups, such as "terrorists," may be able to threaten the United States homeland. This could pose a very serious and evolving security threat to the American people.

The process of decision making in the defense acquisition community needs to be tied to the strategic planning process for the defense department. It makes no military sense to have the acquisition community buying weapon systems that the defense planners have no plan or intent to use. Equally so, it does not make military sense for the strategic planners to be building plans for future military operations without a clear and accurate understanding of what equipment will be procured for the future force structure. So, if the DoD acquisition decision-making process is to be effective, there needs to be a "marriage" between the strategic planners of military operations and the acquisition decision making--but, how can that "marriage" objective be accomplished? Academic authors have written how decision processes should work and this dissertation

demonstrates how the DoD acquisition decision-making process could implement those insights into an effective decision-making model.

Organization of the Study

Chapter 1 presented the introduction to the theme of this dissertation on the impact of organization theory on defense acquisition decision making. Chapter 2 presented the review of literature. The purpose of this chapter is to examine the published theories from numerous academic experts. This chapter will set the foundation from which to analyze the merits of the defense department's acquisition decision-making process. Chapter 3 presents the DoD acquisition decision-making process: The purpose of this chapter is to illustrate the structure and organization of the DoD acquisition decision-making process. Chapter 4, influences upon the DoD acquisition decision-making process, enumerate the many influences upon the DoD acquisition decision-making process. Chapter 5 presents the case studies and analyzes three major weapon system acquisition systems. This chapter compares the intended design of the acquisition decision-making process (Chapter 3) with the realities of what really includes (Chapter 4) the process. Chapter 6 presents the summary, recommendations, and future studies for the DoD acquisition decision-making process and summarizes the issues found in the three case studies and presents the study's recommendations.

CHAPTER 2

LITERATURE REVIEW

> The student of administration must . . . concern himself with the history of his subject, and will gain a real appreciation of existing conditions and problems only as he becomes familiar with their background (White, 1967, p. 463)

The procurement of military weapons is a highly political process. The political process within the defense acquisition decision process is complex because of strategic and technological uncertainty, intense organizational competition, and the high stakes involved in DoD acquisition (Sidrow, 1983). This literature review chapter presents a systematic overview of the tenets of decision-making theory embedded within public administration. This chapter is divided into two major sections. The first section contains the evolution of the principles of decision-making theory in public administration and the second section focuses on authors of decision-making theories. From the foundation of this chapter a benchmark will be established to analyze in later chapters the DoD acquisition decision-making.

The Principles of Public Administration

The Formation of American Public Administration Decision Making

> Weapons procurement is only one phase of military management. Yet it is the key to peacetime military decision-making. (Stockfish, 1973, p. 273)

The beginning of Public Administration decision making stretches back in time to just before the American Revolution. The American colonies in the early 18th century

provided a fertile climate for the cultivation and the development of a different philosophy of government administration and the formation of a unique decision-making process (Mosher, 1976). In the words of our second President John Adams, in a letter to Hezekia Niles, in 1818,

> But what do we mean by the American Revolution? Do we mean the American war? The revolution was effected before the war commenced. The Revolution was in the minds and hearts of the people; a change in their religious sentiments, of their duties and obligations... This radical change in the principles, opinions, sentiments and affections of the people was the real American Revolution. (Letter Mosher, p. 3)

The changing principle to which Adams alluded to was the resistance and antagonism to the then-current approach to government administration, which he felt to be distant, oppressive, and beyond the control and/or participation by the general population. Article II of the United States Constitution begins with the sentence, "The executive power shall be vested in a President of the United States of the America." The meaning of the word "executive power," while only partially explained in the subsequent sentences, is implicit to include a decision-making process. In the Constitution, there is no amplification as to the need for or the establishment of a "staff" to assist the executive in making decisions. The word administration does not even appear in the founding documents of the American government system.

Article 1 of the Constitution enumerates in great detail the powers of the Congress. Nowhere in the Constitution or any of the other early documents is explained how this new government is to perform the decision-making process.

Other elements of administration missing from the Constitution include the critical functions of budgeting, organizing, planning, staffing, and controlling. These

omissions did not occur because the founding fathers were unaware of the necessity for administration or the necessity of making decisions. These critical functions did not appear because the framers of our nation wanted the administrative process to evolve from the practitioners of administration and not to be mandated. Benjamin Franklin wrote about the need for a "good administration" when he stated, "I hope, therefore, for our sakes, as a part of the people, and unanimously in recommending this Constitution, whenever our influence may extend, and our turn our future thoughts and endeavors to the meaning of having it well administered (Mosher, 1976, p. 4). Alexander Hamilton, in Federalist no.68, proceeded to assert that "We may safely pronounce that the true test of a good government is its aptitude and tendency to produce a good administration" (Rossitier, 1961).

The Development of Public Sector Decision Making

> Even though the decision-maker thinks he is using a rational process, organizational routines and procedures determine the type, quantity and relevance of the information he receives--information upon which the rational process depends. (Jefferies, 1977, p. 233)

Students of public administration who seek a solid foundation for their science find comfort and support in the previous statements of Hamilton and Franklin and in the words previously quoted from the Constitution. But Frederick Mosher (1976) offers a somewhat different perspective concerning the development of decision making from the early colonial period. Mosher believes that there were two categories of legacies of public administration from that era. The first category was a fear of public administration as a potential infringement on individual freedom and a threat of oppression of the general

populace (Mosher). His second legacy was an observation of the unwillingness for the early public administrators to settle matters--to make decisions, "once and for all" (Mosher, p. 5).

As portrayed by Mosher (1976), material written into the founding documents of the American administration system portrayed a concern about the possible "perils" of establishing a strong central administrative state. It was perceived that the founding fathers purposely chose not to address specifically what were the functions of an administrative staff, but instead chose to include a set of limiting factors to curtail the expanding growth of bureaucracy (Lane, 1982).

The product of the first of these legacies was a series of limitations, procedural safeguards, and various "checks and balances" placed on governmental activities. These products specifically included limits on the government power over its citizens, and checks from one branch to the other branches of the government (Mosher, 1976). From the standpoint of public administration, the guidance was more negative than positive; for example, the guidance stipulated what could not be done rather than what could be done.

Thee second legacy cited by Mosher (1976) contributed to the reason why the Constitution is so flexible and has endured throughout the ensuing 220 years. Through their wisdom in constructing this system of administration, the founding fathers made available the possibility of future innovation and experimentation as a means to govern. While the specific guidance written by the founding fathers in these early documents was slight, the general philosophy was clear and well established (Spanier & Wendzel, 1996). This early guidance contained the foundation for almost all of the subjects and issues that have now evolved into the field of public administration (Mosher, 1976). Therefore, the

strength of the decision-making process in public institutions has evolved from these self-imposed limits to fit the specific needs of today's environment with adaptation being the cornerstone of today's decision-making process.

Early Public Administration and Woodrow Wilson

> What is accomplished (or not accomplished) in national security is a reflection of the President's own political style and leadership ability. The best of policies and programs are considerably eroded by a President who is unable to inspire confidence, provide a firm sense of direction and manage his staff in developing cohesive policies. (Sarkesian, 1979, p. 332)

The beginning of study of public administration in the United States is traced to what is called the classical period of public administration which is marked by Woodrow Wilson's 1887 essay "The Study of Administration" (Stillman, 1996). The classical period of public administration is considered to be the late 1800s to the early 1900s. Wilson's definition of the field of administration stated (in the spirit of the then-growing reform movement) that the administrative aspects of government should be separated from the establishment, concerns, and implementation of political issues (Waldo, 1984).

According to Wilson (1887), public administration should be concerned solely with the "detailed and systematic execution of the public law" (Wilson, p. 212). Wilson further stated that political officials should be focused on the tasks of administration. Given this theme of separation of administration from politics, Wilson also suggested that the task of the public sector administrator was not significantly different from that task found in the private sector (Lane, 1982).

Wilson called for the development of a science of administration (Waldo, 1984). He envisioned that from this effort would develop the general principles to guide

practitioners to an efficient performance of their duties. Specifically, he envisioned these general principles would be based on a systematic and empirical analysis of the administrative functions embedded within the role of administrators (Rosenbloom, 2001). Wilson believed that the principles would be based on a comparative review of actions performed by all of types of administrators and this comparative analysis entailed an examination of administrative techniques successfully employed in other political settings of administration. To accomplish this task, Wilson envisioned that a review would include an analysis of the administrative practices of several foreign countries as well as administrative practices being accomplished by administrators in the private sector of America's business community (Stillman, 1996). The field of administration is a field of business. It is removed from the hurry and strife of politics. . . . It is a part of political life only as methods of a courthouse are a part of the life of society; only as machinery is a part of the manufacturing product (Wilson).

In the early 1900s, emerging scientific procedures were being proclaimed as the newest and best means to achieve desired administrative goals. Many of the techniques being suggested to improve the efficiency of public-sector decision-making processes were already being used in American private-sector business practices.

The Scientific Management Basis for Decision Making

Much of the systems literature leads to decision-making models or informal systems that fail because they treat organizations as closed systems, not appreciating that there is more than one way to solve problems, and that adjustments to the environment are not necessarily aberrations (Martin, 1989).

Two administrative approaches formed the dominant administrative theory during the classical period of public administration. These approaches were the Scientific Management Movement, founded by Frederick Taylor and the Departmentalists Movement, founded by Luther Gulick (March & Simon, 1958).

The Scientific Management movement focused on the individual worker's ability to increase efficiency through the performance of repetitive physical tasks. Thus science was "claimed" as the basis for a fundamental administrative theory (Rosenbloom, 2001). Taylor discovered the basic principles of time and motion study in the performance of all physical tasks and then through the analysis of these observations determined the "one best way" of performing any assigned task. Though these observations were in the private sector, Scientific Management attracted a large number of enthusiasts in the public sector (Fry, 1989).

The Departmentalists Administrative Movement formed by Gulick was a logical complement to the Scientific Management Movement. Whereas the primary focus of Scientific Management was on the performance of physical tasks, the Departmentalists approach was focused on the study of forming the ideal organizational structure to accomplish all assigned tasks (Fry, 1989). Accordingly, a basic tool of the Departmentalists approach was the formal and detailed organization chart (Rosenbloom, 2001).

The issue addressed by the Departmentalists Movement was the proper identification of all necessary tasks to enable the organization to achieve its objective. After the identification of these necessary tasks, the next step was assigning responsibility

of these tasks to specific groups of workers and coordinating those groups in a manner that would enable the organization to achieve these goals.

The lexicon of the Departmentalists is familiar to today's students of management and organizational theory. Terms such as "chain of command," "span of control," and "line and staff functions" were extremely common in the vernacular of this theory of administration. Additionally, there are other common terms equally familiar to today's students of administration. These basic terms of administration include "authority should be commensurate with responsibility," and the phrase POSDCORB (planning, organizing, staffing, directing, coordinating, reporting and budgeting; Shafritz, Hyde, & Rosenbloom, 1981; Stillman, 1996).

Both approaches to decision making can be found in the DoD approach to acquisition decision making and exist in two different groups in the defense acquisition decision process. One group of acquisition decision makers wants complete quantification of all variables. This group works mostly in the Office of the Comptroller, specifically in the Program Analysis and Evaluation office. This office was formed from the original "whiz kids" of the McNamara era (Enthoven & Smith, 1971). This office decides acquisition decisions based upon the methodology of cost-benefit analysis, and therefore this office often concludes there can exist only one correct and quantifiable answer. A second group of acquisition decision makers, from the Office of Acquisition and Technology, specifically individuals in the Defense Research and Engineering office, believes that acquisition decisions need to appreciate the total environment in which decisions are made, namely the political, economic, and military aspects of that decision. Thus, this second office maintains that there may not be just one best decision for each

situation. The dynamic process that forces the consensus building and melding of these two parochial views into a single DoD decision is illustrated in Chapter 4.

The Growth of Public Administration Decision Making

> The chosen structures and processes reflected the technologies, politics, economics, world events, and prevailing corporate culture of the times. Occasionally old patterns reasserted themselves in new forms; at other times, true innovations emerged. If history is a guide, the acquisition management journey will continue to both retrace old paths and blaze new trails in the years ahead (AF Acquisition Fact Book, 1998, p. 24)

During the Napoleonic era, European countries underwent a process that started them on a pathway of administrative proficiency. Prussia and Austria began legalizing administrative structures and processes many years before the United States. These countries were considered to be administratively very proficient (Dimock, 1967).

As the U.S. administration system matured, governmental functions evolved into the establishment of a more formal process. One example of this evolution is called "dual federalism." Dual federalism is a process where national and state governments had separate areas of operation; however, the majority of services provided directly to citizens come from the state government (Stillman, 1996).

The concept of "separation of powers" was a second factor that contributed to the development of effective U.S. administrative processes. An example of "separation of powers" is illustrated in the assigned roles of various administrative positions such as the President, state governors, city mayors, and various legislatures. Each of these positions has a finite list of responsibilities and authorities that cannot be shared with other elements within the government (Stillman, 1996).

The establishment of an administrative system was accentuated by the doctrine of "simplicity of the government work." President Jackson first stated this doctrine in his 1829 message to Congress, and is illustrated in the following quote:

> The duties of all public offices are so simple that men of intelligence may readily qualify themselves for their performance; and I cannot but believe that most is lost by the long continuance of men in office than is generally to be gained by their experience. (Richardson, 2000, p. 449)

Not everyone, however, was convinced that simplicity of government work as efficiency in administration was viewed as the best means to structure public administration. Dimock (1967) argued in his work, *The Frontiers of Public Administration: American Standards and Values*, the highest compliment that a government administration process can be paid is to be called "efficient." American citizens from 1900 to 1930 developed an attitude toward the term "efficiency" in public administration decision making nothing short of idol-worship.

The Impetus to Growth of the Decision-Making Process

> The essence of budgeting is that allocates scarce resources and hence implies choice between potential objects of expenditures. Budgeting implies balance and it requires some kind of decision-making process (Stillman, 1996, p. 348)

Franklin D. Roosevelt's administration's New Deal and the Brownlow Committee's 1937 report were a revolutionary change in getting things done (Rosenbloom, 2001). This paradigm shift involved the assumption of massive responsibilities by the federal government, particularly in areas of social and economic implications, that were unprecedented in American history. This shift of administration

responsibility made state and local governments far more dependent upon the national government (Fry, 1989).

During the New Deal, the federal government invented, extended, or adapted a great variety of administrative devices to meet problems that confronted the nation (Stillman, 1996). Examples of these administrative devices initiated include the following

1) governmental social insurance
2) a tax credit system to force state participation in unemployment compensation
3) work projects as a substitute for welfare
4) regulation of financial markets
5) government participation in regulation labor-management disputes
6) the beginning of fiscal policy, including deliberate deficit financing
7) a vast proliferation of grant programs to assist state and local governments
8) a government corporation for general regional development (e.g. TVA)
9) governmental payments for non-production in agriculture
(Mosher, 1982, p. 5)

The first New Deal programs violated almost every principle of administration espoused by earlier management movements (Stillman, 1996). The Roosevelt administration established new agencies for new programs independent of already established agencies operating in the same fields of endeavor. Personnel for the new agencies were hired without reference to the established civil personnel service rules and funds for the new programs were appropriated outside the regular budget process.

The consensus produced by the New Deal concerning the implementation of the new initiatives evaporated following the signature of the World War II peace treaties of 1945. Additionally, many of the Roosevelt Administration's initiatives in such fields as labor relations, price stabilization, health, and education were later defeated in Congress during the subsequent post-war period (March & Olsen, 1989). As in earlier post-war

periods, there was a push from the public sector practitioners toward the "good old days." Such a reversion was hardly realistic following World War II.

One critical impediment after World War II to going back to the "good old days" was the role that the United States assumed in the arena of world politics as a result of emerging from World War II as the pre-eminent Western power. This new role for the United States emerged from both its demonstrated military strength and its budding economic strength. This emerging international position of leadership was to guide United States foreign policy and defense acquisition decision making for the next twenty-five years (Sammet & Green, 1990). The evolving defense acquisition process also reflected the new position of the United States as a major player on the stage of global diplomacy. The defense acquisition process was now needed to acquire new weapons for the U.S. to maintain its new status as a world military power (Brown, 1983).

The Impact of the United States' Role in a Post-WWII Environment

> The main element of any United States foreign policy toward the Soviet Union must be that of a long term, patient but firm and vigilant containment of Russian expansive tendencies. . . . Soviet pressure against the free institution of the Western World is something that can be contained by the adroit and vigilant application of counter-force at a series of constantly shifting geographical and political points, corresponding to the shifts and maneuvers of Soviet Policy, but which cannot be charmed or talked out of existence. (Huntington, 1961, p. 39)

The legacy of the New Deal thinking carried over also to the fields of public administration, institutional organizing, and decision making. The Brownlow Commission Report, written in 1937 during the first Roosevelt Administration, was the dominant source of new ideas on the efficient practice of public administration (March & Olsen, 1989). There were many changes and developments during the Truman years,

some of which contained important adjustments to public administration policies. Yet, few of them added significant achievements in thinking and philosophy about the functions of administration.

The Hawthorne experiment brought the human relations movement into American mainstream (Ott, 1989). This budding approach to public administration brought with it a new perspective on how decision-making process should be accomplished. The sociologists had discovered, translated, and even challenged the writings of Max Weber's analysis of bureaucracy (Ott). Some economists, fresh from their triumphs in macro fiscal policy recently experienced in the planning and controlling of resources used during World War II, were delving into the analysis of public policies programs. Another impact from World War II was that American society was now more aware of how other nations were structured and a confidence vis a vi with our foreign trading neighbors (Spanier &Wendzel, 1996), which meant that the United States was to remain as a major player in future world political, economic, and military events and therefore must be fully prepared, equipped, and determined to fully participate and succeed in that role.

During the 1940s, authors wrote on the importance of public administration. For example, "Dwight Waldo explored the political theory within public administration, Paul Appleby asserted that administration was a political process, and Norton Long stated that the lifeblood of administration is power--the very essence of politics" (Rosenbloom, 2001, p. 162). We shall now explore other important administration theories.

Decision-Making Theories

Some public administration scholars documented the process through which decisions are made, while others chose to describe the process through which decisions are implemented. As Fry (1989) writes in his work, *Mastering Public Administration*, the *behavioral* approach in public administration sought to modify the hierarchical organizational structures espoused by the *classical* writers. The *classical* approach urged a restricted span of control to ensure close supervision. The *behavioral* approach suggested a wider span of control to allow sufficient latitude for the expression of initiative and self-control on the part of the worker. The *classical* authors demanded centralization of administration functions in the search for control and coordination of the process. The *behavioral* authors insisted on decentralization of these same administration functions in order to give members of the organization a greater sense of control over their destinies (Fry).

These observations were further developed by these authors who wrote on decision making: Dwight Waldo, Luther H. Gulick, Mary Parker Follett, Herbert Simon, Charles Bernard, Elton Mayo, Max Weber, Richard J. Stillman II, and Graham Allison.

Dwight Waldo. "The 'new public administration' whatever it might later prove to be, was not yet embraced by the operative authorities in the American government system--namely public administrators" (Mosher, 1976, p. 163).

Dwight Waldo turned the direction of public administration (Rosenbloom, 2001). In the summer of 1968, when radical politics were at their high-water mark on American college campuses, Waldo arranged for a conference of "young" public administrators to

express the ideas that was called the "New Public Administration." This conference was held at and took its name as the Minnowbrook Convention. Marini (1971) writes about this conference in *Toward a New Public Administration: The Minnowbrook Perspective*:

> There was considerable diversity among the papers that were delivered. However, the general thrust was toward a "relevant" administration that is more interested in adaptability, confrontational decision-making, and client interests than toward traditional positivists and removed forms of study. (p. 137)

In the work, *Public Administration in a Time of Turbulence*, Waldo (1971) edited a set of papers collected from several panels he had organized at the American Political Science Association convention of 1969. The goal of his book was to carry forward the evolving Minnowbrook ideals (Stillman, 1999). Kaufman described the new public administrative movement as a movement toward greater "representation" of all elements of American society into public administration (Waldo). Orion White described this new public administration movement as a heightened interest in decentralization of the formal decision-making process (Waldo).

Frederick Thayer. Jeffries (1977) states,

> Organizations have interests. Career officials in these organizations believe that protecting these interests is vital to the security of the United States. They therefore take stands on issues, which advance these interests and maneuver to protect these interests against organizations and senior officials. . . . (Jefferies, 1977, p. 234

In *An End to Hierarchy*, Thayer (1973) argued that political theory had grown beyond a strictly hierarchical form of administration. The decision-making process was a structure that produced competition among the various workers with each individual competing for the cherished decision making position. Thayer wrote that the arguments to

improve research in public administration and policy looked to the social science disciplines as models of what should be done (Thayer). Additionally, Thayer stated that public administrators should adopt a more fluid form of organization based on collective decision-making and that it was necessary to adopt the new "paradigm" before a crisis developed in the public sector.

This need to adopt a new, more fluid form of organizational structure based on a more flexible form of collective decision making had been addressed some 30 years before Thompson Tuden (1959) in an essay entitled, "*Strategies, Structure and Processes of Organizational Decision.*" Its theme focused on the need for decision makers to be responsive to the whole open environment in which decisions are made. Thompson and Tuden wrote about the need for computational decision-making strategies that could take place within an organization, when situations exist where there is agreement on preferences for the possible outcomes and agreement on beliefs as to the causation of why the decision needs to be made. Bargaining decision-making strategies take place in situations where there is no agreement on preferences about the possible outcomes but agreement on the causation for the need to make a decision. The computational strategy is reflective of a bureaucratic structure, for example the Defense Department, and the bargaining strategy is reflective of a representative structure, for example the Congress (La Palombama, 1963).

Luther H. Gulick. According to Farrel (1997), "The (military) services seek to protect their 'organizational essence' by exercising their autonomy, and by maintaining

and enlarging their functions and the resources necessary to carry out these functions" (p. 70).

Luther H. Gulick is known as the "Dean of Public Administration" (Fry, 1989). Gulick's work reflects the emphasis of the reform movement of the early 20th century and his ideas supported many changes in the field of public administration. The common objectives in his writings focus on achieving "efficiency" in public-sector organizations and the nobility of public service (Stillman, 1999). Gulick emphasizes that "efficiency" is possible in public institutions through organizational consolidation and the integration of the various managerial functions and "denies the separation between politics and administration" (Lynn, 2001, p. 157). He also stresses "efficiency" can be achieved by the centralization of decision-making to enhance executive power (Fry, 1989). Additionally, Gulick offers the need to strive for a "professionalization" of the workforce as a means to increase their work effectiveness and efficiency (Fry). He states that "professionalization" of the workforce could be best attained through educational certification endeavors and having the workers attend professional conferences (Fry)

Mary Parker Follett.

> The best of policies and programs are considerably eroded by a President who is unable to inspire confidence, provide a firm sense of direction and manage his staff in developing cohesive policies. In sum, national security policy is in no small measure a direct reflection of the President's leadership. (Sarkesian, 1979, p. 17)

Another classical author on leadership in the decision-making process was Mary Parker Follett. Follett's conceptions of "authority and control" redefined the previously accepted definition of effective leadership in the organization (Snider, 2000). She

illustrated a different kind of leadership image than the general pattern outlined by Gulick. Follett argues leadership is ineffective without the understanding and acceptance by the officeholder responsible for implementing the results of the decision-making process (March & Olsen, 1989).

Follett (Ott, 1989) noted that there was a trend in the decision-making process of large organizations for workers to "specialize" in certain areas of technical competence. As a result of this specialization, individuals who are adept at making decisions are usually placed in an organizational position, having the authority to make even more decisions with the growing number of technical experts assisting in the decision-making process (Fry, 1989).

Follett counsels readers that the knowledge of the expert should be co-located with the knowledge of the executive and together, through their combined efforts, the decision-making process should proceed. She states that the opinions of either participant in this decision-making process are not dominant over the opinions of the other nor should they coerce one another, but they should engage in the decision process by means of integration (Fry, 1989).

Herbert Simon. According to Sidrow (1983),

> Recognizing the importance of individuals-acting-in-organizations is particularly important with respect to the unique role of the Presidency in weapons acquisition. Although the President's actual power may be quite limited when considered over the whole of an acquisition program, no one in government is better suited or positioned to define the context within which weapon decisions are made. (p. 192)

Simon's written works are firmly entrenched in the *behavioral* perspective of public administration and there are also many similarities between Simon's positions and those of classical authors who preceded him (Lynn, 2001). At the macro sense, Simon shares with the *classical* approach the objective of developing a science of administration (Snider, 2000). He seems to be on a quest for general principles of administration through the acceptance of efficiency as a criterion for decision making in an appropriate hierarchical organizational structure (Stillman, 1997) Simon argued that the science of administration should be founded on the premises of effective administrative decision making (Stillman). He defined effective decision making as the means to reconcile the rational-choice model of economic theory with the then-emerging findings on human behavior factors in the organization (Fry, 1989).

The distinctiveness of Simon's writings lies in his attention to the decision-making process within the organization (Dequeci, 2001). He proposes a new scientific approach, which he calls "*the decision premises*" (Fry, 1989). This is a revised concept of the "decision maker" that he labels the *Satisficing Man (*Fry). Satisficing man is a decision maker who does not seek the perfect solution, but, is able to make timely decisions that allow for achieving modest results (Fry). Simon (1976) included these ideas in, *Administrative Behavior,* when he drew many of his ideas from the academic disciplines of economics, psychology, and sociology.

In his book *Models of Man*, Simon (Fry, 1989) presents a formalization of some basic elements of his decision theory, including his concept that the human being is capable of decision making, but that the human decision-making process cannot be found elsewhere in science (Fry). In his work *The New Science of Management Decision,* Simon

presents a computer-based approach to decision making and an assessment of the computer's consequences for organizational decision making (Fry). In another work, *The Sciences of the Artificial Intelligence,* he expands his scope to artificial intelligence systems in general and a model of man as an information-processing system (Fry).

Simon's focus on the human decision-making process has clear and direct relevance to the topic of this dissertation. He observes the importance of dominant personalities and the influence of their motivation in organizational decision making (Stillman, 1996). A key theme of Simon's literature is his appreciation for the need of the organization to maintain a good communications system (Meier & Bohte, 2000). Simon states that without this communication system the necessary flow of data to the decision maker will not be effective, thus rendering the entire decision process in chaos (Fry, 1989).

Charles Barnard.

> Because of the nature of the information a congressmen gets, the Armed Services Committee is typically less concerned about the question of how much we are buying in defense than the question of why we are buying it. (Aspin, 1973, p. 91)

Another author who has written on the need for effective communication is Charles Barnard. Barnard identifies three basic organizational activities necessary for effective administration functions to survive: (a) inducing a willingness for participants to cooperate, (b) establishing and defining organizational purpose, and (c) establishing an effective communication system (Fry, 1989). These activities are very similar to those found by Mayo at the Western Electric Company (Stillman, 1996).

Taking each of Barnard's three issues in turn, it can observed that the first requires inducing a willingness on the part of all organizational workers to cooperate together to

meet the organization's goals. This procedure involves establishing a system of incentives for workers who participate in the decision-making process (Fry, 1989). The second necessary organizational activity is the "subjective aspect" and involves the recognition and appreciation of understanding the motives of individual workers. According to Barnard, the subjective aspect of purpose is directly related to the incentive system, while the cooperative nature of understanding individual worker's motives is related to organizational decision making (Fry). Communication, the third element, is important both in conveying the purpose of the organization and in the exercise of authority (Fry).

Barnard (1938) stated, "Decisions are as actions of individuals . . . which are the direct result of deliberation, calculation, and thought . . . involving the ordering of means to an end" (p. 185). Barnard suggested that there are two major categories of decisions, namely personal decisions and organizational decisions. Personal decisions are decisions about whether or not to participate in the goals of the organization (Fry, 1989). Barnard states that personal decisions are made outside the function of organizational goal attainment activity and therefore, these decisions cannot be delegated. Furthermore, personal decisions are not likely to be the product of logical thought; however, these decisions do impact the formal organizational decision-making process because they affect the individuals who are a part of the organizational decision-making process (Stillman, 1996).

Organizational decisions, in contrast, are decisions dominated by organizational purpose and not focused on personal considerations. As such, Barnard (1938) argues that organizational decisions should be delegated to the most appropriate level of management within the organization's structure (Fry, 1989). He proposes that leaders best make

organizational decisions at pre-designated "communication centers." He defines these "communication centers" as a formal location within the organization where there exists an adequate technological capability to maintain the necessary and timely flow of communication and information from which the decision can be made (Fry).

Barnard does not elaborate on the necessary particulars of technological databases necessary to make decisions. This concept of necessary data to make decisions assumes that requisite information will be available during the decision-making process. (Rosenbloom, 2001). The need for and availability of necessary information is an extremely important point and Barnard is stating that the individual does not have to be a technical expert--but rather that the decision-maker should be an expert at making "organizational decisions" (Fry).

Bernard also believes the process of decision making in organizations is specialized (Ott, 1989). For instance, decisions that are made at the upper managerial levels of the organization are more focused on the ultimate goals of the organization and those decisions made at the lower level of the organization address the means to achieve those prescribed goals. Consequently, the efforts of most individuals in the organization are guided by decisions that are made by organizational executives who, according to Barnard (1938), act "impersonally"--their decisions are dominated by organizational objectives vice personal choices.

Bernard (1938) wrote that the specific process of organizational decision making depends on three factors: the purpose of the decision, the speed required in making the decision, and the quality of information available to the decision-maker (Fry, 1989). He maintains that if the purpose of the decision process is to ascertain truth, the process itself

must be logical. If the purpose of the decision is to determine a course of action, Barnard argues that too many intangibles are likely to be involved and thus the process cannot be totally logical. If the purpose of the process is persuasion, the process requires rationalization but is ultimately non-logical in character (Fry). The second factor determining the decision process employed is the time available before the decision needs to be made. If the time available is short, then logical processes cannot be fully employed in the process.

Finally, the exact process of decision making is also a function of the quality of the information available to the decision maker. Precise information permits the use of predetermined logical decision-making processes. In the opposite case, uncertainty necessitates the use of non-logical decision processes. It therefore follows that, any organizational decision making that involves choosing courses of action or persuasion, that must be performed in a short timeframe and is based on imprecise information will require varying degrees of non-logical processes (Fry, 1989).

Frederick Taylor.

> An adverse acquisition trend is the extreme difficulty in getting the services to accept the application of new technology, when the new technology would alter traditional service roles. . . . This reluctance to apply new technologies to nontraditional equipment and missions contrasts strikingly with the services' enthusiasm to apply advanced technology to traditional equipment and missions, for example, a faster plane, a more heavily armored tank, of a bigger ship. (Gansler, 1985, pp. 388-389)

Another noteworthy author of decision-making theory was Frederick Taylor, becuase chronicles of U.S. contributions usually begin with Frederick Taylor (Morgan, 1986). Taylor's thoughts were founded on the premise that administration should be

separated from political concerns (Fry, 1989). His concepts were congruent with Wilson's in that the definition of administration should be limited to, in the words of Woodrow Wilson, "the detailed and systematic execution of public law" (Wilson, 1887, p. 76). Taylor argued that by taking politics out of administration, a generic administrative function, namely, the appropriate ordering of ends to means, has been identified. Therefore, it was permissible to search for general administration techniques in the private sector if it could be used to enhance efficiency in the operation of American government. With this charge, attention turned to the techniques of scientific management, which were concerned with the question of efficiency in the administration of public administration.

Scientific management attracted the enthusiastic support of many in government who believed that those techniques could be applied in the public sector. Frederick Taylor is famous for his work on the scientific management approach to administration (Stillman, 1996). He thought the techniques of scientific management were directly applicable to the public sector, since, in his judgment, the average public employee did little more than one-third to one-half of a good day's work (Fry, 1989).

Alan W. Lerner. "Like most policy areas, weapons acquisition is a political process in that it is about determining the appropriate allocation of limited resources" (Farrell, 1997, p. 11).

Lerner (1976) addressed the problem of defining the parts of decision making in his book, *The Politics of Decision-Making: Strategy, Cooperation and Conflict.* He emphasizes the very troublesome "problem" (his word) of politics within decision

making in the public arena in which he states that the essence of this dilemma is focused on the understanding of the impact of the nominally apolitical experts in the decision making politics.

Understanding the impact of experts in basic decision-making situations is controversial because there can be disagreement over the definition of "expert." However, most writers agree that, in principle, an "expert" is someone who is better informed on the assigned topic of discussion or more skilled at convincing others that he is better informed than are the others. Experts are generally perceived to be "experts" because they possess superior skills, information, or have gained pertinent experience in the arena at hand.

In the military, an expert may be titled as "expert" as a function of their particular "rank" or position in the organization. For example, a military person of the rank of "General Officer or Admiral" may be considered an expert because he or she is a "General" or "Admiral." Some experts may gain their "expert" status on the basis of skills or performance shown after joining a specific group. For example, in flying an aircraft, a fighter pilot may become an expert if he and/or she constantly display abilities considered important by other fighter pilots. Still others may gain "expert" status by a unique experience. For example, an astronaut who has traveled into outer space may be rendered "expert" status in topics dealing with space travel because of having the benefit of the requisite training and the unique experience of space travel. Lastly, an individual who has already made decisions concerning the acquisition of important defense related weapon systems may be considered an "expert" by less experienced, but no less skilled, individuals.

Individual Motivation for Decision Makers

The fluidity of movement of expert decision makers into and out of the defense acquisition community has an impact on the decision-making process. An individual may be motivated by long-term goals that are more centered on personal growth or future employment than on the formulation and implementation of the public organization's policy strategy. The inclusion of this dimension of personnel movement figures significantly in the decision-making process and is considered to be a fairly important part of that process (Lerner, 1976).

The impact of this movement of individuals in the decision-making process alerts the DoD to several possibilities for the decision making groups. First, individuals who are going to design a decision making group could tend to seek group members with whom they are compatible so the direction of the coalition formation will receive its first nudge along the lines of interpersonal compatibility. Second, if we assume that the division of labor in this setting is somewhat fluid, often fluctuating with the agenda, temporary factions will form within the context of the larger total group. Given this phenomenon, these alliances are often based on friendship and may fare better than otherwise expected.

Of course, it follows that bad relations could counter good relations and spoil potentially productive subgroups as a result of antagonisms in group relationships. This possibility is apparent in the DoD, where many of the same members of one committee participate with the same people in other meetings. This could result in a situation whereby a stoppage in the decision process in one committee may have an adverse "spill-over" impact on the decision-making capability of another committee as interpersonal relations become strained over the initial disagreement in the first group.

An important element of that interpersonal relationship is the role of the "expert" within the group. Therefore, a definition of the term "expert" is offered as a function within the decision-making process:

1) Expert for the day, who by accidental circumstances holds exclusive information on a single issue of importance to others in the group.
2) Experts recruited for long-term affiliations with the organization who are destined to resign but who at this time, have not come to that realization of resigning.
3) Experts who were recruited according to a job description that were not accurate or whose duties has eventually been changed in character because of institutional reorganization or redirection.
4) Experts who inject themselves into political matters because of ideological motivations and whose attempts to exert influence in the decision circles are destined to failure because they can not take the heat that will develop.
5) A knowledgeable and informed individual who has risen as part of the personnel system within the institution and has attained the knowledge to make an informed (and hopefully reasonable) decision.
6) The political appointee, who was placed in a position to make decisions as part of a reimbursement for past favors; or, due to the sensitivity of the position, the senior leadership of the institution needs to inject an element of political flavor to the discussions. (Lerner, 1976, p. 107)

Lerner (1976) states that the more the group is collegial, the less there are explicit, formal "authority distinctions" among the various members of the group that can cause a dysfunction to effective decision making (Lerner). He defines authority distinctions as official titles and powers, which establish a superior-subordinate hierarchy that can differentiate members (Lerner).

Whenever the decision group is comprised of junior and senior members, and is part of a large-scale formal organization such as the defense department, there are opportunities for the misuse of patronage. It is important that patronage is not defined in a narrow sense of jobs to be allocated, but more in the broader sense of possibilities of any favors or benefits the leader could dispense to members of the group. These perceived

benefits may include choice committee memberships in exchange for the cooperation during the decision-making process. Patronage is a form of payment and individuals at the top of the bureaucratic structure are in the best position to offer such payments and hence, enjoy an advantage in the decision process (Lerner, 1976).

Anthony Downs.

> After the decision is made--using the information limited by organizational processes--organizations again influence the policy because organizational repertoire, program and standard operating procedures determine (a) which choices the decision-maker has in the way of policy options, and (b) how the decision will be carried out (Jefferies, 1977, p. 233)

Anthony Downs believes that organizational decision making is different from individual decision making (Heineman, 2000). Downs states in *Inside Bureaucracy* that decision making in large organizations differs from that decision-making process conducted by a single individual for the reason that it involves many persons instead of just one person (McCurdy, 1991). As a result of this observation, the following considerations should be addressed when viewing the decision-making process within a large organization:

1. Different people carry out the various steps in the decision and action cycles. Therefore, there is an even greater importance in the ability of the decision making group to inform the implementers of exactly what actions are to be accomplished and specifically what actions are to be avoided.
2. An organization must generate numerous conflict controlling and consensus creating mechanisms because its members have widely varying perception apparatuses, memories, images of the organization (and the world), and the goals of each of the previously mentioned.
3. Organizational decision making involves the following significant costs of internal communication that have no analogies within the decision-making process of a single individual decision maker:
    a. Losses of utility due to the errors in the transmission.

b. Losses of utility (for the ultimate users of the data) due to the distortion in the communication.
c. Resources (especially time) absorbed in internal communications.
d. Losses of utility due to the overloading communications channels in the short run. (Downs, 1994, p. 178)

Organizations have advantages over individuals in the decision-making process. Organizations have a much greater capacity to carry out all the necessary data-gathering steps in the decision-making process and in the subsequent implementation of these decisions. Organizations have the capacity to build extensive internal specialization, which is seen in the defense department acquisition process where many of the decisions are focused on the technical aspects of sophisticated weapon systems. Organizations have the capacity to maintain a diversity of viewpoints, critically important while in the discussion phase of the decision-making process, as a means to lessen the uncertainty of a possible decision (Downs, 1994).

It is the prerogative of the leader of the group to decide what is the level of acceptable uncertainty in any decision and what power the senior decision maker has in establishing and maintaining decision group dynamics. The less the perceived importance of the decisions involved, the more likely that the decisions will be made by previously agreed to rules. This decision process follows from the desire of higher authorities to reduce their workload by eliminating the need to continue a formal decision-making process for decisions that possess a perceived low political and or programmatic consequence. Thus, the three ranges of a decision's importance can be discerned: (a) decisions too trivial to cover with rules, (b) decisions covered by previously published

rules, and (c) decisions that are too important to make without prior review by higher authorities of the decision making group (Downs, 1994).

Downs (1994) wrote in his work, *Inside Bureaucracy*, descriptions of the other models of decision-making process. He describes how in economic theory, there are long-standing debates between theorists who believe that decisions are made and hence change is affected in a process of utility maximizing and those who believe changes are made in a process of utility satisficing or disjointed incrementalism. His theory combines these elements from these approaches.

Because the decision-making units in his theory are individuals, Downs's (1994) research is focused upon the individual officials rather than upon the bureau as whole. Because the decision makers are the utility maximizes, they are always willing to adopt a new course of action if it promises to make them "better-off," even if they are relatively happy at present (Scheps, 1995). However, they cannot search for a new course of action without expending resources. Since the supply of these resources is limited, they tend to avoid further search whenever the likely reward seems smaller than the expected marginal costs.

Within this framework, Downs (1994) posits the following hypotheses:

> 1) A tendency for the official to move toward a satisfactory decision,
> 2) A constant stream of new inputs into the decision-making process (both from an environmental obstacle standpoint and from new data) displace the decision maker from an equilibrium and thereby initiates him to search for alternative solutions, for example decisions,
> 3) A process by which he continually redefines the locus of his equilibrium position to reflect his recent experiences regarding what types of decision are really possible. (p. 171)

Graham T. Allison.

> Allison presents a vision of government machines' grinding out decisions, which have little to do with the values and purposes of so-called decision makers. Although the machine may feed on their values and purposes, it does so according to a dynamic all its own. (Steiner, 1977, p. 394)

In *Essence of Decision: Explaining the Cuban Missile Crisis,* Allison and Zelikow (1999) provide insights into the DoD decision-making process with an historical case study on the Cuban Missile Crisis. Allison offers three models to analyze how decisions are made: (a) rational actor, (b) organizational process, and (c) governmental politics. The template over which these models are discussed is the response of the United States to the then Soviet Union placing strategic missiles in Cuba during 1962. Allison's and Zelikow's analysis and conceptual models have attracted an active following in the field of foreign and strategic affairs, domestic public policy, sociology, organization theory, international development, and public administration (Brower & Abolafia, 1997).

The first model, *rational actor* (sometimes called the "classical model"), offers the premise that there exists a predetermined formal structure to the decision-making process. This model suggests that a unitary actor through rational processes decide government policy (Sidrow, 1983). The *rational actor* model states,

> Large acts result from innumerable and often conflicting smaller actions by individuals at the various levels of the bureaucratic organizations in the service of a variety of only partially compatible conceptions of national goals, organizational goals, and political objectives. (Allison & Zelikow, 1999, p. 6)

The second model, *organizational process*, is a means to address a problem through a detailed path of procedures and organized through a detailed plan. At the core of the *organizational process* model is the view that decisions are the outputs of complex

organizations (Sidrow, 1983). Allison and Zelikow (1999) define this methodology of decision making as: follows

> To perform complex routines, the behavior of large numbers of individuals must be coordinated. Coordination requires standard operating procedures: rules according to which things are done. Reliable performance of action that depends upon the behavior of hundreds of persons requires established programs. (Allison & Zelikow, p. 68)

The third model for decision-making is the *governmental politics* model. According to Alison this model most closely resembles how decisions are made, and is illustrated by defense department operations during the Cuban missile crisis.

Governmental politics sees no unitary actor but rather many "players " in the decision-making process among whom no one individual possesses dominating influence or power (Sidrow, 1983). Alison writes that this third model's "grasp of governmental action as organizational output, partially coordinated by a unified group of leaders, balances the *Classic model's* (model one) effort to understand government behavior as choices of a unitary decision maker" (Allison, p. 144). Model three identifies no single decision-maker but a group of decision makers, which through a comparison of their positions reach consensus for the good of the whole organization.

This approach to decision making is congruent with Charles Lindblom's theory of "muddling through" the decision-making process. In his theory Lindblom articulates that decisions result from a convoluted process whereby they are formed by a series of compromises between the competing leaders and that the overall process takes a long time to get to final decision.

Allison uses model three, *governmental politics,* as the illustration of how decisions are made at large public institutions such as the Defense Department. He states,

"There is apparent incompatibility between the level of discourse in the model one account and that of the model two and model three accounts" (p. 248). Allison offers an opportunity to consider what methodology is used when decisions are made. This is an important concept and complements the work of Janus (1982), who established his theory of *Groupthink*. Janus articulates there is a danger in the manner in which a group approaches making a decision. Janus's work, as illustrated in *Groupthink*, offers insights to decision making with potential methods to preclude the bandwagon appeal that was labeled as the *Groupthink* mentality, which allowed "bad" decisions to occur (Ott, 1989).

Lee G. Bolman and Terrance E. Deal.

> The real goal of defense policy, after all, is to secure the nation against harm from abroad, not to provide economic benefits to one segment of the population (although the later is an unavoidable consequence); this is the classic "public good" notion of defense spending. But the inputs that constitute "defense" do not appear out of anywhere--the defense budget produces millions of jobs, a benefit, which naturally leads to the creation of extremely powerful political coalitions. (Mayer, 1988, p. 346)

Behind every effort to improve an organization lies a set of assumptions or theories about how organizations work and what might make them work better (Bolman & Deal, 1997). Bolman and Deal focus on four "organizational frames" for analyzing decision-making. Specifically, each of these frames offers a different perspective on what leadership is and how it assists the decision-making process in organizations.

The first frame is called the *political frame* (Bolman & Deal, 1997). The organization's purpose is to properly allocate the scarce resources, both people and funding, to achieve the institutional goals. Key words to describe this framework for decision making are power, authority, bargaining negotiation, and influence (Bolman &

Deal). The organizational theory most closely aligned to this approach is Allison's, third model, *governmental politics.* The academic discipline most closely aligned with this organizational frame is political science.

The second organizational frame offered by Bolman and Deal (1997) is the *symbolic* frame. The organization's purpose in using this frame is to provide meaning to the activities of the organization. Key words that describe the interactions of this approach to decision making are culture, symbols, rituals, and stories. This is an approach to solving problems that focus on the ambiguous, not the rational; it focuses on expectations and not on the product (Bolman & Deal). Anthropology is the academic discipline most closely aligned with this frame.

The third organizational framework is the *structural frame (*Bolman & Deal, 1997). The organization's purpose here is to achieve the assigned goals and objectives of the institution. Key words that describe this approach are rational, functions of groups, planning, executing, and tasks. The decision-making theories that most closely align to this framework are by Taylor, Weber, Lindbloom, and Allison's first model, *rational actor.* The academic discipline most closely aligned with this frame is sociology.

The fourth and final frame offered by Bolman and Deal (1997) is the *human resource* frame. The organization's purpose is to answer the needs of the people of the organization. The key words of this frame are people, group dynamics, motivation, empower, process, and consensus. The major organizational and decision-making theories most closely aligned with this frame include theories developed by Maslow, McGregor, Herzberg, Barnard, and Allison's model number two, *organizational process.* The academic discipline most closely aligned with this frame is psychology.

From this review of decision making literature, this dissertation transitions to an examination of how the DoD is organized to make acquisition decisions for major weapon systems. The defense acquisition process is complicated and expensive as evidenced by the following quote:

> Buying for the Defense department is the biggest business in the world, about $688 million a working day, or $178 billion a year--greater than the combined purchases of IBM, EXXON, and General Motors. The buying process neither starts with the purchase nor ends with it. Buying is merely one step in a multiple-step decision-making process called acquisition management. It starts with an intelligence assessment, which then triggers a capability need, followed by an acquisition strategy that eventually puts into the hands of the troops the equipment that they need, maintain, replace over many years, and finally dispose of. The never-ending cycle begins again. (Sammet & Green, 1990, p. xi)

The defense acquisition process is designed to enable the DoD to achieve its vital goal of providing modern, high-performance weapon systems and support America's fighting men and women in less time, at lower cost, and with higher performance capabilities (Cohen, 1997b). This federal department's acquisition organization is structured to support a defense acquisition strategy that hinges on having acquisition polices and practices that ensure faster, better, and cheaper access to the tools men and women in military uniform will need to prevail in an era of new, highly unpredictable security challenges. Yet despite these changes in challenges, the DoD continues to rely on acquisition processes, organizations, and infrastructure largely developed in the years following World War II. Moreover, the DoD continues to face a limited investment budget constrained by a relatively stable top-line budget and squeezed by increased operations and support costs from aging weapon systems which compete within the DoD for those same fiscal resources.

Defense acquisition is an important element in our nation's security and it is an elaborate process based upon the important uses of the purchases. Thus it is worthy of study because the large amount of monies spent and the necessarily strict oversight of that spending is necessary because it maintains the security of the nation and the funds spent are public monies, which compete with other domestic priorities.

CHAPTER 3

THE DoD ACQUISITION COMMUNITY DECISION-MAKING PROCESS

> It costs 75 cents to kill in Caesar's time. The price rose to about $3000 during the napoleonic wars; to $5000 in the American Civil War; and then to $21,000 per man in the World War. Estimates for the present war indicate that it may cost the warring countries not less than $50,000 for each man killed. (Senator Homer T. Bone, *Reader's Digest,* February 1943)

Background

> The weapon acquisition cycle is supposed to begin with the identification of a strategic requirement which existing weapons are unable to meet. Options are then supposedly explored, among them new weapon concepts, in order to fulfill this requirement. This may lead to a weapon program, which, in turn, leads to the development, production, and procurement of a new weapon. (Farrell, 1997, p. 80)

The United States is in the midst of an emerging military revolution (Krepinevich, 1999). Presently, the United States military is experiencing a period of uncertainty about its purpose, defined as its "roles and missions." Ongoing discussions continue to address what should be the present and future roles and missions for the DoD. During the 2000 presidential election, candidates George W. Bush and Al Gore "hammered out their positions on issues including the divergent vision for the roles and missions for the military" (Government Executive, 2000, p. 14). General Hugh Shelton, past Chairman of the Joint Chiefs of Staff stated: "While the fundamental purpose of the armed forces is to fight and win the nation's wars, that isn't all." (Shelton, 2000).

DoD policy developers specifically address requirements for the U.S. military to maintain a focus on military action short of war, commonly called Military Operations Other Than War (MOOTW; Graham, 1993). Senator McCain (R-AZ) articulates the need for the military to be fully equipped with the necessary materials and supplies to achieve both historic and evolving roles and missions for the 21st century military (McCain, 1994).

While these discussions on changing roles and missions for the military forces are interesting, they do not necessarily address the central issue of this dissertation, which is decision making in defense acquisition. However, discussions on possible future roles and missions for the military are necessary because only after discussing why specific weapon systems are needed and procured, can an evaluation be achieved as to how the defense acquisition decision-making process works.

> An important consideration that must be addressed in how a weapon system is acquired is the extended period of time dedicated to the research, development, production, and then fielding of major weapon systems. To know why a specific weapon systems being procured takes so long in this decision is an important consideration because this time in weapon systems acquisition is usually in excess of ten years, and results in many opportunities for changes in security discussions that ultimately influence those decisions. (Adelman & Augustine, 1990, p. 224)

The Acquisition Decision-Making Process

> Procurements are for little things; acquisitions are for big things.
> (Sammet & Green, 1990, p. 1)

The questions to be asked of the defense acquisition decision-making process is whether it provides the military establishment with equipment required to achieve its

assigned missions and whether it does at an appropriate cost. This chapter examines the methodology used by the DoD to make the acquisition decisions.

An understanding of the defense acquisition decision-making process begins with definitions. For purposes of this dissertation, the definition of the defense acquisition process is "a single uniform system whereby all equipment, facilities, and services are planned, developed, acquired, maintained, and disposed of within the DoD" (Department of Defense Instruction, 1996, p. 1). Thus, the defense decision-making system includes those policies and practices that govern acquisition decisions, determining and prioritizing resource requirements, directing, controlling, and reporting these actions.

Three institutions usually constitute the defense acquisition community: the executive branch of the federal government, the legislative branch of the federal government, and the private sector. This community collectively recognizes that there exists a set of common interests in defense acquisition, but its members must also individually respond to the divergent agendas, motivations, and perspectives rooted in the organizations and stakeholders that they represent. The problems produced by this divergence of interests have plagued the defense acquisition process and adds to the perception that this decision process is inefficient and ineffective (Sammet & Green, 1990).

The defense acquisition system's primary objective is to acquire products which satisfy the needs of the military user in a timely manner and at a reasonable cost (Department of Defense Instruction, 1996). To accomplish this task, the DoD has structured an acquisition management system characterized by short, clearly defined lines of responsibility, authority, and accountability. Rigorous internal management control

systems are an integral part of the decision process and the current means to do this is a four-step defense acquisition decision methodology.

The Four-Step Defense Acquisition Decision Methodology

All acquisition decisions are based on mission needs that result from the ongoing assessment of current and projected war fighting capability (Department of Defense Instruction, 1996). The four steps are illustrated later in this section, but first there exists a specific pathway of several preliminary decisions that need to be made before the formal defense acquisition decision-making process is even initiated. First, a mission need must be identified then the DoD initially attempts to satisfy this new mission need through a nonmaterial solution. These proposed nonmaterial solutions are either a change to military strategy, doctrine, or organizational structure. If this change to strategy, doctrine, or organizational structure solves the new mission need then it is not necessary to even begin the defense acquisition decision-making process. However, if a nonmaterial solution is not possible then it is requires the procurement of a new weapon system. The next step is for the JCS to agree with the previously documented decision for this acquisition of a new weapon system. Once approved by the JCS--specifically by the Joint Requirements Oversight Committee (JROC)--this validated need for a new weapon system is then forwarded to the OSD staff for its approval (Sammet & Green, 1990). The OSD senior acquisition decision-making group that approves this validated need for a new weapon system is the Defense Acquisition Board (DAB). If the DAB approves the initiation of a major weapon system, then the formal four-step acquisition process may finally begin (Sammet & Green).

The acquisition decision-making process involves all tasks and activities required for a major weapon system to successfully complete its research, development, production, and fielding decision points. The defense acquisition decision-making process is divided into four steps and each step has a unique name. The names of these steps are "Concept Exploration," "Program Definition and Risk Reduction," "Engineering and Development," and "Production, Fielding, Deployment, and Operational Support." A diagram of the defense acquisition decision model illustrates the four-step process and the four decision points called "Milestones" and are numbered 1 through 4.

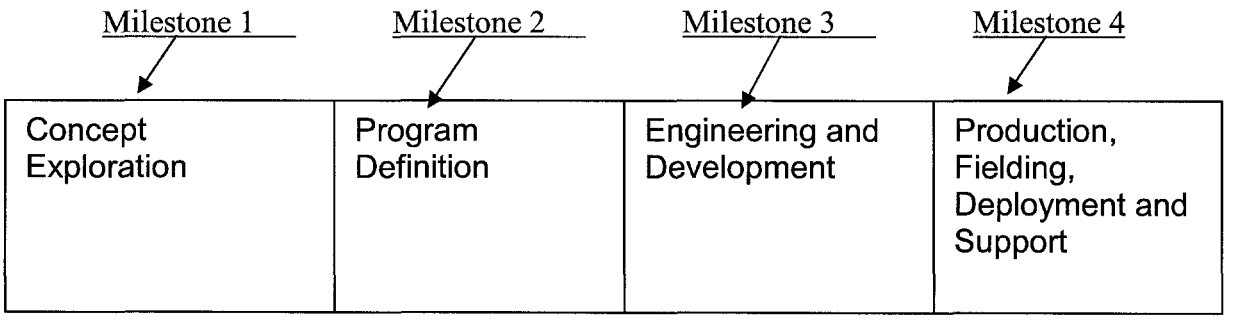

Figure 3. Diagram of the defense acquisition decision model.

Each of the four major steps in the acquisition decision model is initiated by a decision point. Each of these four decision points is called a "Milestone" (Department of Defense Instruction, 1996). These four milestones provide a systematic means to progressively translate the broadly stated "need" for the weapon system into a well-defined, system-specific requirement, and ultimately into an operationally effective military element of national security. In order to continue the program into each phase of

the decision-making process, a decision to proceed is made by the DAB. In making this decision, the DAB must consider the enemy threat, system performance and cost estimates, interoperability with other fielded weapon systems, and affordability constraints upon the entire DoD (Fox, 1972).

The DAB is the senior acquisition group for the DoD and its membership is comprised of the Under Secretary for Defense for Acquisition and the Vice-Chairman of the Joint Chiefs of Staff along with representatives of their staffs. Before a weapon system can apply for a DAB decision there are two preliminary decision subordinate groups of acquisition decision-makers the program must proceed through. The first of these two junior decision groups is called the Integrating Product Team (IPT). This group is co-chaired by the weapon system program manager and a representative from OSD. This group meets at least twice a year, or more frequently if technical, cost, sor chedule problems are identified (Department of Defense Instruction, 1996).

The second and more senior group of these two junior decision-making groups is called the Overarching Integrating Product Team (OIPT). This group only meets after the IPT has identified a specific issue for OIPT decision (Department of Defense Instruction, 1996). The membership of the OIPT includes military officers and civilian personnel of General Officer and Senior Executive Service rank who report directly to members of the DAB (Department of Defense Instruction, 1996).

While every acquisition program is unique, the following are the four decision points that every weapon system must pass before DAB approval is given. The first phase of these four step decisions is called *Concept Exploration.* This is typically where competitive, parallel short-term concept studies are conducted to evaluate whether there

is a material means to solve a JCS validated need or, in DoD jargon, a *requirement* (Department of Defense Instruction, 1996). The focus of this phase is to define and evaluate the feasibility of alternative concepts and to provide a basis for assessing the relative merits of these concepts at the next milestone decision point. The most promising of these concepts, as defined by members of the DAB, are established in terms of initial, broad objectives of cost, schedule, performance, software requirements, opportunities for tradeoffs, overall acquisition strategy, and testing strategy.

The second milestone step is called *Program Definition and Risk Reduction.* The purpose of this step is to determine whether the results of the first phase warrant the establishment of a new acquisition program and, if so, to establish a DoD commitment to fund the program from the DoD budget (Department of Defense Instruction, 1996). The military service that has been designated as the lead service to build the system provides a program manager and a program executive officer to manage the program. Additionally, that military service specified must also provide the funding so that the system can be built as previously defined in the *Concept Exploration* phase (Sammet & Green, 1990).

The third milestone decision step is called *Engineering and Manufacturing Development.* The decision to advance a program into this phase is very significant. *Engineering and Development* consumes enormous funding resources and a program is rarely cancelled or reversed once it enters this phase of the process (Key, Nyberg, & Smith, 1998). The purpose of this phase is to allow the industrial contractor to design, fabricate, and test a completed version of this weapon system. The primary objectives of this phase are to translate the most promising design approach into a stable, producible,

supportable and cost-effective weapon system, capable of being manufactured and operated as previously approved and designed (Department of Defense Instruction, 1996).

The final decision point is called *Production, Fielding, Deployment, and Operational Support* phase. During this phase of the process, it is the responsibility of the weapon system program manager to ensure that the system is produced at an economical rate and deployed in accordance with the needs of the DoD (Department of Defense Instruction, 1996). The operational support for a weapon system begins as the first system is fielded and continues until the system is fully retired from the DoD inventory.

The Role of the Office of Secretary of Defense in Acquisition Decision Making

The Secretary of Defense and his senior policy advisors who oversee the acquisition process are political appointees. These individuals often have limited expertise in managing large public sector organizations and usually remain in their positions for only a few years (Stillman, 1999). Many of these appointees are skilled individuals who come to government work after having spent many successful years in the private business or the academic sector of American society. Other individuals sometimes follow a "revolving door" career path whereby they work in the public sector for a period of time, then work in private business for a period of time, and then return to the government sector (Fox & Field, 1988). The election of a new political party to the executive level of government has a significant impetus to the occurrence of this revolving door occurrence; many political appointees must be replaced by individuals affiliated with the political beliefs of the new administration (Denhardt & Hammond, 1992).

The Secretary of Defense has limited control of the defense acquisition decision-making process because of a long-standing organizational culture entrenched at DoD (Fox & Field, 1988). This scenario allows the military departments to have a very strong institutional voice in the formulation of policies and considerable independence in the implementation of decisions that are made at the DoD (Fox & Field). Thus, this management culture forces the Secretary of Defense to rely more on his or her own senior staff members, who are also political appointees, during the initial phases of the acquisition decision-making process to gather necessary information for the SECDEF to make prudent decisions. During this period of the process, the services, especially, become focused on their unique military requirements and can "prostitute" the decision-making process to ensure their own service needs are met. This manipulation of the decision process by a military service could be caused by the zealous overstating of a proposed weapon system technical performance capability or underestimating the possible total costs to research, develop, produce, and field this system (Sammet & Green, 1990).

The total OSD staff is comprised of political appointees, uniformed military officers, and career civilian civil servants. The majority of the OSD staff is made up of the career civilian civil servants that have been working acquisition issues for many years. As a result of this longevity, many of these professional civilian staff members have participated previously in numerous acquisition decisions and are able to maintain long-term historical perspective for the DoD. The foundation for the current acquisition decision-making methodology was formed at the beginning of the Cold War with the establishment of the Planning, Programming, and Budgeting System.

Cold War Strain on the Acquisition Decision-Making Process

A major political issue throughout the 1950s was the controversy surrounding the planning and budgeting for defense (General Accounting Office [GAO], 1983). This planning and budgeting system was to develop a cold-war capability that would provide for the necessary defense against mainly Soviet Union perceived threats throughout this period. Additionally, this planning and budgeting system was to avoid a high level of defense expenditures that would create an economic disaster faced earlier in both the Truman and Eisenhower administrations (McNaugher, 1989). Aggravating the problem of DoD weapon acquisition was the struggle among the three military services. The three military services were simultaneously attempting to protect their traditional roles and missions and perhaps increase their responsibilities in light of evolving technology, which was radically changing both weapon delivery systems (planes, ships, and tanks) and the weapon's payload (nuclear and conventional high explosive) of new systems (Gansler, 1989).

Both the Truman and the Eisenhower administrations adopted a budget-ceiling approach--that is, a fixed dollar amount within which each of the services had to confine its annual budget request (Wildavsky, 1992). However, this intra-service competition for those finite dollars intensified inter-service rivalry to convince the administration, the Congress, and the American public that a particular weapon system was necessary for national security, in order to increase that service's share of the total defense budget (White, 1980).

The dilemma, as then perceived, of maintaining a cold-war military establishment in a democratic political system and free enterprise economic system was summarized in his diary by the first Secretary of Defense, James Forestall:

> There are no easy black and white solutions for the problems which face this country. How to secure the formation of capital necessary to our plant replenishment, how to secure a tax system which will provide the incentive and the opportunity for the individual acquisition of capital, how to balance between a military organization sufficiently formidable to give any other country reason to stop, look and listen without the same time eating our national heads off – these are segments of a very complex matter which must trouble any citizen who understands it. (Millis & Duffield, 1951, p. 5)

After the Russians launched Sputnik I in October 1957, there was a growing expression of public concern that the Eisenhower administration's economic philosophy was keeping the defense acquisition decision-making process below the point necessary to maintain national security (Kapstein, 1993). In 1958, the Committee for Economic Development issued a policy statement on the "Problems of National Security." This report noted that the post-Korean conflict defense expenditures had been "largely motivated by a profound concern over the state of the national economy, the need to balance the federal budget, and the desirability of lighting the tax burden on business and individuals" (Committee for Economic Development, 1958, p. 18). The statement concluded that defense spending up to 15% of the Gross National Product for defense would not ruin the American way of life (Committee for Economic Development, 1958).

The ceiling approach to defense budgeting could be criticized for providing an artificial and seemingly arbitrary limit on the size of the overall military budget, but the ceiling did provide an absolute answer to the question "how much money is to be spent on defense?" Defense decision makers did argue that the sizing of the nation's defense

establishment should be determined by enemy capabilities and intentions; while they acknowledge that assessing those capabilities is fraught with all the uncertainties surrounding intelligence-gathering activities, identifying and forecasting enemy intentions is an arbitrary and very subjective process (Gansler, 1989). Moreover, during this period, military acquisition was undergoing a rapid increase in the use of high technology, for example solid-fueled missiles were being developed and deployed (Defense System Management College [DSMC], 1983). There was a great demand for fiscal resources within the DoD for research, development and weapon system production. Thus, the critics of the ceiling approach were faced with the dilemma posed by Forestall of a means for placing limits upon the defense expenditures other than arbitrary ceiling calculated in terms of what the economy could afford. The approach that was selected was to make the defense acquisition decision-making process very convoluted so that only the very best systems could successfully endure this long and difficult trek to actual weapon system production phase of the management (Fox & Field, 1988).

During his presidential campaign in 1960, John F. Kennedy criticized the defense policy of the Eisenhower administration and charged that a "missile gap" had resulted from this slowing down of the pace of the defense acquisition decision-making process (Adelman & Augustine, 1990). Specifically, Kennedy proclaimed that the United States would change this decision-making process when he told the world that the U. S. would "pay any price, bear any burden, meet any hardship, support any friend, oppose any foe to assure the survival and success of liberty" (Adelman & Augustine, p. 12).

One of Kennedy's first acts was to endorse a new defense acquisition policy, which was enunciated by his Secretary of Defense Robert McNamara. McNamara

announced that he had been instructed by the new president to disregard arbitrary budget ceilings in constructing his defense program. The major substantive policy change was to strengthen the decision-making process by allowing those involved in this process to buy non-nuclear capable forces. These non-nuclear weapon systems were relatively cheap and the President could very quickly show a large increase in the force structure of the United States military without a large investment and could be procured in a relatively short length of time. Additionally, these non-nuclear forces were heralded as a means to avoid extreme situations in which we might be forced to use nuclear weapons because we lacked other options (GAO, 1983). At the same time, McNamara detailed a new process by which defense acquisition decisions would be reached. He reiterated his belief that the economy could maintain large defense expenditures over a protracted time, but he rejected the notion that the nation's economy was dependent upon defense spending (Wildavsky, 1984). His proposed decision-making system would extend further into the future in order to provide lead-time sufficient to permit adjustments to the consequences of decisions. McNamara stated,

> Our choice of weapons must reflect the most imaginative exploration of choices available, our budgeting procedures must be revised to show all the costs of alternative weapon systems, not only for the research and development, and for the initial construction, but for the operations and maintenance as well. (Speech McNamara delivered at Waldorf Astoria, New York, April 24, 1961)

A few months later, Charles Hitch, the Rand economist who had become McNamara's controller at the Department of Defense, characterized the new decision-making process as a "program package budgeting approach" (Hitch, 1965, p. 8). Hitch told Congress that his remarks described "what we were doing to improve the planning-programming-budgeting process within the DoD" (p. 8).

The History of the Planning, Programming and Budgeting System

The Secretary of Defense, in the period since 1961, has gained a large measure of control over resource allocation policies within the Department of Defense by centralizing the decision-making procedures. The centerpiece for this decision-making process has been the planning, programming, and budgeting system (PPBS). PPBS was formulated largely by Charles J. Hitch, the Assistant Secretary of Defense (Comptroller), and was adopted by McNamara as the essential framework for a single cohesive acquisition decision making management system (Enthoven & Smith, 1971). The original intention of the PPBS was to impose "a centralized decision making framework on the defense acquisition decision-making process" (Enthoven & Smith, pp. 33-34), stated Mr. Alain Enthoven and Mr. Wayne Smith, who held key positions on the comptroller staff during McNamara's tenure.

> The fundamental idea behind PPBS was acquisition decision making based on explicit criteria of the national interest in defense programs, as opposed to decision making by compromise among various institutional, parochial or other vested interests in the Defense Department. . . . In developing the defense program, it is the Secretary of Defense who is charged with ensuring that the interests of the nation take precedence over the special institutional contractors, the scientists, the localities, and other such groups that make up or depend on the Defense Department. . . . A centralized decision making authority is needed at the top to attain and exercise the overall perspective necessary to integrate the contributing parts into an inherent whole. Finally, decentralized decision making in strategy and acquisition planning simply has not worked. (Enthoven & Smith, pp. 33-34)

The PPBS is a cyclical process containing five distinct but interrelated phases of planning, programming, budgeting, executing, and accountability (Lynch, 1995). The first three phases entail the reexamination and analysis of prior decisions from the viewpoint of military force structure and the current environment of national security to include the

military threat to the country, economic constraints, and technological factors and the funding resources that are being made available. Current planning, programming, and budgeting approaches are either reaffirmed or modified as necessary in execution and accountability (White, 1967).

Along with the PPBS, first implemented in 1961, McNamara introduced another analysis tool called *systems analysis. Systems analysis* uses techniques similar to those used by academic operations research in making decisions. Specifically, this approach used the "quantification of factors" as a means of primary analysis. The analysts quantified the merits of a program to produce a set of mathematical factors. These factors would then be compared to other alternatives and thus the ultimate decision could be based on an expected value of the decision (McNaugher, 1989).

The McNamara DoD management team won respect in the beginning of their tenure because of the particular combination of boldness and rationality, which had accompanied their decision making (White, 1980). Key features of the McNamara years were the SECDEF's insistence on a scientific type approach to decision making or the "show me" attitude, and the strong influence of the so-called "whiz-kids" (Enthoven &Smith, 1971). These "whiz kids," who were considered the department's "intellectuals," were mostly young civilians with little or no military experience. They used the scientific techniques of systems analysis, cost-effectiveness studies and other analytical techniques for decision making (Gansler, 1989).

Subsequent Secretaries of Defense have made modifications to the PPBS system established by McNamara, but the major framework of this process continues to this day. One major modification made by the Nixon administration in 1969 revised the

management procedures to link the formation of military strategy and the budgeting process more closely (Thibault, 1984). Specifically, Laird tied together these processes to ensure a more intimate participation of each military service during the acquisition decision-making process and to broaden the participation by the services in the total process (Fox & Field, 1988). Additionally, Laird successfully increased the delegation of authority for acquisition decisions for the first time. He delegated the acquisition decisions down the "chain of command." The primary responsibility of the military departments for executing these programs was emphasized and the authority of the individual program mangers was strengthened (White, 1980).

These program manager decision makers are affected by influences both internal and external to this public institution. The external influences that influence defense decision making are outside of their control and always changing. Examples of influences from external sources include the amount of program funding received via the federal budget and specifically from their military service segment, wishes of Congress for program direction, changes in the military missions, and advancements made by industry in technology which could be incorporated into future weapon systems.

Herbert Kelman, of Harvard University's Kennedy School of Government and the former Director of Federal Procurement Policy at Office of Personnel Management, stated that the impact of these external influences on specific programs can adversely impact the success of defense acquisition management. Kelman (1990) states, "Individuals should be given greater discretion in making decisions than just following rules" (p. 27). Henry Mintzberg (1979), another scholar of decision making in government agrees with Kelman. Mintzberg states, "A mediocre level of organizational

performance results when people mechanically apply rules to situations that call for more than the mindless mechanical behavior and when rule-boundedness stifles creativity and the striving for excellence in decision making" (p. 105).

The combination of rules and discretion, however, varies among organizations. Fred Thompson writes that the DoD buys more equipment than the rest of the Federal Government combined (Thompson, 1992). More than 20,000 firms have contracts with the DoD. More than 15,000 of these firms are considered "prime contractors"--that is, large firms that have the significant responsibility to accomplish the project and therefore assist in making some of the major decisions in the defense acquisition process (Sammet & Green, 1990). These firms employ hundreds of thousands of employees who perform roles as engineers, accountants, security, business managers, lawyers, and lobbyists. The annual budget for the 2001 defense department was $277 billion (Defense Authorization Act, 1999). Given that the average estimated half-life of DoD equipment is 10 years and the acquisition decision-making process for major weapon systems takes more than 10 years (Air Force Acquisition Fact Book, 1998), then the DoD is always engaged in the acquisition decision making of major weapon systems.

Exactly how does the Defense Department actually make these decisions? Is there an approved format for making acquisition decisions? Do all acquisition decisions take this same format? The following section describes the categories and structure in which defense acquisition decisions are made.

Program Acquisition Categories

> Acquisition programs are divided into categories, which are established to facilitate decentralized decision making and execution and compliance with statutory requirements. (Department of Defense Instruction, 1996, p. 2)

The approved format for making acquisition decisions is based on two criteria. The first is the cost of the program, either the annual dollar amount or total program dollar cost. The second criterion for selecting an acquisition program into a specific program acquisition category is left to the discretion of the senior decision maker to place the designated program into a specific decision-making format. This criterion is usually done when Congress identifies the program as an item of political concern (Department of Defense Instruction, 1996).

The following information is excerpted from DoD regulation 5000-2R (Department of Defense Instruction, 1991), which is the governing document through which all defense acquisition decisions are derived, and from the 1998 Air Force Acquisition Fact Book (1998, pp. 34-35). Upon initiation, size and complexity shall generally categorize acquisition programs. The acquisition categories (ACAT) are

1. ACAT 1 – Major Defense Acquisition Programs
2. ACAT 1A – Major Automated Information Systems
3. ACAT II - Major systems
4. ACAT III - All other acquisition programs

ACAT I programs are Major Defense Acquisition Programs (MDAPs). An MDAP is defined as a program estimated by the Under Secretary of Defense (Acquisition and Technology; USDA (A&T)) that requires expenditure for research and development, test, and evaluation of more than $355 million (in FY 1996 constant dollars) or procurement

costs of more than $2.135 billion (FY 1996 constant dollars) or those specifically designated by the USD (A&T) to be ACAT I. ACAT I programs have two sub-categories:

1. ACAT ID, for which the MDA is USDA (A&T). The "D" in ACAT 1D refers to the Defense Acquisition Board (DAB), which advises the USDA (A&T) at major decision points. This DAB process is the most time consuming and paperwork intensive. This is the process reserved for the most expensive defense acquisition programs. While few in number (roughly 15 programs in any year), they are the programs that receive the vast majority of media and Congressional attention.

2. ACAT IC, for which the MDA is the DoD Component Head or, if delegated, the DoD Component Acquisition Executive (CAE). The "C" refers to Component. The USDA (A&T) designates programs as ACAT ID or ACAT IC. This is a measure that reflects the fiscal size of the acquisition of a weapon system. "C" programs are not as expensive as "D" programs.

ACAT IA programs are Major Automated Information Systems (MAIS). An MAIS is estimated by the Assistant Secretary of Defense for Command, Control, Communication, and Intelligence to cost for any single year in excess of $30 million (FY 1996 constant dollars), total program cost in excess of $120 Million (FY 1996 constant dollars) or total life-cycle costs in excess of $3 Billion (FY 1996 constant dollars), or those designated by the ASD (C3I) to be ACAT IA. ACAT IA programs have two sub-categories:

1. ACAT IAM, for which the MDA is the Office of the Secretary of Defense (OSD) Chief Information Officer (CIO). The "M" refers to major Automated Information System Review Council (MAISRC).

2. ACAT IAC, for which the MDA is the Department of defense (DoD) Component Chief Information Officer (CIO). The "C" refers to Component.

The key to this category of defense acquisition program is that it mainly falls into the area of "information technology." The DoD has now instituted this acquisition category so that the Chief Information Office for the DoD is the senior decision maker for all of these "information technology" programs. The reason for this specific responsibility is based on the premise that "information technology" weapon systems are considered different than other weapon systems in the DoD and thus, require them to be acquired through a specialized, albeit streamlined, decision-making methodology.

ACAT II programs are defined as those acquisition programs that do not meet the criteria for a major system as illustrated above. A major system is defined as a program estimated by the DoD component head for research, development, test, and evaluation of more than $140 in FY 1996 constant dollars, or for procurement of more $645 million in FY 1996 constant dollars, or those designated by the DoD Component Head to be ACAT II. ACAT III programs are defined as those acquisition programs that do not meet the criteria for an ACAT an ACAT IA, an ACAT II, or ACAT I.

What Are the Issues With DoD Acquisition Reform?

While streamlining the acquisition process has been a constant activity within the DoD, it has received renewed interest with the Congressionally mandated personnel manning downsizing reductions to DoD and the completion of former Vice President Gore's National Performance Review. Both of these initiatives demanded that DoD officials seek more effective and efficient ways to conduct business. These past efforts to

overhaul the military acquisition process attempted to take account of difference between the government and business approach (Kapstein, 1993).

OSD policies on reforming the acquisition decision-making system included several key tenets. First, the DoD should, if possible, move away from demanding that industry build weapon systems to unique government specifications, called military specifications (MILSPECS) and adjust their expectations to incorporate commonly accepted commercial business practices. Second, the government should see their relationship with the commercial business community not as an adversary but rather as a partner. And third, weapon system cost should be treated as an independent variable (Air Force Acquisition Fact Book, 1998).

According to Fred Thompson (1992) of Willamette University, "The basic problem with the DoD's acquisition system is that it is riddled with fraud and waste." (p. 372). These perceived evils range from over-charging for materials and services, payroll padding, including the misappropriation of government property and bribery, to kickbacks and conflicts of interests. Thompson also stated that corruption and favoritism are the root cause of most of the failings of the DoD acquisition process. While Thompson does not state that the structure of the acquisition decision-making process is inept, he does, however, state, that the abuses of the decision-making process make it ineffective. He is not alone in such an assessment of the acquisition decision-making process.

Congress has added an assortment of new laws aimed at further disciplining the DoD acquisition community, specifically in the area of combating perceived waste and fraud. The result of these Congressional actions is that the DoD is developing an

acquisition reform policy to address these concerns of perceived mismanagement and its resulting perceived faulty decision-making process. In concert with these acquisition reform efforts, the DoD has formed a series of "Blue Ribbon" Committees to re-examine the DoD acquisition process (Gansler, 1989).

Change is taking place. Dr. William Perry, former SECDEF, writes, "I laid out the entire program of (acquisition) reform in a major statement of acquisition policy entitled Acquisition Reform: A Mandate for Change in February 1994." Congress, enthusiastic about reform, promptly passed a landmark legislation called the Clinger-Cohen Bill. "This laws gave the Department of Defense the legal authority to unshackle the acquisition system" (Carter & Perry, 1999, p. 185).

Why Is the Defense Acquisition Decision-Making Process Structured As It Is?

> The acquisition of defense systems has never been characterized by high efficiency or particularly good management. (Weimer, 1975, p. 24)

Planning, organizing, staffing, and organizational development are the key functions of top management in any organization, public or private. However, the DoD acquisition community is faced with much more public attention to its decision-making process than private sector companies because of the importance of their work to the security of the nation and the large amount of public funding that this department has authority to obligate. As Samuel P. Huntington (1961) stated in *The Common Defense*,

> Criticism has been directed at many aspects of the defense departments, including the for instance, the procedure for weapon system procurement. Varied as the criticisms have been, however, they have focused on the strategic side of the defense establishment... These criticisms tend to articulate in a variety of ways a single underlying theme: that there is a gap between defense organization and strategic purpose. (p. 143)

Peter Drucker (1968) offers two basic rules governing organizational design. First, strategy should determine structure. Strategy means the pattern of purposes that defines the organization and its mission. The second basic rule is that the organization implementation of that strategy should be as decentralized as possible. Decentralization requires prior clarification of purposes or functions of each administrative unit and responsibility center, procedures for setting objectives and for monitoring and rewarding performance, and a control structure that links each responsibility center to the goals of the overall organization structure.

The Defense Department faces unprecedented challenges in preserving effectiveness in its acquisition process due to the radically changed military threat, declining defense budgets, and rapidly changing technology base. On March 15, 1994, as Secretary of Defense Perry told the military services, the Chairman of the Joint Chiefs of Staff, and the heads of all defense agencies,

> The existing acquisition decision-making process will not be capable of responding to all customer needs in this new environment. The world in which the DoD operates has changed beyond the limits of the existing acquisition system's ability to adjust or evolve and it must be totally reengineered. (Perry, 1994, n.p.)

The Role of the SECDEF and Military Departments in Defense Acquisition Decision-Making Process

The post Cold War era poses a new set of political, economic, and military security challenges for the U.S (McNaugher, 1989). These challenges are reflected in regional or limited conflicts amongst political entities; proliferation of weapons of mass destruction, both nuclear and non-nuclear; risk to economic well being; and the possible failure of democratic reform taking place in the former Soviet Union (Cohen, 1997a).

The Secretary of Defense is committed to pursuing national security policies designed to not merely to react to the changing environment, but also to shape that environment in ways that are favorable to US interests (Cohen1997a). Through this process it is believed that the U.S. will be able to maintain the current advantage that now allows this country to deter aggression and to prevail quickly with minimum casualities when required to employ our military forces (Brown, 1983).

Despite the considerable centralization of controls and the expanded role of the Office of the Secretary of Defense for almost 4 decades, the management responsibilities of the military departments continue to be extensive and to involve large sums of money. The FY 2000 federal budget appropriated and authorized for DoD Research, Development, and Procurement of military weapon systems is $91.6 billion (Year in Defense 2000). This marks the first increase in federal funding since the Reagan administration. According to Congressman Jerry Lewis, Chairman of the House Appropriations Committee, Defense Subcommittee; "The FY 2000 Defense Appropriations Bill includes the first significant defense appropriation increase in 14 years" (Year in Defense, 2000, p. 25).

The military departments perform management functions, to include their own decision-making process concerning the organizing, training, and maintaining of personnel assigned to both Active and Reserve military forces (Bennett, 1974). In particular, each service has its own acquisition community and a defined decision-making process that fits with and compliments the decision-making process of the DoD (Sammet & Green, 1990).

Since 1947, when the "National Security Establishment," the forerunner of the DoD was created, the military departments have made various organizational adjustments to conform to overall realignment directed by the OSD. The services have initiated changes to improve efficiency in the management of resources and specifically addressed their own acquisition decision-making processes (Bennett, 1974). The pattern of organizational development has been different for each of the military departments. The Army and Navy, being large and established institutions, slowly modernized management practices through the 1950s, altering some established procedures (McNaugher, 1989). The newly formed Air Force set its own course and viewed each decision as an opportunity to build new traditions vice protect century old traditions as did the Army and Navy (White, 1980).

Upon becoming Secretary of Defense in 1961, McNamara placed emphasis on the approach to decision making. He instituted PPBS and encouraged efforts to bring the various military departments' corporate structure into congruence with his concept of centralized management by giving more oversight of the military departments to OSD; however, the moves toward efficient decision making by the military departments advanced more quickly then McNamara had envisioned (Kapstein, 1993).

The Air Force was management-oriented from the start and had fewer reservations about making changes than did the Army and Navy (White, 1980). This may be accounted for in that the Air Force was the newest service, having been formed in 1947, a mere 14 years before McNamara came into power and had the least formed infrastructure and history of tradition to protect. The Army adopted a far-reaching reorganization plan in 1962 but faced management problems, particularly in the acquisition areas

(McNaugher, 1989). In 1963 and 1964, the need for streamlining headquarters while improving management prompted major organizational changes affecting many Army units. The Navy adapted gradually to the management changes initiated by McNamara, and it was not until 1966 that it restructured and realigned its functions (Brown, 1983).

While each of the military departments is assigned specific functions through the National Security Act of 1947 in support of the overall missions of the DoD, the Congress refrained from delineating the roles and missions of each of the military departments (White, 1980). At the direction of President Truman, in 1948 the Service Chiefs worked out the Key West Agreements dividing these responsibilities among the Services (Wolk, 1997).

At the request of Secretary of Defense James V. Forestall, Congress, in 1949, amended the National Security Act of 1947 to increase the authority of the Secretary of Defense over the departments, and specifically increasing responsibility in the area of defense acquisition (White, 1980). The three services' military departments, although continuing to be administered separately, were made subordinate to the Office of the Secretary of Defense, and were deprived of their previous status as executive departments. To improve the defense acquisition decision-making process and align its functions, the Office of the Comptroller and Deputy Comptroller were established in the DoD. The amendments also provided for a chairman of the Joint Chiefs of Staff and DoD civilian responsibility for the acquisition decision process (White).

Reorganization Plan Number 6, approved by the Congress to take effect on June 30, 1953, was spurred by a renewal of the inter-Service rivalries over the roles, missions, and resource allocation after the Korean War (Farrell, 1997). These influenced the

decision-making process of the DoD, in that the changing world environment started to focus on the possible use of nuclear weapons (Brown, 1983). This implied that the first concern for the United States security was for a deterrent nuclear force with its implied bomber and strategic missile programs as the near-term recipient of increased DoD funding. The Navy, at this time, began an earnest examination of a submarine launched intercontinental ballistic missile capability (DSMC, 1983). This was an attempt to preserve some Navy acquisition budget that was exposed to the Air Force's increase in funding for the acquisition of the rapidly developing Cold War strategic bomber fleet (Brown, 1983).

The Department of Defense Reorganization Act of 1958 removed the military departments from the operational chain of command in which they had been placed in 1953. All operational forces were assigned to the Unified and Specified Commands and were directly responsible to the Secretary of Defense and the Joint Chiefs of Staff (Cole, 1979). Under this new arrangement, the operational chain of command runs from the President, through the Secretary of Defense via the Joint Chiefs of Staff, to the commanders of the Unified and Specified Commands. The military service maintained their role to train, organize, and equip their forces.

This management role for the military departments in acquisition was important because weapon systems procurement was extremely expensive and employed many workers. Additionally, the DoD acquisition community decision-making process for these weapon decisions became more centralized to the OSD. The individual military services still maintained large acquisition staffs; however, the acquisition decisions came from a smaller number of OSD individuals (Carter & Perry, 1999).

The actions to centralize the acquisition process of the defense systems posed several questions over the jurisdictional boundaries between the OSD and the military departments (Sammet & Green, 1990). Solutions to this centralization issue were that common use by all services items were bought by the DoD, while the service continued to procure the service unique weapon systems. However, as the total price of these service-unique items increased, there was an expanding role of the OSD in acquiring these systems too (Carter & Perry, 1999).

The military departments lost much of their earlier autonomy; however, the military departments serve a very useful purpose by providing a system of checks and balances in the determination of military acquisition. Even though the services gained some power in the 1970s and 1980s, they continue to lose decision-making power today (White, 1980).

The Role of Service Department Secretaries in Decision Making

As the top executive of his or her department, the military department secretary has the overall responsibility for management and decision making. Although the overall budget decisions are made by the Secretary of Defense, the President, and the Congress, the individual military department secretaries perform an active and critically important role in the acquisition decision-making process (Gansler, 1989). As spokesman for his or her department, the secretary can influence the formulation of acquisition plans and policies. However, the planning and management guidance from the Secretary of Defense frequently tends to set the long-term military plans and programs framework for the entire

DoD (Gansler). Hence, the military service secretaries usually are placed in the role of implementers and not policy formulators (Kapstein, 1993).

To carry out his or her role effectively, the service secretary must have the confidence of the secretary of defense, the service chief of staff, and the members of the department. He or she must be regarded by the department as its advocate for basic programs, and its defender in the Pentagon. The service secretary is also the individual who chooses the Service Acquisition Executive (SAE; Sammet & Green, 1990). The SAE is the main decision maker for all acquisitions within that military service; however, the service secretary has the final approval authority for every acquisition for that military service (Sammet & Green).

While the Congress generally has backed various centralization measures assisting the secretary of defense in directing the decision-making activities in an efficient and effective manner, it has, on the other hand, also supported each of the military departments in retaining control over their traditional missions. The actions by Secretary Brown during the second half of the 1970s, to increase his control over the defense acquisition decision-making process at the expense of the service secretaries, were looked upon unfavorably by the Congress. Thus Brown faced congressional opposition to abolish the relative importance of service secretaries' decision making, and his reign as defense secretary was viewed to be less dominant than that of McNamara (White, 1980).

Changes in the Defense Acquisition Decision-Making Process

The organization and management of the nation's defense activities have experienced far-reaching changes during the past 5 decades. Rapid advances in weapon

technology have brought revolutionary improvements in the range, accuracy, and destructive power of weapons and an increase in communications capabilities (Kapstein, 1993).

Although the need for improved integration and coordination in the management of defense resources became evident during World War II, the extent to which centralized decision making should be imposed on the defense acquisition structure has continued to be a subject of controversy to the present (Wildavsky, 1984). Progress in overcoming traditional military department resistance to centralized civilian control was particularly slow from the passage of the National Security Act of 1947 through the 1950s (McNaugher, 1989). The years after 1961 witnessed strengthening centralized controls, the introduction of improved management decision-making processes, and consolidation of functions common to two or more of the military services (White, 1980).

Most of the changes in the defense organization and management process since 1991 were carried out within the framework established by the Reorganization Act of 1958. The most sweeping reorganization and managerial innovation occurred during the period when McNamara served as the secretary of defense (White, 1980). Since that time, changes could be characterized as evolutionary, until the Goldwater Nichols Reorganizations Act was enacted in 1986 (Carter & Perry, 1999). Taking advantage of the increased authority accorded him by the Reorganization Act of 1958, Secretary McNamara strengthened civilian control over the military.

The establishment of a comprehensive management and decision-making system and the application of the principles of scientific management were among the most far-reaching developments of the McNamara years at the Pentagon (Gansler, 1989). This new

approach took a holistic view of the nation's military power and defense posture. The objective was to design forces and capabilities that met potential enemy threats. Previously, the allocation of defense resources had been strongly influenced by the persuasive arguments of each military department for its particular needs (Enthoven & Smith, 1971). Hence, the ability of each service to achieve its acquisition goal was a function of its senior leadership to successfully influence the senior DoD decision makers for increased funding (Fox, 1972).

As noted, McNamara submitted a new 5-year defense PPBS designed to make efficient and economical use of defense resources. Systems analysis was widely used as one of the tools in the McNamara style of decision making. A special effort was made to eliminate unnecessary duplication of acquiring similar weapon systems for each of the military services. Responsibility for functions common to all services were centralized and consolidated into a single defense entity (Kapstein, 1993). For example, the Defense Supply Agency now called the Defense Logistics Agency, assumed responsibility for common military supply needs (White, 1980).

The Nixon administration made a comprehensive study of the DoD organization, specifically focusing on its acquisition decision-making process. This study, called the Blue Ribbon Defense Panel, published its report in July 1970. In the Panel's view, the Office of the Secretary of Defense should be organized along functional lines leading to three major groups: (a) military operations, (b) management of personnel and acquisition of weapon systems, and (c) evaluation and testing of those weapon systems. This Blue Ribbon Panel also designated that a Deputy Assistant Secretary of Defense would head each of these major groups. The major recommendations affecting the role of the Joint

Chiefs of Staff and the Office of the Secretary of Defense reflected a move to give the Secretary of Defense more responsibility in the acquisition decision-making process (Farrell, 1997).

During the Carter administration, defense management studies were carried out as a part of the president's larger government reorganization project. In September 1977, the chief executive directed Secretary of Defense Brown to "initiate a searching organizational review . . . to produce an unconstrained examination of alternative management and decision process within the DoD" (White, 1980).

By February 1979, another congressionally mandated study initiated to investigate acquisition reform issues was initiated--the investigating panels were headed by Richard C. Steadman, Paul R. Ignatius, and Donald P. Rice. The Richard Steadman panel focused on the national military command structure. It outlined various measures to improve the role of the Joint Chiefs of Staff as an advisory group to the president and to increase the responsibility of the chairman of the JCS in providing advice on the acquisition of weapons systems programs. The second panel, headed by Paul R. Ignatius, made some 13 recommendations, several of which concerned strengthening the role of the service secretaries and adjusting organizational roles of the military department staffs.

The third panel headed by Donald P. Rice made a number of recommendations concerning the defense acquisition process; the essence of which is now included in the planning, programming, and budgeting system's decision-making process. This panel recommended the following courses of actions:

> -Combine the traditionally sequential program and budget reviews into a single annual decision-making process.

> -Utilize the time in the annual decision cycle freed by this combining of the program and budget reviews to focus additional attention on strategic and resource planning
> -Establish a Defense Resource Board, chaired by the Deputy Secretary of Defense to manage the program and budget decision-making process
> -Integrate the internal PPBS and the presidential resource allocation process, thereby enhancing the DoD capability to support presidential decision-making.
> -Relate the program and budget process and the acquisition decision-making process somewhat more closely. (White, 1980, p. 67)

As William Burdeshaw (1997), President of Burdeshaw Associates Ltd., wrote in the December 8-14, 1997 edition of *Defense News,*

> With military positions being cut, there will be more outsourcing of tasks to the civilian workforce. If congressional staffs are not reduced a similar amount, then the demands on the DoD acquisition community staff and service staff will remain level. If you reduce the DoD staffs, which need to be reduced, and they still have the same workload to respond to congressional oversight and staff inquires, then the time to do other things will become less and less. (p. 37)

With these evolving changes to the structure of the defense acquisition community, it is important to note that it is the decision-making process that may have to change if the entire DoD acquisition process is to remain effective. Fox and Field (1988) point out in their book, *The Defense Management Challenge: Weapons Acquisition*, that not only do the decision makers in these groups frequently change leadership, but also the circumstances on which acquisition decisions are based also change. Consequently, an individual acquisition program is usually subjected to frequent changes in funding, schedule, and technical performance requirements.

The Impact of Changes to the Defense Acquisition Decision-Making Process

Defense acquisition decision making includes the process whereby the DoD avails itself of the technological innovations developed by in the industrial base--a process that

consumes a significant share of discretionary federal spending. Various proposals have been considered that could streamline the acquisition decision-making process (Carter & Perry, 1999). Like Sisyphus, the DoD has tried to reform the acquisition decision-making process only to have the stone roll back upon itself (Brandt & A'Hearn, 1997).

Conventional wisdom depicts the defense acquisition decision-making process as comprised of three systems: the weapon system requirement process, PPBS, and the acquisition management system (Key et al., 1998). These systems are often portrayed as intersecting like three interlocked circles in a Venn diagram (Air War College, 1997, p. 85). An illustration of this Venn diagram appears as follows:

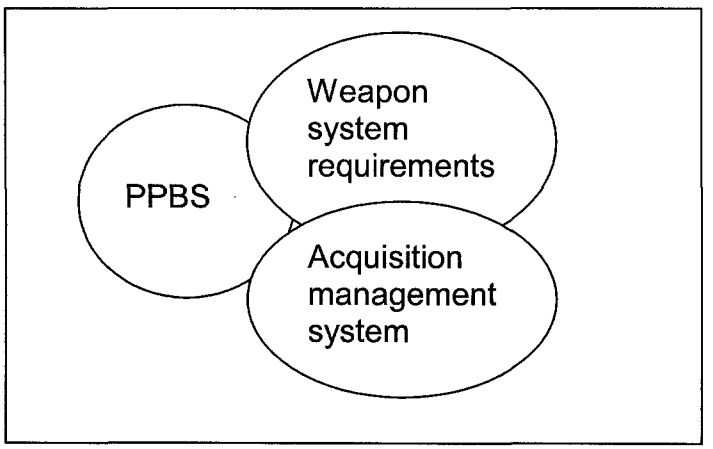

Figure 4. Venn diagram of defense acquisition decision-making process.

It may not, however, be as calm a decision process as this concept of intersecting circles may suggest. The defense acquisition decision-making process is an active environment, best described by Brandt and A'Hearn (1997): "Perhaps it can be argued that these decision-making processes do not intersect but that they collide" (p. 20).

These three elements of the defense acquisition decision system collide because wholly different and potentially incompatible forces and decision processes drive them. The requirement process involves a threat and technological opportunity. The PPBS is based on both a time and funding concept--the federal budget calendar review cycle and the resource allocation timetable (GAO Report, GAO/NSIAD-90-30, 1989). The acquisition management system is based on a milestone (or event driven) decision-making process and decisions are subject to progress during program development (Fox, 1972). The paradox is that these otherwise incompatible systems must work together.

Yet another paradox associated with the acquisition system involves organizational structure and its management practices. Specifically, the system reveals a sort of organizational schizophrenia. The defense establishment, like nearly all elements of the federal government, is structured as a large functional bureaucracy based on familiar models that grew out of the industrial revolution. By the 1960s, however, government and private industry began to discover the virtues of program management as a structure and a new approach for effective decision making. An unwillingness to disband functional organizations, however, kept the existing decision making and management structures in place. Thus, in the 1970s and the 1980s, one could find both functional and program decision-making processes were preserved simultaneously (Brandt & A'Hearn, 1997).

There are indeed pressing imperatives for changing the existing acquisition decision-making process. New technologies are being developed for the commercial marketplace using increasingly short development times to quickly incorporate new advances in products introduced into the marketplace (Augustine, 1983). Meanwhile, the

defense acquisition decision-making system with its complexity and long cycle time hinders exploitation of this huge global source of new commercially developed technologies (Kapstein, 1993).

In the final analysis, it is useful to recall that, as stewards of the public trust, the defense acquisition community has an obligation to find innovative, effective, and more efficient ways to enable this decision-making process to work (Gansler, 2000).

Industrial Preparedness and the Decision-Making Process

The basic American approach to solving an international crisis is to seek a non-military solution and use military force only when vital interests are directly endangered and other means fail (Brown, 1983). This approach is reflected in the way the defense department makes its decisions as to what armaments to buy and how to equip its forces. Traditionally, the United States has not procured war material from one dedicated arms manufacturing base. Instead the DoD has a decision-making process that encourages the existing American commercial industrial base to produce the means to fight the nation's wars.

Sammet & Green (1990) stated,

> In 1983 an Air Force study on mobilization was sent to the Joint Chiefs of Staff who commissioned a follow-up study to probe further into the problems of surge (industrial capability) and mobilization. This second effort confirmed the findings of the Air Force study: all precision-guided munitions require rolling inventory to surge, and 19 of the 24 precision-guided munitions studied required additional special tooling and test equipment to surge. The final conclusion was that the cost for rolling inventory for 20 precision-guided munitions was reasonable at $1.45 billion. In the ensuing years, little has been done by any service to implement the recommendations. (p. 80)

Civilians have customarily directed this acquisition decision-making process, with military officers playing relatively minor roles (Gutmanis, 1997). With the collapse of the military threat from the former Soviet Union, coupled with a steady decline of fiscal resources available to the United States military, the DoD is already adapting to a series of unprecedented changes in its acquisition structure.

The military services during the 1990s introduced profound changes to the DoD's financial and resource management systems, as compared to when McNamara first introduced PPBS. The Defense Performance Review (DPR), Chief Financial Officer's Act (CFO), and Government Performance and Results Act (GPRA) all generated policy and legislation demanding considerations and measurements of efficiency to the DoD acquisition community's decision-making process (Gutmanis, 1997). Public functions that fail to meet the call for this style of improved efficiency are currently being reviewed for potential privatization (Weidenbaum, 1992).

Improvement in the decision-making process has taken many turns when viewed from a historical perspective. Historically, public fiscal activities have significantly impacted the decision-making process. These impacts were focused on the expenditures and termination of a particular program's budget rather than on just reducing the total amount of money in that program (Gansler, 1995). In 1989, cumbersome rules and procedures associated with the public procurement decision-making process contributed to acquisition's inherent lack of efficiency (Gansler, 1995). This lack of efficiency is illustrated by the extremely long period of time in which it takes the DoD to make a decision (Fox & Field, 1988). Then, after a decision is made, it is reviewed again during the next fiscal cycle. This process of revisits to previously made acquisition decisions

presents the decision maker an endless loop in which he or she is constantly explaining past circumstances for past decisions while continuing to make new decisions (Sammet & Green, 1990). Hence this process tends to become very conservative and decision-makers are reticent to make "too radical" decision for the current and/or future force structure.

The secretary of defense has authorized a waiver authority for senior DoD decision makers to mitigate many of the traditional obstacles in an attempt to improve the decision-making process (Perry, 1994). This is an attempt to put trust into DoD decision makers by letting them know that the DoD will stand behind their reasonable decisions (Kapstein, 1992). Therefore, the decision makers have increased their flexibility and willingness to implement processes aimed at increasing the decision-making process within the DoD. Two improvements currently underway that may help the decision process are business process reengineering and improved cost estimate methods (Kapstein, 1993).

DoD is embracing business process reengineering as a key element in its effort to enhance the decision-making process. Hammer and Champy (1993) define business process reengineering as "the fundamental rethinking and radical redesign of the business decision-making process to bring dramatic performance efficiency to DoD decision making" (p. 31). The comptroller general of the United States, Charles A. Bowsher, states, "Reengineering and modern technology offer huge opportunities to reduce federal costs and improving the quality of government decisions" (GAO/T-OCG-95-2, 1995b, p. 1). Bowsher also states "we support these reengineering efforts and will continue to evaluate DoD's progress in fundamentally improving its business decision processes" (GAO/T-AIMD-95143, 1995a, pp. 11-12).

Having examined history, structure, issues, and previous reform attempts of the defense acquisition decision-making process, the Chapter 4 illustrates the influences upon that decision-making process.

CHAPTER 4

INFLUENCES UPON DEFENSE ACQUISITION DECISION MAKING

> In the application of decision analysis, a problem is decomposed into clearly defined components in which all options, outcomes, values, and probabilities are depicted. Quantification in the form of the value for each possible outcome and the probability of those values (or costs) being realized can be in terms of objective information or in the form of quantitative expressions of the subjective judgments of experts. In the latter case, the quantitative expression serves to make explicit those subjective qualities which would otherwise be weighted in the decision process, albeit in a more elusive, intuitive way. (Barclay, Browne, Kelly, Peterson, Philip, & Selvidge, 1978, page vii)

Problems requiring complex decisions are difficult to resolve for a variety of reasons. Frequently, solution options are not clearly defined, the results that might be achieved by opting for one choice over another may be highly uncertain, and it is often difficult to determine the relative merits to be derived from the possible decision outcomes (Wildavsky, 1984). Usually, an individual's reaction when faced with this dilemma is to devote more thought to various devices to resolve the decision (Barclay et al., 1978). Examples of these devices to help sort out the decision alternatives include listing the "pros" and "cons" for each option, rank ordering preferences, or listing the things that could go wrong and evaluating the consequences from each failing (Lynch, 1995). This approach in decision making is similar to the pathway chosen in the DoD acquisition process, albeit the DoD uses a much more detailed and formal way.

One reason the defense acquisition decision-making process is so detailed is because the decisions being discussed have repercussions on spending literally tens of billions of the taxpayers dollars each year and proper accounting for the public monies spent is necessary (Sammet & Green, 1990). Another reason the defense acquisition decision-making process is detailed is that this decision process is responsible for procuring the weapons used for the defense of the nation. The third reason the process is so detailed is that, as this chapter illustrates, there are numerous influences upon the defense acquisition decision process that make it a convoluted process. If the decision process becomes cumbersome by undue emphasis on these influences vice efficiently operating it shall ultimately fail in reaching its ultimate objective (Elam, Henderson, & Miller, 1980).

Independent Factors

There were six independent factors found in the literature of the defense acquisition decision-making process. These six independent factors are the influences on this process and shall now be examined: (a) the DoD budget process, (b) the mission of the military, (c) the actors within the defense acquisition decision-making process, (d) metrics used to measure the acquisition program during the decision process, (e) congressional guidance found within law, and (f) increased use of high technology in today's military weapon systems.

Each of the independent factors are briefly introduced and then the remainder of the chapter discusses each in detail. Chapter 5 illustrates these influences via three case studies upon the acquisition decision-making process.

The most important independent factor is the "budget process" of the U. S. federal government. The specific budget allocation and the yearly changes to allocations as expressed in the defense budget have significant influence upon the DoD acquisition decision process. It is only with the expenditure of these funds that defense acquisition programs are designed, developed, and procured. This section illustrates how the changes to the funding levels designated in the annual defense budgets, either as exhibited by an increasing or decreasing trend or the yearly perturbations to the budget account, adversely affect the decision-making process.

The second independent factor is the changing emphasis upon the military to perform "non-traditional" military missions. Today's security environment and political arena has influenced a dramatic change in the missions assigned to the military. This section examines the impact to the defense acquisition decision-making process as a result of changing the traditional military missions in today's environment. Traditionally, the U.S. military maintained large numbers of forces and equipment for major battles on land, at sea, and in the air; however, today's military structure is changing into a streamlined military force which, while the military is still responsible for traditional roles, it is also focused on emerging and diverse missions such as humanitarian service, peacekeeping and nation building (Quinn, 1994).

The third independent factor is an examination of the specific actors within this decision system. Analysis of this factor focuses on an examination of the impact to the defense acquisition decision-making process by different individuals who have had dominant positions of responsibilities in the DoD and Congress. This section includes a comparison of the influence in the decision process of political appointee vice the career

government bureaucrat. Also examined is the role of the uniformed military officer versus his or her civilian counterpart.

The fourth factor examined in this section is the impact to the decision-making process based upon the metrics used during the decision-making process to subjectively or quantifiably estimate the program's success. Highlighting this section is the determination of the value of measuring the cost of the acquisition equipment being purchased and that perceived influence upon the decision-making process. The question under study in this section is how to measure the success of an acquisition program, and whether measuring cost, schedule, and technical performance are good means to measure decision-making process in relation to weapon system expectations.

The fifth factor is the impact to the decision-making process when congressional guidance is expressed towards a specific acquisition program. Specifically, this section addresses how Congress influences the decision-making process. This influence is based upon examples of how congressional language and specific funding levels directed by Congress have influenced the acquisition decisions made by the DoD.

The sixth and final factor to be examined is the impact on the defense acquisition decision process with the increased use of high technology in military weapons. The United States military has made a conscious decision to buy "quality" weapons (Binkin, 1986). Examples of these quality weapons could be labeled as "smart bombs" and "stealth aircraft." This section examines how this strategy of acquiring these types of weapons has influenced the decision-making process.

Factor One: The Military Budget

Budgeting is an important topic within both the academic discipline of public administration and the public institution of the DoD. The Defense Department budget has gone through a great deal of turmoil in the last 20 years (Fox& Field, 1988). The Carter administration reduced the military budget from the high watermark of the Nixon and Ford administrations, and then the Reagan presidency greatly expanded the military budget even beyond that of Nixon and Ford (Gansler, 1989). George H. Bush tried to maintain a strong economy by cutting the military budget; however, he concurrently advertised a strong military, and used its strength with a quick victory in the 1991 Gulf War (Cohen, 1997a). Clinton established a strong economy by cutting the military budget but was not tested by a major military battle, and George W. Bush has again increased the DoD budget.

These constant perturbations to the total DoD budget "top line" have had significant impacts to the acquisition programs in the defense decision process (Kapstein, 1992). Additionally, these changes to the military budget influence almost all segments of the country, as exhibited by the large number of mergers of defense companies and the number of firms leaving the defense arena of work (Gansler, 1995). Consequently, the American defense industrial base has had a difficult time predicting future DoD workload as each presidential administration changed the funding levels for defense acquisitions (Weidenbaum, 1992).

Budget decisions are important because they shape government programs (Kapstein, 1992). Budget issues are also important because they shape two central and recurring budget questions. This first question that the budget asks is what should

government do? (Lynch, 1995). The essence of budgeting is about fundamental social decisions on the use of the nation's limited financial resources. How much should society ask the government to do with public resources, and what activities should be left in private hands? Since resources are scarce, what programs deserve support and how is that decision made? Because of the centrality of these questions to American society, budgetary politics is enmeshed in perpetual conflict across the spectrum of public policy (Hartman & Wendzel, 1994).

The second question that the budget asks is who in government should decide these budget questions? Throughout the history of the U.S., the balance of financial power has shifted between the national and state (and to a lesser extent to local) governments and between the legislature and the executive branches at all levels of government (Aaron, 1990). The budgetary arena has been the continuing forum for broad policy disputes over not only who should benefit most from government programs but also who should make those specific decisions (Lynch, 1995).

At the federal level, preparing the next federal budget begins in early February each year as the previous year's budget goes to Capitol Hill (Davidson & Oleszek, 2001). Each year, during early spring, the Office of Management and Budget (OMB) collects information from all government agencies about how much money they want for the upcoming fiscal year, both to administer existing programs and to fund the list of potential new programs. OMB uses these requests for funds to prepare its spending projections, while the Department of the Treasury concurrently prepares the estimates of collecting revenues via the various tax sources (Collender, 1996). Then the staff members from the OMB, Treasury, and the President's Council of Economic Advisors gather

together to assemble the total implications of these fiscal projections for the upcoming budget. This synthesis of projections is made each year in June when the decisions to support specific programs then focuses on the major "policy issues" contained in the budget submission (Fesler & Kettl, 1991).

The change in the yearly total of budgeted funding from the previous year's funding appropriated by Congress can be called budget turbulence (Fox & Field, 1988). Budget turbulence is the financial black hole of the defense acquisition decision-making process. One seldom reads in newspapers about the impact of this "black hole" because the practices that lead to this turbulence make much less colorful and understandable news than do the lead articles of significant cost over growth--for example, the infamous over-priced coffee pots and toilet seats episodes (Kapstein, 1992). However, budget turbulence is an essential element in the DoD's decision-making process and it is this turbulence that is the root cause for the majority of other defense acquisition decision-making problems (Fox & Field, 1988). Therefore, an examination of this turbulence follows and its impact is illustrated in case studies in Chapter 5.

Acquisition projects, for a variety of reasons, are started, stopped, accelerated, or slowed; budgets are increased or decreased; schedules, objectives, designs, and even the number of people working these programs are continually changed within the program structure (Hartman & Wendzel, 1994). All of these perturbations drive the actual price of the weapon system dramatically upward, which further adversely impacts the decision-making process (Fox & Field, 1988). Additionally, this turbulent action in the program's decision-making process slows the program in its development. Slowing of the pace of the acquisition program development is the "mother lode" of waste in the defense

acquisition management system (Spinney, 1982). A major acquisition reform effort to address this type of budget turbulence is called "multiyear funding" (Wildavsky, 1992).

Multiyear funding is an acquisition decision making technique that identifies a steady stream of funding for a finite number of years and locks in the necessary funding to accomplish an agreed upon level of procurement (Gansler, 1989).

The result of multiyear funding is that for that one program the funding turbulence is removed and the program moves at a predetermined steady pace. The "downside" to multiyear funding is that to fund multiyear funded programs, other programs within the military acquisition process that are not designated as multiyear funding programs have dramatic reduction in funding (turbulence) in their individual program budgets to make available the necessary monies for those multiyear funded programs. This perturbation to their program is to make up for the protected or "fenced" (DoD jargon for protected from fiscal cuts to their funding allotments) funds in the multiyear funding programs (Gansler, 1989). Consequently, there are very few major multiyear programs. The FY 1999 examples of these major program multiyear acquisition programs are for the Air Force the C-17 cargo aircraft and F-16C/D fighter aircraft; for the Navy the F/A-18E/F fighter aircraft; and for the Army the Longbow Apache helicopter, UH-60 Blackhawk, and CH-47 cargo helicopter (Mann, 1999).

The average time for the acquisition of a typical major weapon system program is 10 to 15 years (Fox, 1972). Any significant change, for example a reduction to the program funding during this extended period, has the potential for significant turbulence to the overall length of time the program remains in the acquisition process. Specifically it is usually exhibited by spending a longer period of time in the phases of engineering

and production. During this extended period of time, there is ample opportunity for significant national issues to have further influence upon the federal budget, which then again can have additional perturbations to the DoD budget (Gansler, 1989).

Another instability in the budgetary process causing instability for defense decision makers is the difficulty that is sometimes encountered by Congress in producing a budget by the beginning of the federal government's fiscal year (Davidson & Oleszek, 2001). To alleviate the ceasing of all government activity when Congress does not pass the federal budget in time of the beginning of the fiscal year, Congress has enacted the process known as "continuing resolution" (Collender, 1996, p. 178). During periods of time when "continuing resolutions" are empowered, federal agencies are allowed to spend money on previous fiscal years' authorized programs at a rate commensurate with the monthly amount appropriated from the last fiscal year (Davidson & Oleszek). However, "continuing resolutions" are not a panacea for budgetary instability. During these same periods of time when "continuing resolutions" are used, disagreements among congressional committees over the exact level of the future funding for ongoing acquisition efforts sometimes leave defense program managers with a dilemma. These program managers have to decide whether to spend at the lower limit of the rates being debated by congressional committees, thereby having a budget reduction become a *fait accompli.* Or, the program managers could decide to spend at the higher limit, thereby running the risk of violating the law by not being able to cover the costs if the funds were ultimately denied (Jones, 1992). In either case, if the program managers decided wrongly their program could be adversely impacted.

> Frank Carlucci, the former defense secretary, calculated that from 1970 through 1988, had the Defense Department each year simply been given the same "real dollars" that it received in 1970 – well before the President Reagan buildup and subsequent draw – down, approximately the same amount of money would have been available to the defense department without all the congressional wrangling and could undoubtedly have been spent far more efficiently. (Adelman & Augustine, 1990, p. 181)

Because of real and perceived abuses in weapons acquisition, Congress has felt the need to direct DoD to accelerate its efforts to tighten and improve internal decision making procedures (Wildavsky, 1992). Thus, in recent years, significant federal laws have been enacted that have resulted in new regulations and organizations to manage defense acquisitions:

> The expanding authority of Congress has had cascading effects throughout the acquisition community. Oversight begets oversight at all levels; no management level wants to be surprised by lacking knowledge of activity. Consequently, the DoD acquisition manager is under increased scrutiny, must maintain scrupulous records, is subject to unsolicited second-guessing, must make frequent schedule and funding adjustments, and must continuously advocate his program. Whether this increased congressional involvement accomplishes its purposes efficiently, timely and in a businesslike manner is open to conjecture. Nevertheless, it is a fact of life. (Jones, 1992, p. 5)

Another version of this dilemma of direct oversight that affects detailed program execution for the program manager took place in regard to the inflation rate forecasts during the President Carter administration. OMB habitually issued what appeared to be intentionally low inflation rate forecast, because it was believed that an officially sanctioned increase in projected inflation rate would almost certainly turn into a self-fulfilling prophecy (Weidenbaum, 1992). Unfortunately, the defense acquisition program manager, seeking to determine how large a factory to build in order to manufacture his or her program, or how many machines to procure, or how many employees to hire, was

faced with the virtual impossibility of performing realistic long-range planning (Adelman & Augustine, 1990).

Budget turbulence also takes its toll on human incentive and morale. Because of the tendency to overestimate the amount of future funding that will be available for national defense (Spinney, 1982), more defense programs are initiated than can ultimately be prudently fiscally funded and supported (Wildavsky, 1992). Outright cancellations to acquisition programs or the inefficient stretch-outs of the specific phases of acquisition milestone periods are the direct results of this tendency to overestimate the amount of future funding to be made available (Sammet & Green, 1990). Compounding the problem of overestimation of future funds to be made available for an acquisition program is budgetary problems caused when costs of the individual programs have been underestimated by the contractors (Spinney). Because of these two estimation mistakes, there is an increasing difficulty in achieving realistic budgeting estimates, which then impact Congress to accurately fund the programs. Industry has traditionally been guilty of creating extremely optimistic estimates--sometimes to the point of irresponsibility--because of its desire to win the competition for new contracts (Fox, 1989). Compounding the problem, the military services, seeking congressional approval of the new weapon system, are sometimes perceived to overstate future weapon system capabilities (Jones, 1992).

Enormous uncertainties legitimately exist, especially in estimating the cost of the research and development of a new revolutionary weapon system (Weidenbaum, 1992). Depending on how conservative or optimistic one may wish to be, cost estimates can vary

widely. The implications to this inconsistency in cost estimation is accurately captured in the following quote by Adelman and Augustine, 1990):

> Instituting defense acquisition programs based on overly, optimistic cost estimates made by the various would-be recipients of the funds--who will inevitably require additional funds than originally budgeted--is like trying to deliver lettuce by a rabbit. (1990, p. 185)

Importance of budgeting. Public budgeting is a decision-making process (Wildavsky, 1992). Not surprisingly, there are several theories as to the best way to make these public policy decisions. These theories or conceptual models are important because many people try to reform public budgeting using one of the theories as their guide. These tasks must be accomplished within the decision-making context largely induced by the ideologies of the culture that the institution exists (Barclay et al., 1978).

Before examination of the merits of this approach, the need exists to define the term "model." A conceptual model can be viewed as a tool that enables the user to understand complex phenomena. Practitioners in public administration should judge conceptual models in terms of the model's usefulness in helping to accomplish its individual task. These tasks must be accomplished within a decision-making process largely induced by the ideologies of the culture of the public institution from which they are to be applied, in this case the DoD (Lynch, 1995).

Public budgeting in the United States must be conducted in both a political and practical environment. The democratic ideology has helped to define the political environment with consensus and partisan adjustments to best explain the political context. Public budgeting must be accomplished in a timely manner; ergo, decisions must

be made at a pace to accommodate the other decision processes that are impacted by the budget process (Adelman & Augustine, 1990). Examples of some of these other decision processes that are impacted by budget formulation in DoD include industrial contract signing and congressional hearing cycles. Collender offers the following observation of this interactive process:

> Two steps must usually occur before the federal government can spend money on any activity. First, an authorization must be passed allowing a program to exist. The authorization is the substantive legislation that establishes the purpose and the guidelines for a given activity and usually sets the limit on the amount that can be appropriated. The authorization does not, however, provide the actual dollars for a program or enable an agency or department to spend funds in the future.
>
> Second, an appropriation must be passed. The appropriation enables an agency or department to make spending commitments that eventually lead to dollars being spent (Collender, 1996, p. 1)

Lynch (1995) offers a list of three decision-making models. These illustrated models are the incremental change model, the satisficing model, and the ideal-rational model. To this list, he adds a provocative but little-cited model called the *stages of the problem-solving model.* The incremental model is used for descriptive and normative purposes, but just because something exists in a certain way does not mean that it should continue to exist (Lynch). In the incremental model, major public policies evolve through a series of cautious incremental steps, which is very similar to the previously described Lindbloom's (1959) theory of Incrementalism. Political forces adjust their positions and public policy as small incremental decisions are made with limited risk to the decision makers, because this is an evolving process. This inherently conservative approach biases the decision makers against radical, innovative alternatives.

The satisficing model points out the decision-making process develops a criterion to judge acceptable policy alternatives for a given problem (Lynch, 1995). Then the

model searches the alternatives and selects the first acceptable alternative it discovers. The time available to reach a decision is a significant factor in the satisficing model. Alternatives are considered, but due to the limited time and resources expended, the ideal solution is not necessarily found--the "acceptable" is the standard for this model. This model is similar to Herbert Simon's (1976) decision making concept of "satisficing."

The rational model is most commonly cited as the ideal way to reach decisions, especially major public policy decisions such as public budgeting (Lynch, 1995). The rational model systematically breaks decision making down into six phases:

1. establish a complete set of operational goals, with relative weights allocated different degrees to which each may be achieved;
2. establish a complete set of the alternative policies open to the policy maker
3. prepare a complete set of valid predictions of the cost and benefits of each alternative, including the extent to which each alternative will achieve the various operational goals, consume resources, and realize or impair other values;
4. prepare a complete set of valid predictions of cost and benefit of each alternative, including the extent to which each alternative will achieve the various operational goals, consume resources, and realize or impact other values;
5. calculate the net expectations each alternative by multiplying the probability of each benefit and cost for each alternative by the utility of each, and calculate the net benefit (or cost) in utility units; and
6. Compare the net expectations and identify the alternative (or alternatives, if two or more are equally good) with the higher net expectations. (p. 19)

Although similar to the rational model, the stages of the problem-solving model is amenable to observation and analysis, but it too can be a normative model. The starting point is the perception that a problem exists, not the formulation of goals. This perception permits the possibility of multiple value perspectives, whereas in formulating goals, one tends to ignore the possibility of multiple values. Either formally or informally, the decision-making process defines the problem, considers the solutions, and analyzes the

alternatives in a manner similar to that of someone using the rational model (Lynch, 1995). A key decision is then made either to reconsider the nature of the problem or to plan to resolve the problem. Note, however, this reconsideration step is not part of the rational model. If the decision is made to proceed, the necessary action steps are taken and the various outcomes are evaluated (Lynch).

With the incremental change model, the public institution decision-makers can better understand how the fiscal realities of the budget process is dominated by the strategies employed by and the conflicts that arise among the participants, for example: clientele groups, agencies, departments, and OMB. The satisficing and ideal-rational models are useful for understanding difficulties with the decision-making process. The satisficing model dramatically emphasizes those decisions, which are made under time or political or fiscally constrained pressure, and severe limitations make achieving even a satisfactory alternative a rather significant accomplishment (Lynch1995).

Public budgeting in the United States must be conducted in a political, human, and often practical environment (Lynch, 1995). The democratic ideology has helped to define the political environment. Consensus and partisan adjustments best explain the political context. Public budgeting is conducted by humans and it is affected by humans; thus emotional drama of "human error," "pride," and other human characteristics help define the context of the budgeting process (Lynch).

> There is a fiscal impasse in American politics. But I must insist that it is not primarily an impasse between the president and the Congress. The impasse is a Main Street impasse. . . . We love low tax rates. At the same time we insist on social security, health care programs, defense expenditures, bank insurance, farm aid, and a safety net for unemployed, handicapped and the aged (Davidson & Oleszek, 2001, p. 386)

These above implications have direct reference to the top line budget given to the DoD. As the Congress determines what the total funding for the DoD will be, they allow, within specific guidelines, for the DoD to move some of that money around the various acquisition programs. Also, Congress identifies in the budget specific sums of monies to be spent on specific programs--"*pork*"--in some cases (Fox & Field, 1988).

The implications of both of these actions is that the DoD truly has very little discretion as to the decision-making process within its own acquisition process, for the Congress appropriates the money, identifies certain programs to be given certain levels of funding, and withdraws amounts of funding as it deems necessary (Sammet & Green, 1990). This management of the program by Congress can assume several approaches. When there is a controversial acquisition defense program and it is the "will" of Congress not to be recognized as the terminator of that controversial program then the Congress is able to request several studies be performed before a certain threshold of funding can be spent on this same program. Through this effort, money and time spent on these identified studies could have been spent on the "programmatics" of getting the program through the acquisition decision-making process. Hence it is similar to a zero/sum game in which these same funds cannot be spent on developing the program, but by necessity must be spent on explaining some element of why we have the program (Collender, 1996).

One prescription for "rationality" decision making in solving problems of calculation is to engage in comprehensive and simultaneous "means-end" analysis. Budget officials soon discover that all members of the decision-making group rarely agree upon the objectives ("ends") of this decision-making process. These "ends" and "means" keep changing throughout the 10- to 15-year acquisition decision process as

more and more information becomes available (Bennett, 1974). For example, Congress is making greater use of "creative accounting" practices.

Need for proper accounting. A concern that focuses on the influence of the budget is the validation of the accuracy of the entire federal accounting system. One result of this influence, as Charles Lindbloom (1959) has demonstrated, is that although this comprehensive approach can be described in theory, it cannot be practiced because it puts too great a strain on man's limited ability to calculate all consequences of all decisions. What budget officials need are operational guides that will enable them to accomplish these requisite calculations (Wildavsky, 1984).

Weak accounting systems have sometimes cost the government millions of dollars. The GAO, for example, discovered that 18 federal agencies paid 25% of their bills late, which cost the government millions of dollars in penalties (Fesler & Kettl, 1991). Another 25% of the bills were paid too early, which meant that the government often had to borrow money, which cost the government $350 million annually in lost interest (Fesler & Kettl). The DoD meanwhile could not account for over $600 million that foreign customers had forwarded to purchase weapon systems--as a result, billions of dollars are not adequately accounted for or financially controlled (Fesler & Kettl).

With increasing frequency, decision makers must tackle issues on the edge of known knowledge, where experts disagree and the road ahead is uncertain, this occurs most frequently in the beginning phase of a weapon acquisition program (Sammet & Green, 1990). Indeed "risk taking" is the first cousin of uncertainty and the costs of being

wrong can sometimes be catastrophic. This uncertainty makes just using one approach to decision making an inadequate guide (Fesler and Kettl, page 186)

The above paragraphs identifies the complexity of the decision-making process in its relationship to the budget. Perhaps in closing we should focus on the budget in the most general terms. Budgeting is concerned with the translation of financial resources into human purposes. A budget, therefore, may be characterized as a vision of the future with the necessary price tags attached. Since funds are limited and divided among choices, the budget becomes a mechanism for making decisions among the alternatives. When choices are coordinated to achieve desired goals, a budget may be called in its simplest term "a plan for the future" (Wildavsky, 1984, page2)

Factor Two: The Issue of the Changing Military Missions

We live in an age of great change in the environment of global military security (Steinbruner, 1989). At the low level of combat intensity in conflicts, the sources of this insecurity range from private sect sponsored international terrorism and insurgency through national radicalism or religious fanaticism (Adelman & Augustine, 1990). The upper levels of combat intensity of military conflicts include the poised armies of NATO and/or the use of nuclear weapons ready to be launched in an instant from missile silos, submarines, and aircraft from around the world (Cohen, 1997a). For the overwhelming majority of the world's people, peace is clearly the desired objective; it is, however, not necessarily held as the most important objective by all the inhabitants of the globe (Hartman & Wendzel, 1994). In today's convoluted security environment, most informed

people feel that a nation must use both diplomatic and military strength to ensure the continued security of its people (McRae, 2001).

It is very expensive to maintain the military strength of the United States. At the end of the 1970s, the U. S. was spending approximately $109 billion a year on its defense establishment (1979 DoD Budget). The American public voiced their opinion that this level of force structure did not provide a "strong America" and stated so by electing President Ronald Reagan with a mandate for significant increases in the defense budget (Adelman & Augustine, 1990). Within 6 years of Reagan's election, the defense budget had almost doubled and an extra trillion dollars had been spent on increasing America's military power (Weidenbaum, 1992). Yet, by the end of the Reagan Presidency, the population was crying about a "budget crisis" (Adelman & Augustine). Many new acquisition weapon programs were already on the drawing boards--such as a strategic defense missile system, a new generation of "stealth" aircraft, and a new generation of armored vehicles. However, what could not be delayed was the DoD acquisition decision-making process and so this process was accelerated to allow these potential systems to go quickly into the production (Adelman & Augustine). To assist this acceleration in the decision-making process, this period of time was also marked with an increase in the number of "black world" defense programs, or, in the Pentagon jargon "special access required," which was usually abbreviated as "SAR" (Kaminski, 1997). Furthermore, political and diplomatic agreements to control the spread of nuclear arms brought demands for increased quantities of expensive conventional weapons to counter the then Soviet Union's overwhelming numerical superiority in that conventional weapon category (Gansler, 1989). Also, there was a growing expectation that regional

conventional warfare scenarios were to be the next most likely future military scenario and the ones that this nation was least prepared to win (Spanier & Wendzel, 1996).

The traditional solution to these types of problems of a changing national military strategy had been to simply increase the defense budget. However, there are many other competing demands on the country's finite fiscal resources. Among these competing demands were the national debt; the valid calls for refurbishing of the nation's highways, bridges, harbors; and economic issues like the trade imbalance (Bennett, 1974). Other continuing demands for the nation's public funds included the need to revitalize the nation's industrial competitiveness and the nation's growing needs for health care, education, Social Security, and child-care programs (Kegley & Wittkopf, 1991). Thus, an increasing number of people began to question the affordability of increasing the strength of the American military (Gansler, 1989).

The essence of today's debate on mission. Too much of the core competencies of each military service is at stake and therefore vulnerable to be lost during a debate on missions (Gansler, 1989). The military services would rather work at the margins of their turf through bargains and agreements among themselves, than in open public debate of military missions. Congress, whose concerns lie elsewhere than the traditional missions for each of the armed services, is now provoking the debate on future military missions (Davidson & Oleszek, 2001).

For Congress, the issue of the debate on missions is not a service turf battle but their perceptions of waste in the form of duplication of military capability. For example, Why does the country need to make acquisition decisions for four different tactical air

forces? Why not make the acquisition decision-makers' lives simple by having just one tactical air force to defend the nation? Why do we need three different space programs, one for each of the military departments? Why do we need two ground forces? These are the public's questions being asked of their political representatives that will fuel the debate, especially now, when there is limited funding and no clear national threat to our country's existence.

For these reasons, the stated or public posture adopted by the military services in the mission debate will not necessarily reflect their real concern, interests, or motivations. The service express concerns that can project insight to their vulnerabilities and which they may very reasonably prefer not to reveal. With the possible exception of the Marine Corps, the services are uneasy about the future. The Marine Corps has taken steps into a new realm of battle, namely "urban warfare." "Recently the Marines seem to be getting into a new domain as they are beginning to get very involved with urban warfare" (Ricks & Sequeo, 1999, p. 10)

Additionally, new medium from where the military actions can participate holds the attention of all the services. For example, mission debate will next focus on potential areas of future operations: "outer space, urban warfare, cyber-warfare, or the use of micro vehicles in warfare" (Mulholland & Seffers, 1999, p. 12). The old paradigm is most likely to be found in missions that are mostly associated with the Cold War, especially when dealing with nuclear forces and massed armies warfare. These are the ones that no longer go to the hearts of the services, and they will be easiest ones for which the services might accept transfers in ownership. If the changes that evolve from the debate can be limited to these "old think" paradigms then the military services will be able to breathe easier. But

as the debate over future missions continues, then the defense acquisition decision-making process must address the two-fold needs of the military services and obtain the necessary weapons for both current and future conflict. Therefore, the DoD acquisition decision-making process is affected by these debates and the realities of potential future war, while supplying today's military security needs.

Factor Three: The Actors Within the Defense Acquisition Decision Process

With defense acquisition costs in the 1980s exceeding $115 billion annually, and accounting for more than 40% of the entire defense budget, (1999 AF Acquisition Fact Book), it was prudent that the DoD and Congress focus on possible acquisition streamlining and reform initiatives. In response to the public criticism of sensationalized cost overruns, faulty weapon system performance, and perceived contractor fraud, the Reagan administration appointed David Packard, former Deputy Secretary of Defense, to lead the Blue Ribbon Commission on Defense Management. This committee was then commonly referred to as the Packard Commission (Weidenbaum, 1992).

In 1986, the Packard Commission identified numerous shortcomings in the acquisition process and recommended several improvements. These recommendations became the goals for subsequent legislation, Presidential directives, and DoD regulations. The result was a major restructuring of how OSD and the military services conduct acquisition decision making activities (Fox & Field, 1988).

This committee evaluated the defense acquisition decision-making process, its organization and structure, the congressional oversight process, and the military command structure. The Commission's major task was to determine whether the

implementation of private sector methodologies could improve defense management business practices (Santo-Donato, 1992).

The Packard Commission reported that cost, schedule, and performance problems in weapon system procurement were attributable to an unproductive decision making and management system (Kapstein, 1993). This system lacked, among other things, "(1) clear accountability for acquisition execution and (2) unambiguous lines of authority for individuals with program decision making responsibilities" (GAO Report, 1990a, p. 1). Another assessment was that the program manager's effectiveness in executing his/her program suffered from the excessive time spent on preparing reports in lieu of making acquisition decisions on issues facing the program (Brooks, 1991).

The Packard Commission report made some key recommendations to rectify observed structural and procedural weaknesses in the DoD acquisition decision-making process. One recommendation was that each military service should institute a three-tiered organizational structural for all major defense acquisition programs (Pinney, 1998). This structure would consist of an SAE, responsible for all service acquisition matters; the PEO, individually responsible for a limited group of major programs; and the PM, responsible to the PEO for all matters within a specific program (GAO, 1990a). In spite of the benefits this new position offered, its insertion into an existing decision system and organizational structure complicated the already existing roles and responsibilities of other acquisition officials (Pinney).

Furthermore, to achieve more efficient and effective management structure, this new acquisition structure should revise its practices and procedures to emulate the

decision-making characteristics of the most successful commercial projects. Among these characteristics are:

1. clear command channels--clear alignment of responsibility and authority, preserved and promoted through short, unambiguous chains of command to the most senior decision makers;
2. program stability--a stable environment of funding and management, predicated on an agreed baseline for cost, schedule, and performance
3. limited reporting requirements--adherence to the principle of "management by exception", and methods of ensuring accountability on the agreed baseline;
4. small high quality staffs--reliance on small staffs of specifically trained and highly motivated personnel;
5. communication with the users of the weapon systems be acquiring--sound understanding of user needs achieved early on and reflecting a proper balance among cost, schedule and performance considerations; and,
6. better system development--including aggressive use of prototyping and testing to identify and remedy problems well before production, investment in a strong technology base that emphasizes lower cost approaches to building capable weapon systems and increased use of commercial-style competition (Reeves, 1996, pp. 43-45)

Two contemporary laws also played a role in establishing this new acquisition decision-making process for the DoD. First, was the Goldwater-Nicholas DoD Reorganization Act (Public Law 99-433) in 1986, which sought "to reduce the bureaucratic layering and duplication existing within the DoD acquisition decision-making process, and to produce acquisition programs that would better meet cost, schedule, and performance criteria" (Santo-Donato, 1992, p. 41). This law designated within OSD the new position of the Undersecretary for Defense Acquisition and Technology--USD (A&T). The second law, the National Defense Authorization Act for Fiscal Year 1987 (Public Law 99-961), outlined the duties, responsibilities, and authority of the USD (A&T; Brooks, 1991). These laws delineated that the role of the USD (A&T) is the DoD senior acquisition decision maker.

Unfortunately, this second legislation did not achieve the desired change in the DoD. Congress soon began to criticize the Pentagon for failing to complete the acquisition reforms that were recommended by previous commissions (Willis, 1990). According to the GAO report (1990a), the Services were fixing new titles to existing positions in the same old organization structure, failing to empower the PM-PEO-SAE chain of decision making with the necessary authority, and failing to eliminate the unnecessary intermediate management layers.

In response to criticisms, President George H. Bush directed the Defense Management Review (DMR) in February 1989 to "Review DoD management and decision-making processes and develop a plan to fully implement the Commission's recommendations, improve the acquisition decision-making process, and more effectively manage DoD resources" (GAO Report, 1990a, p. 2).

By December 1990, the GAO reported that the Services had taken action to revise their acquisition structure and decision-making process to comply with the Commission's intent. What remained was DoD's updating of its implementation guidance, policies, and procedures to reflect the DMR changes. The DoD took the necessary steps in the following months to implement these changes. For example, DoD Directive 5000.1 "Defense Acquisition" (Department of Defense Instruction, 1996); DoD Instruction 5000.2, "Defense Acquisition Management, Policies and Procedures" (Department of Defense Instruction, 1991); and DoD Directive 5000.49, "Defense Acquisition Board," all address the specific roles and responsibilities of the Defense Acquisition Executive (DAE), SAE, and PEO (Santo-Donato, 1992).

DoD asserted that the implementation of this directive would yield improved effectiveness and cost avoidance in weapon system acquisition decision making, with projected savings. The then Secretary Of Defense, Dick Cheney, stated that these funding savings would be applied to readiness, to modernization, to maintain force structure, and to improve the quality of life for military service members (Fulghum, 1990).

Influence of the acquisition personnel structure. At the very top of the acquisition community are the presidential appointees, who fill the key positions in the various DoD secretarial positions that provide management and oversight of acquisition activities (Stillman, 1996). While serving in this capacity, financial divestiture requirements and ambiguous conflict-of-interest legislation serve as significant and growing disincentives for experienced industry executives to come into federal employment (Bennett, 1974). To take these federal government positions, the appointees usually experience significant reductions in their pay compensation. Being limited to offer a lower pay package to potential workers, while still seeking experienced decision-makers, the goal of recruiting, hiring, and employing experienced successful decision-makers becomes even more difficult (Bennett). As Jacques Gansler (1995) has pointed out, most of the conflict of interest legislation written in recent years including that passed at the end of the 1986 congressional session was intended primarily for civilian and military career personnel leaving the government employment for private industry. The intent of this legislation was to disallow government employees from setting themselves up for lucrative positions in private industry subsequent to government employment, or from benefiting a prospective employer through actions taken while employed by the government. Instead,

the legislation serves today as a deterrent to successful industry managers to accept DoD critical acquisition positions (Gansler, 1995).

Fortunately, as Gansler (1987) has pointed, there are a just a few limited number of these critical acquisition positions--approximately two dozen positions are available to political appointees--throughout the federal government.

Additionally, a new US military organization was formed on October 7th, 1999 which also impacts the defense acquisition decision-making process. The newly commissioned "US Joint Forces Command" was formerly known as "Atlantic Command." This new command was given the added mission to define military strategies, doctrine, training, and tactics that improve the ability of the military services to work together on the battlefield (Holzer, 1999). Implicit in this new mission is the implied task of assuring that all future major weapon system acquisition decisions include the responsibility to assure that new weapon systems being acquired by the DoD are to be "interoperable" with existing weapon systems. This obligation implies a new influence upon the defense acquisition decision-making process (Seffers, 1999).

Other actors in defense acquisition decision making: Industry and Congress. There are others actors in the defense acquisition decision-making process who do not reside at the Pentagon. These other actors include two major groups. The first group is those persons who are found in the private sector and who design, develop, and build the weapon systems used by the American military armed forces. The second group is the congressional elected members and their staffers who authorize and appropriate the public's monies for defense procurements.

The job of government acquisition decision making has been described as promoting a specific weapon system program, preparing program reports, negotiating with the myriad of officials at the Pentagon, and resolving any and all engineering conflicts between organizations and the contractors (Adelman & Augustine, 1990). Some people in government service believe that the responsibility for cost control belongs solely with the defense industry contractor; this pathway to acquisition decision making can be called the "liaison manager" view (Pinney, 1998). This approach is based on the belief that the defense business is just another part of the American free enterprise system; therefore, it is regulated by competition of the already established marketplace.

Other individuals describe the government role as one of planning and making key decisions associated with rigorous oversight of, negotiation with, and control of the industrial firms that perform the development and production work (Pinney, 1998). These individuals believe that the responsibility for cost control belongs to the government program manager and their plant representative, as well as to the contractor. Significant cost reductions are often possible, depending on the government manager's abilities to establish and implement challenging productivity and cost incentives, formal and informal, throughout the life of the program. This approach can be called the "active manager" view, and it is based on the belief that the competitive forces of the marketplace do not by themselves, produce the desired cost schedule nor do they achieve the required technical performance decisions on the large defense programs (Pinney, 1998). In either view, the appropriate management of government procurement requires taking the long-term view of what is best for the nation.

A fundamental issue in the management of defense programs is the need for greater funding stability. The year-by-year congressional review encourages continual adjustment by Congress of the entire DoD acquisition plan and thus limits the effectiveness of any long-range contract agreements (Jones, 1992). The long-term effects of short-term proposals are seldom analyzed or understood. Members of the Congress, as elected legislators, may not be present in Congress to evaluate programs when the program is initiated. Thus, there exists a limited accountability from the contractors, defense program managers and their superiors, and Congress itself. The accountability is then focused on the congressional staffers of the various congressional committees and the senior civilian executives in the DoD acquisition arena. These individuals usually remain throughout the entire 10 to 15 years of a major weapon system's acquisition life cycle (Stillman, 1995).

Members of the House of Representatives have many goals, not the least of which is their reelection every other year. Many of these elected individuals act as if there is never a long enough time between biennial elections to cease campaigning (Stillman, 1995). One method to remain in Congress is to bring money to the people who elect the Congressmen. An example of this is illustrated in the headline, "Defense Bill has Cash for Bay Area" (Adair, 1999):

> Representative C.W. Bill Young is showing why people often put "powerful" in front of his title. Young, the Indian Rocks Beach Republican who is chairman of the House Appropriations Committee, announced Monday that he has earned $100-million for Florida projects in the defense bills that have been signed by President Clinton. That's in addition to the $19-million in non-defense projects for the state that Young announced in the past few weeks. (p. 1)

Senators are not under the same reelection pressure; however, neither are they entirely free from the pressure to provide federally funded benefits for their constituents.

Most voters are interested in steady employment and adequate wages, and they expect their representatives in Congress to work to ensure such stability. Members of Congress are seldom rewarded for looking beyond local needs that most of their constituents do not understand, especially if that goal produces a loss of local jobs (Jones, 1992).

Factor Four: The Acquisition Program as Reflected by Acquisition Process Metrics: Cost, Schedule, and Performance

Most people, who work acquisition process metrics, recognize that it is not easy to identify meaningful metrics that can be conveniently calculated (Dellinger, 1994). The main concern in acquisition decision making is the process to field better weapons systems for the evolving new missions assigned to the military and do it all faster and cheaper (DSMC Risk Management Guide, 1999).

The first problem with developing metrics for the acquisition decision-making process is that it is very difficult for program managers to accurately measure these attributes (metrics), so they become useless as metrics. Therefore, the participants must use other quantifiable "surrogates" instead (of metrics) because these surrogates can be measured. But it is not always clear how these surrogates would contribute to fielding needed systems (Sammet & Green, 1990).

A second problem with formulating metrics is the fact that the success or failure of the acquisition decision-making process is usually determined in retrospect by how well the weapon system has served the military, especially in a battle scenario. Consequently, we assess the success of the defense acquisition process only in the postmortem, after the acquisition decisions have already been completed. Such an

assessment of the decision process would be merely of historical interest and have little practical use during the on-going decision process for the specific weapon system.

For purposes of this analysis, I have chosen to define metrics as follows:

Cost: item price to meet military specification

Acquisition performance: number of required changes to the contract

Schedule: ability to meet the agreed to milestone time line

The key to metrics is effective planning. Acquisition metrics is the numerical values by which an analyst can gauge progress toward meeting specific acquisition objectives. If the overall objective of the acquisition decision-making process is to field the appropriate weapon systems faster, better and cheaper (Bennett, 1974), then a true metric would be a value that enables the decision maker to assess how much faster, how much cheaper, and how much better a given acquisition decision-making process is. Unfortunately, this metric is not directly available to acquisition decision makers. Another problem when working with metrics is defining the terms. For example, the terms, better, faster, and cheaper have so many possible meanings that it is necessary to restrict some of their specific characteristics so that the metric can be accurately measured. Thus to achieve metric analysis a "surrogate" metric must be devised.

A surrogate metric is a measurable characteristic of the acquisition decision-making process that presumably reflects the behavior of the true metric. Because surrogate metrics is not true metrics, we need to know how strongly they represent the true metrics. The following is proposed as an appropriate methodology to determine potential surrogate metrics:

1. Identify the specific segment the decision-making process to be evaluated
2. Identify the pertinent properties of what is to be measured
3. Identify types of potential metrics
4. Select a few metrics and provide a rationale for each specific selection
5. Define bounds on what is being measured. (Pinker, Smith, Booher, 1997, p. 193)

Once it has been determined to use several potential metrics, then analysis can determine which ones are the most useful. A good metric will be defined as being logical, meaningful, simple to express, understandable, repeatedly and quickly derivable, unambiguously defined, and derivable from economically collectible data. In addition, a good metric will indicate trends, suggest corrective actions, and numerically describe the progress towards the objective.

While it is important to be able to identify a good metric, it is also important to know what is not a metric. Metrics is not charts, schedules, goals, objectives, strategies, guiding principles, counts of activity, single-point statistics, or rankings. Also, tracking a process is not necessarily the same as tracking the metric. In spite of the complexity of these issues the acquisition decision-making process uses metrics throughout their deliberations.

While a set of metrics often does not allow us to draw solid conclusions, the comparative metric could still benefit the acquisition decision-making process by indicating process variation that causes unsatisfactory decisions being made. Thus, linkage between metrics of unpredictable performance; additional reviews, and inspections; avoidable rework and/or scrap; schedule delays; lower productivity; lower reliability; higher costs; and customer dissatisfaction could serve as indicators of decision-making variations that are counterproductive to a preferred decision-making

process. However, such, linkage can be established with reasonable confidence only if data from repeatable processes are available.

Repeatable processes, highly desirable for drawing statistical inferences, are usually unavailable for a weapon system acquisition decision. An acquisition decision is, in most cases, a unique event. The challenge is to define metrics that reflects how the decision-making process is accomplishing its mission while the weapon system is in the decision-making process. From that evaluation, then extrapolate these results to the entire process for use in current and future acquisition decisions (Johnson, 1998). This leap to future decisions is a big leap of faith to determine insights into the decision-making process (Pinney, 1998).

Having outlined the procedures for defining meaningful metrics for the acquisition decision-making process, it still does not provide a prescription for the generation of metrics. For some processes, useful metrics readily comes to mind, for others one must employ substantial insight and creativity to create useful metrics.

Because directly computable metrics tend to be limited in scope and specific in nature, it is necessary to know how to combine the various metrics into one macro sense picture of the decision-making process. A more prudent approach to this methodology is to accomplish this feat by the application of a quality function. In this process, do not actually combine the metrics, but rather gauge the relative contribution of each metric to the other metrics. This seems to be a more prudent path to follow, because past efforts to combine metrics numerically have often failed (Elam et al., 1980).

The subjective quality function evaluation offers interesting opportunities for linking metrics. The ranking of the metrics in this quality function deployment process

allows one to select the relatively important metrics. This prioritization could lead to more efficient strategies for assessing the acquisition decision-making process. Definition of a metric is the beginning of process of continual refinement for measuring process outcomes. As data for a metric are collected and the metric is used, much is learned that could shape an even better metric to be applied in this methodology. Efforts to define useful metrics for acquisition decision making must focus on measures that give insights into reform efforts, not specific acquisition program indicators.

Factor Five: Congressional Guidance Upon Defense Acquisition Decision Making

Congressional guidance is illustrated by the amount of funding and any congressional language that addresses specific weapon system procurement when congress establishes the annual defense budget. Within the structure of the federal institutions, the ability of the government to develop and implement foreign and military policy is divided among several agencies. While the President is usually in a position to propose, through the assistance of the State and Defense Departments, the Congress is often in a technical position to dispose such policy (Hartman & Wendzel, 1994). The struggle over the role of each branch of government in shaping foreign policy typically focuses on two broad issues: conflict over policy formulation and conflict over decisions made in the acquisition process. The impact of this arrangement is that Congress may not approve what is decided at the DoD; hence, to implement some acquisition decisions, the DoD may require additional approval and funding from Congress (Kegley & Wittkopf, 1991).

The President's constitutional powers are formidable. He manages day-to-day relations with foreign governments, he appoints ambassadors and other emissaries, he receives other nation's representatives, and he negotiates treaties and other agreements (Davidson & Oleszek, 2001). After duly concluded and ratified, treaties are the laws of the land, but the Senate does not necessarily accept all treaties signed by the President. Because treaties are difficult to ratify, requiring a two-thirds vote of the Senate, Presidents tend to use executive agreements to reach political accords with other nations (Hartman & Wendzel, 1994). Although not mentioned in the Constitution, such executive agreements have been used six times as often as treaties (White, 1980). But the President does not possess the Constitutional power to raise and support the military, that is a congressional power. The President is somewhat limited in his ability to establish the DoD budget. For example the 2001 DoD budget passed by Congress is $287.8 billion, $5.1 billion more than requested by the DoD or the White House (Holmes, 2000). This limitation of power is illustrated in the following quote:

> After considering rejecting it, President Clinton will sign the $268 billion Pentagon spending bill rather than face a risky effort to persuade Democrats in Congress to sustain a veto, his spokesman said today. Whit House press secretary Joe Lockhart said Clinton still has concerns about the amount of special-interest spending included in the bill, but that he considers the measure's military pay raise a priority. Overall, the president is the one who stood for increasing the defense budget and it's very important that we meet our commitments to our national security and our service members at home and around the world, Lockhart said. (Washington (AP), 1999)

Congress has a sizable arsenal of explicit constitutional duties, such as the power to declare war, regulate foreign commerce, and raise and support military forces (Davidson & Oleszek, 2001). The President's explicit international powers are to serve as Commander-In-Chief, to negotiate treaties, and to appoint ambassadors. Presidents have

claimed not only these powers but also others not specifically spelled out in the Constitution. Whether they are called implied, inherent, or emergency powers, presidents have used them to conduct foreign policy, in part, because of the innate power of the office (Hartman & Wendzel, 1994). As John Jay wrote, "The unity of the office, its superior information sources, and its capacity for secrecy and dispatch gave the presidents daily charge of foreign intercourse" (Rossiter, 1961, p. 137). Moreover, Congress at that time was not in session the whole year, whereas the president was available to make these decisions.

The president's advantages are especially marked in times of warfare and crisis. The legislature's inability to manage affairs during the Revolutionary War led the Founders to champion an independent, energetic executive and to centralize power and authority; presidential powers thus have been at their zenith during armed conflict (Sammet & Green, 1990). When hostilities ceased, presidential powers tended to dissipate, until the mid-20th century; that is, after World War II, the power pendulum swung quickly away from the White House, but the so called "Cold War" between the United States and the Soviet Union and the "hot war" in Korea quickly broke that trend in swinging the policy towards the legislative branch (Davidson & Oleszek, 2001). Ever since, presidents pursued their role as Commander-In-Chief, buttressed by the nation's place as a world leader and a large military unprecedented for a period of no declared wars (Kegley & Wittkopf, 1991).

Military strategy building. Given the underlying need to protect the nation's interest, the decision-makers face the job of designing military strategies towards other

nations. The following are examples of military strategic policies: determining the spending levels for defense programs, establishing specific military force levels, selecting appropriate weapon systems, choosing how to conduct arms sales to foreign powers, and the allocation of military aid to other nations (Davidson & Oleszek, 2001).

Strategic policies embrace most of what are commonly thought of as major foreign policy questions; they emerge not only as top-level executive decision makers, but also congressional committees and middle-level executive officers. The State Department is a key agency for strategic decision making, as is the Office of the Secretary of Defense (Policy) and the President's National Security Council and staff. Strategic issues are generally accorded less public and media attention than are the crisis situations (Lord, 1988). The President demonstrates leadership on strategic issues frequently by addressing the issues of national security (Thibault, 1984).

The power of the control of the federal government's funding, as specified in the Constitution, gives Congress the leverage to establish spending levels for foreign and military purposes. Within these overall figures, priorities must be assigned among military services; among the various weapon systems in the acquisition decision-making process; between uniformed personnel and military hardware; and on economic, cultural or military aid, to name just a few of their myriad of choices. The president can exert leadership by presenting an annual budget, lobbying for the administration's priorities, and by threatening to veto options deemed unacceptable. Yet Congress is equipped to prepare its own budgets down to the smallest detail. And the omnibus character of appropriations measures places pressure on presidents to accede to the outcome of the legislative bargaining on expenditures. The spirit of this legislative bargaining is captured

in the following quote: "To get the 95% solution of the budget he needs, the president may have to swallow the 5 percent of the "pork" factor that he opposes" (Davidson & Osleck, 2001, p. 400).

National defense consumes a relatively large portion of the federal outlays, while funding for international affairs represent a relatively small expenditure. The notable exception occurred in the immediate post-World War II years, 1947-1951 (Weidenbaum, 1992), when programs to rebuild devastated Europe and Japan consumed up to 17% of annual spending (DeLong & Eichengreen, 1993). In recent years, spending, for Department of State operations, the diplomatic service, and foreign aid represented only 2% of all expenditures (Davidson & Oleszek, 2001).

More significant in dollar terms is the shift between defense and "all other" spending--roughly speaking the clash between "guns and butter" (Sammet & Green, 1990, p. 43). The year of 1940 is an instructive place to start because this was a typical "peacetime" year. Of the total budget of $9.5 billion, $4 out of every $5 went for domestic programs. The next year, 1941, the United States plunged into a two-ocean war against Japan in the Pacific and the German-Italian axis in Europe. Federal spending soared to unprecedented heights: in the peak year of 1945, the federal budget stood at nearly $93 billion, 10 times the figure of 5 years earlier. Nine out of 10 of those dollars went for the war effort (Davidson & Oleszek, 2001).

At the end of World War II, Congress was quick to heed the public demand for demobilization and peacetime status. Three years after the end of the war, less than one-third went to national defense. Military spending rose somewhat during the Korean War period (1950-1953) and then subsided, although at a higher level than ever before

(DeLong & Eichengreen, 1993). Presidents Lyndon Johnson and Richard Nixon were able to conduct the Vietnam War with less than half the nation's expenditures. Since then, the ratio of domestic spending to defense spending has been approximately three to one, even though President Reagan was able to hike defense spending in the mid-1980s by three or four spending points (Davidson & Oleszek, 2001). Congress reacted to public sentiment for the higher defense spending in the early 1980s and then Congress responded to the public clamber for lower spending by passing the 1986 Gram-Rudman-Hollings Act, which limited DoD spending (Lynch, 1995).

In the final analysis, no major military enterprise can be sustained unless Congress provides the money and support. This is illustrated by the following quote:

> For a decade, The US defense budget and the cost of actually running the military have been out of whack. The situation is getting critical. New helicopters and fighters are moving from research and development to production. They will cost $400 billion. The Pentagon can live within its budget--if Congress can muster the will to slash unnecessary programs and chops manpower. In mid-October, it took a small but vital step by postponing full funding for Lockheed Martin's F-22 Raptor fighter. But lawmakers showed they can still play games by reverting to accounting chicanery--reclassifying some operations and maintenance funding as emergency spending--and putting off hard decisions on which programs to scrap. (Cook, 1999, p. 25)

Presidents may be able to conduct operations for a time using existing funds and/or supplies already placed at their disposal (for example, already authorized and appropriated funding), as Lyndon Johnson did during the Vietnam conflict, but sooner or later they must ask Congress for additional funding (Wildavsky, 1992).

Factor Six: The Increased Use of High Technology in Today's Defense Weapons Smart Weapons

High technology was always part of the weapons used in the history of warfare; for example, the English "long bow" was considered a "high-technology" weapon in its day during medieval times. Today's so-called "smart" weapons were first used in Vietnam and a few visionary individuals recognized their true significance only temporarily and then only in a limited role during battle scenarios (McNaugher, 1989). There was no thought to the necessary changes that these smart weapons would have to the general conduct of war and certainly no thought to the impact upon the defense acquisition decision-making process (Neufeld, Watson, & Chenoweth, 1997). These first "smart" weapons used in Vietnam were laser-guided bombs: a laser beam within the bomb itself illuminated their targets and through electronics that honed in on the reflected laser beam the weapon struck the target (Hallion, 1997). The Air Force was the only service possessing these primitive "smart" weapons, which, with some assistance, would look for a target rather than fall where they may, relying on gravity, winds, and chance to actually strike the intended target (Brown, 1983).

High technology weapons have always been a significant part of the American weapon inventory (Binkin, 1986). The first tests of the airplane as an instrument of war were so successful that the airplane-delivered bomb soon made its debut in World War I and is described as follows:

> For the first time in the history of aviation actual bomb droppings from an aeroplane took place at College Park yesterday. Lieutenant Thomas De Witte Milling, operating an Army biplane, took up former Lieutenant Scott, inventor of the bomb-carrying device, and on two successive trips released a 25-pound steel shell from the chassis of the aeroplane while the machine was flying at 41 miles per hour. The first was carried to a height of 500 feet and aimed at a 30-foot circle

> on the ground. It fell only 10 feet away from its mark, and imbedded itself so deep that soldiers had to dig it out of the ground. The second attempt the marksmanship was better than the first trail, though the bomb was broken (Washington Post, 1911, p. 1)

At the turn of the 1960s, the Army became interested in "smart" weapons and embarked on the development of a guided projectile for its 155mm-howitzer weapon system. An extended development period followed, extended because of the requirements for its homing electronics in the nose of the shell to withstand the "G-load" imposed when the shell is fired. The Air Force weapons, which are launched in a much "kindlier" ambient environment, are not subjected to these same "G-load" forces, thus simplifying the design of these weapons and making their acquisition research and development a much easier process (Binkin, 1986).

Concurrent with the development of the guided projectile, the Army also developed a guided missile to be used from its attack helicopter called HELLFIRE. It too was a laser guided "smart" weapon. However, because the helicopter was also equipped with a device called TADS/PNVS (Target Acquisition Designation System/Pilot's Night Vision System), the pilot and gunner could also see at night as well as during the daylight (Binkin, 1986). Therefore, targets could also be designated at night--this marked the transition for military operations to more completely use the cloak of darkness as part of their military utility (Binkin).

The military action in Panama in December 1989 marked the initial use of the very highly technical F-117, "Stealth fighter" (McFarland, 1997). This weapon system was used to deliver, at night, precision-guided weapons to a "highly defended" target

area, as the country of Panama had to offer at the time. The F-117 was used due to its ability to precisely deliver bombs (Sammet & Green, 1990).

From a political side argument, there was much discussion about the price of acquiring these "smart"--high technology weapons. Therefore, the use of the F-117 in a relatively threatening "wartime" environment such as during the "Desert Storm" conflict was considered as a possible justification for spending the billions of dollars in the defense acquisition process (McFarland, 1997).

"Smart" weapons are not the final conclusion of technology's promises (Weidenbaum, 1992). The next generation of weapons will be "brilliant" weapons, weapons that need no external guiding forces but which, when launched, will seek out and home in unaided on targets on the battlefield (Cohen, 1997a). Advanced electronics, the ability to harden electronics, and the ability to package a tremendous amount of electronics in a very small package are all contributing to these developments, all of which are already underway (Binkin, 1986). Another example is the high technology weapons for Army infantry soldiers:

> The heart of the integrated Land Warrior system is a small wearable, computer-radio subsystem, mounted on the soldier's lower back. The computer is connected to a thermal Weapon Sight atop his rifle. The computer is also linked to a combined laser rangefinder digital compass and a video TV sight (Goodman, 1999)

This example of the use of high technology for DoD personnel is congruent with the comments made by Army Secretary Louis Caldera on October 7, 1999. Caldera stated," Responding to criticism that it has not adapted to the post-Cold war era, the Army will unveil a new battle plan that emphasizes lighter fighting units and a rapid development of a new generation of armored vehicles" (Suro & Graham, 1999, p. A-19).

General Henry Shelton, Chairman of the Joint Chiefs of Staff, explained at this same meeting, "We cannot defeat tomorrow's enemies with yesterday's weapon; we can't win tomorrow's wars with yesterday's ideas" (Suro & Graham, 1999, p. A-19).

Technology is not completely out of control, in the technological determined sense, but neither is it very much under control. There are powerful vested interests, both commercial and militarily, involved in the development and acquisition of weapon technology. Institutional and economic interests continuously push very strongly towards "follow-on" weapon systems, as does explicit governmental policy aimed at maintaining work for the many actors in the acquisition community that this chapter has examined. As technology offers the DoD "improved" weapons there are many issues outside of the military utility of such weapons that needs to be addressed. And these discussions have direct bearing to the defense acquisition decision-making process.

> Ten years after the Cold War ended, the US military's arsenal of weaponry remains dominated by big-ticket weapons such as tanks, aircraft carriers and fighter jets--hardware that would have been especially useful if the standoff with the Soviets had ever turned hot. Today, this arsenal siphons spending from innovative equipment that many inside and outside the defense establishment say America must invest in to retain its military edge as the nature of modern warfare evolves. Among other types of equipment, experts point to UAVs (uninhabited airborne vehicles) and the so-called arsenal ship--a mobile launch pad with a small crew and all manners of missiles--as prime examples of equipment that is as high in potential as it is low in priority. The real problem with the Defense Department isn't fiscal, it's strategic, says Andrew Krepinevich of the nonprofit center for Strategic and Budgetary Assessments in Washington. It's not that they don't have enough money; it is how they spend the money they have. (Ricks & Squeo, 1999, p. 1)

For 150 years, the makers of dumb munitions have survived when the associated warfare was massive and damage to adjacent buildings was accepted as part of the

turmoil of war fighting. Although still instruments of death, these advanced weapons can change the conduct of war and influence the acquisition decision-making process.

In this chapter, we have looked at the influences on the defense acquisition decision-making process. Specific influences examined in the chapter were the federal budget and in particular the DoD portion therein, the changing mission for the military, the actors within the decision process, the metrics used to measure the perceived success of an acquisition program as it passes through the milestone process, the impact of congressional funding and language on program development and finally the impact of the increased use of today's high technology into current and future weapon systems. With this foundation, the next chapter will illustrate with three case studies how these influences were evident in the decision-making process during the acquisition of three major weapon systems.

CHAPTER 5

THREE CASE STUDIES

This chapter illustrates specific examples of decision-making theories previously discussed in Chapter 2, literature review, by examining three specific DoD case studies that demonstrate the complexity of the DoD acquisition decision-making process. Specifically, this chapter focuses on how decisions were made during the acquisition of three major weapon systems. These three major weapon system programs were selected for case study for three reasons. The first reason was because these case studies fulfill necessary characteristics that enable students of public administration to compare and contrast the defense acquisition decision-making process to published decision-making theories. The second reason was that each acquisition program has adequate published material available from which a detailed case study of the decision process can be made. The third reason was that each case study examines a weapon system from one of the three armed services; therefore, the argument cannot be made that the decision process examined is unique to a specific military service. Additionally, through this effort of studying the theory of decision making relative to these three case studies presents insights on how to improve the DoD acquisition decision-making process.

The first case study discussed is the Air Force's B-2 bomber program. This case study reveals that without open discussion from all parties involved in the decision process that the process becomes flawed and results in bad decision making.

The second case study is the Navy Trident ballistic missile submarine. The case study identifies when a decision process is dominated by several strong personalities at the expense of performing the decision process as designed, with the result being that the process becomes stifled and bad decisions are made. The third case study highlights the complexity of the acquisition process and shows how the Army Multiple Launch Rocket System successfully demonstrates many academic decision-making theories.

Case Study 1: B-2 Stealth Bomber

Introduction

The B-2 bomber was originally conceived to be the next generation strategic bomber and remains in this post-Cold War era as an effective means for time-urgent military power projection. As a result of breakthroughs in stealth, information warfare, and precision-weaponry technologies, the B-2 aircraft gives the United States a major weapon system with a bomb payload capable of destroying numerous targets during a single sortie (Perry, Pfaltzgraff, & Conway, 1995).

Why Was the B-2 Needed?

The B-2 program was shrouded in secrecy from the program's beginning in the late 1970s (Scott, 1991). The United States military strategy of nuclear deterrence was based on the concept of a viable TRIAD of strategic nuclear delivery systems. These TRIAD nuclear delivery systems were air-, land- and sea-based. The air segment of this TRIAD was designated as the manned bomber.

Since the 1950s, the B-52 has been the premier strategic bomber for the United States; however, since the defense acquisition process takes so many years, the planning for a replacement bomber had to begin many years before it was needed. The B-1 aircraft was designated to be the replacement bomber for the B-52; however, the B-1 was unable to fulfil the nuclear bomber mission for the U.S. hence the need again arose to find a suitable replacement bomber for the B-52. The DoD decided to continue the production of B-1 bombers for political reasons even though it was decided that it was not the replacement bomber for the B-52. The B-1 was not able to be the replacement bomber because it failed to satisfy near term military strategies of providing a bomber aircraft capable of penetrating enemy defenses. The implications from this decision to continue to buy ineffective B-1s, while making super sophisticated and expensive B-2s, complicated the entire DoD decision-making process and also illustrates the academic theory of "satisficing" described by Herbert Simon (1976).

B-1 Evolution, or the Bomber That Never Was

The gestation period for the B-1 was many years. This proposed new bomber was given many different names during its evolution and these name changes indicated many changes in its proposed mission. For example, in 1961 the new bomber was originally called the Subsonic Low Altitude Bomber and its mission was to fly extremely slow and at a very low altitude to its assigned targets. However, its name was changed to the Extended Range Strike Aircraft in 1963 when its mission was changed to long distance bombing missions with the removal of the low altitude flying profile. In 1965, its name and mission changed again when it became known as the Advanced Manned Precision

Strategic Aircraft and its mission was to standoff away from its targets and launch precision guided missiles at its targets (Atkinson, 1989). These constant changes in the aircraft mission highlight the need as expressed in the academic theory espoused by Mary Parker Follett for a constant and complete communication with all parties involved in the decision-making process.

Concurrent with these discussions as to what the new bomber should be named, some military planners considered intercontinental missiles to have rendered the need for any manned bombers to become obsolete, thereby complicating the debate for a need of a "new bomber" (Brown, 1983). However, in June 1970 Congress did approve the acquisition of the new bomber and North American Rockwell was to be the prime contractor. This new bomber directed by Congress was called the B-1A (Binkin, 1986). The ability of Congress to intervene in these ongoing administration decisions and direct the federal government to build a specific new bomber illustrates what Frank Goodnow (1900) wrote in *Politics and Administration.* Goodnow wrote in this article that politics deal with development of policies or expressions of the state "will," and administration (DoD) has the task of the execution of such policies. Goodnow stated that without an effective distinction between politics and administration, a lack of harmony between the law and its execution results in a political paralysis or "gridlock."

The usefulness of the manned bomber continued to be debated and nay-saying strategists also felt that bombers in general, and specifically the B-1, would not be able to penetrate the heavily defended target areas (Brown, 1983). This bomber vulnerability question eventually prevailed and, in June 1977, President Carter terminated the B-1A bomber program in order to explore other alternatives to nuclear weapon delivery (Kegley

& Wittkopf, 1991). This decision by Carter illustrates how the DoD acquisition process exists in an open environment and is influenced by many external variables.

Alternatives to spending additional DoD dollars on a new bomber were investigating several innovative approaches to securing national defense. Among those approaches was the concept of using numerous cruise missiles launched from a "mother ship" that remained safely many hundreds of miles off from enemy territory (Hallion, 1997). Another alternative was to support the national deterrent strategy totally with land based missiles launched from the United States (Barnaby & Huisken, 1975). Other alternatives included the increase use of arms control and diplomacy as the prudent means to combat a potential enemy (Brown, 1983).

While the respective merits of these several alternatives were being openly debated in Congress, work was initiated by the DoD in great secrecy on yet another strategic bomber aircraft. This new bomber relied on new "low observable" technical developments to reach its intended targets as a means to render the argument of bomber vulnerability moot (GAO/NSIAD-95-164, 1995b). This illustrates the claim that the DoD used a select and limited number of trusted agents--an argument espoused by Richard Stillman to arrive at key decisions. This use of a small group of decision makers, who made decisions in secret, led later in the program to severe criticism of the B-2 bomber program from both the Congress and the media.

This new bomber program was funded as a *special access program* (SAP) or colloquially known as a "black program." A black program is one where its expenditures of funds are not revealed in the open press (Wildavsky, 1992). This new bomber program, called the Advanced Technology Bomber (ATB), was initiated in 1978 (Gourlay, 1971).

This bomber became a symbol of difficult decisions facing the nation at a time of colossal budget deficits and a diminishing military threat from its past main antagonist, the Soviet Union. The B-2 proponents argued that the acquisition of this bomber would guarantee a reliable military deterrence well into the 21st century. To the critics of this program, the $70 billion dollar price tag (GAO/NSIAD-90-120, 1990a) threatened to bankrupt the Pentagon without significantly bolstering the nation's military arsenal (Atkinson, 1988). Congress could not agree on the need for the bomber, underscoring a lack of national consensus on how much U.S. military strength was really needed (Synar, Betts, Kaufman, Dougherty, DeLauer, & Quayle, 1986).

The B-2 program was undertaken with virtually no public debate; the aircraft cost, mission, and technology were treated as state secrets (Atkinson, 1989), and this lack of public debate led some congressional and media personnel to distrust DoD on this acquisition program. This need for public debate during periods of decision making is an example of public administration theory heralded by Robert Denhardt. He wrote that the government is very large and complex; and because of this reality, a discussion of accountability is necessary. He stated that there must be agreement between the decisions of bureaucrats (DoD) and the preference of the people (congress) and that this can be accomplished in two ways, with the professionalism of sticking with the approved decision-making process coupled with constant oversight from those accountable for those decisions.

Why a B-2 "Stealth" Bomber Was Needed

With the proliferation of military radar system, since World War II, adversaries have desperately sought effective countermeasures (Adelman & Augustine, 1990). The Defense Advanced Research and Production Agency (DARPA) provided funding to several American contractors to focus their research for countermeasures into this emerging radar technology (Hallion, 1997). William Perry decided to quickly investigate this emerging low observable technology because he knew that the defense acquisition decision-making process took over 10 years for a major weapon system to proceed from the research phase to the ultimate deployment of a new piece of military equipment.

> Regardless of its political roots, the Advanced Technology Bomber concept was given life--and official go-ahead--during the Carter years. That decision unleashed a secret technology development effort unlike any since the heady days of the Manhattan project during World War II. (Scott, 1991, p. 3)

On August 22, 1980, stealth technology became public because of political pressure. Against objections from the Air Force, Defense Secretary Harold Brown announced that the U.S. was developing a new military technology, which would significantly alter the military balance (Atkinson, 1989). This disclosure of the existence of stealth technology came in part because only a very few members of Congress knew about the stealth technology, and the Carter administration had agreed to brief a wider audience after the technology program eclipsed the $1 billion threshold (Synar et al., 1986). The political gain from this announcement was that congressional Democrats who had been criticized in the past for opposing the B-1A, could now say they had a new strategic weapon that they supported. The B-2 became the Democratic Party bomber, while the B-1A remained the Republican Party bomber (Aviation Week and Space

Technology, 1988). Again, this highlights the possible ramifications written about by Woodrow Wilson of having politics as part of the bureaucratic decision-making process.

Cost Concerns Exposed

Work undertaken in the "black world" required an inherent need for added secrecy, which added significant cost to this major acquisition program (Synar, et al., 1986). GAO estimates that security for "black world" program management accounted for 3% of the bomber program (GAO/NSIAD-95-164, 1995b).

In 1988, the Air Force forecasted future B-2 production costs would exceed $70 billion for the total program and would exceed $8 billion a year each year during the early 1990s (GAO/NSIAD-95-164, 1995b). This was new information for the House Armed Services Committee Chairman Aspin (Atkinson, 1989), who noted that only a dozen nations in the world had entire defense budgets greater than the projected $8 billion a year (GAO/NSIAD-90-120, 1990a). Aspin stated that if the U.S. went ahead with this program it would spend more annually on this one military system than any Warsaw Pact country, save East Germany and the Soviet Union, would spend on its entire military budget (Atkinson, 1989).

With the demise of the Soviet Union in 1991, the military threat to America as rationale for the B-2 bomber program used by the DoD seemed to evaporate (Gansler, 1989). The defense acquisition process was unable to react fast enough to this decrease in military threat to the U.S., so the decision-making process continued to articulate an out-dated need for the bomber, while external events dictated otherwise. This illustrates the writings of John Gaus, as he wrote about how an open environment affects all elements

within the system--thus, the defense acquisition decision-making process as an open system is affected by a myriad of influences external to its own organizational structure and processes.

It was at this junction in the acquisition decision-making process that the first serious critic inside the Pentagon appeared on the scene. Robert B. Costello was appointed to the new post of Under Secretary of Defense (Acquisition; USD/A) after he had a successful career as a General Motors executive (Kapstein, 1993). He had oversight of the DoD's approximately $90 billion in annual purchasing budget (Gansler, 1989). In August of 1987, he spent several days inspecting the B-2 program at its various locations and when he returned to the Pentagon, this senior defense acquisition decision maker was worried about decisions made concerning the B-2 program (Atkinson, 1989).

Specifically, Costello wondered whether the Air Force had been a sufficiently tough taskmaster in stressing the necessary quality and cost controls of this program. However, by his comments he was assessing the entire defense acquisition decision-making process (Atkinson, 1989). After his careful review of this program, he became convinced that the B-2 mission could be preformed equally as well with other less expensive weapons. Therefore, Costello brought up previous discussions from the Carter administration by exploring whether inexpensive cruise missiles could be a suitable alternative weapon system (Barnaby & Huisken, 1975). This development of a renewed dialogue within senior DoD decision makers of the need for the new bomber illustrates a theme found in the writings of Anthony Downs (1994), *Inside Bureaucracy*. Downs writes of the stages of bureaucratic growth and Costello, as the first USD/A, explored questions that had not been asked beforehand. Specifically, Downs writes that as

bureaucracies grow older they change in predictable ways; they perform tasks better with experience, and they develop more formalized rule systems.

The B-2 prime contractor, Northrop Grumman, a defense firm with 50 years of experience in decision process was focused on the means to finish the production of first B-2 aircraft (Air Vehicle 1), get it airborne, and then attempt to solve other problems in the program. Northrop was convinced that public approval for the B-2 program would be assured after the media showed pictures of this innovative aircraft flying and concluded that this public approval would support the program through any difficult times ahead. This type of decision making is an example of the subject matter in Irving Janus's (1982) writing on *Groupthink.* Northrop would have been well served if they had discussions as to possible other alternative public reaction to the program. Janus would argue that when the decisions are made that alternatives to their preferred decisions should be discussed and that the arguments voiced by opponents to their thinking be considered.

Because Northrop's designs were using its new and unique three-dimensional computer-assisted design and manufacturing system, Northrop program managers felt confident enough to skip the usual initial step of building master tools for a bomber prototype. Instead, Air Vehicle 1 was designed to be a full operational plane built with the same hard tooling to be used on the rest of the fleet (GAO/NSIAD-96-192, 1996a). As a result, Northrop believed that it could reduce the number of construction man-hours necessary to build this aircraft from the 1.5 million hours on the first bomber aircraft to under 1 million man-hours on the third jet in production construction (GAO/NSIAD-90-120, 1990a). However, this steep learning curve did not develop as hoped for.

Consequently, manufacturing gremlins in Air Vehicle One caused 6 months of delay in getting the aircraft airborne and added to total program costs (Scott, 1991).

To garner political support for the program, Northrop urged the Air Force decision makers to veer away from stating that the B-2 had only a nuclear war mission (Payne & Kohout, 1995). Northrop suggested to the military that the use of this aircraft was similar to all other bombers--a mere "truck" to haul massive loads of bombs to target areas (Atkinson, 1989). Manufacturing work continued on Air Vehicles Two through Five. Air Vehicle One flew for the first time on July 17, 1989 (Gourlay, 1971) and this flight initiated the formal flight test period. This flight test program was scheduled to accomplish over 3,500 flight hours, a flight test scenario never attempted before in any previous test program (GAO/NSIAD-95-164, 1995b). This detailed flight test program illustrates the ideals published by Max Weber (1978), who wrote on the importance of a bureaucratic system of administration. The Air Force flight test profile was extremely iterative; each attempt of a new flight activity was based on previous flight activity. Similarly, Weber breaks down bureaucratic organizations into tasks to be divided into functionally distinct areas, each with requisite authority and responsibility.

Congressional Concern

Congressional oversight of the B-2 bomber had been limited to few people for the first six years of this defense acquisition program (Payne & Kohout, 1995. In the late 1970s, only the chairmen and the ranking minority member of the four defense oversight committees, the House and Senate Armed Services, and House and Senate

Appropriations committees, were briefed on the stealth bomber. In the early 1980s, the full committees were then briefed on this acquisition program (Atkinson, 1989).

There was an explosive growth of defense spending in the early 1980s and a dramatic rise in the number of "black world" programs (Hallion, 1997). It was the stated intent of DoD to provide adequate and complete information to Congress and staffers who required the information to conduct their duty. DoD provided the following guidance for program managers when dealing with Congress in regards to security:

> Members and staffs are authorized access to classified and unclassified information when necessary to perform governmental functions. Members have clearances for classified matter by virtue of their election to Congress but the level of clearance is left open. Staff clearances are processed by the office of Secretary of Defense for Legislative Affairs and go through the same background investigations as do DoD personnel (Jones, 1992, p. 48)

It is interesting to note that some members of Congress did not understand the dilemma of granting elected members and staffers special access into these highly classified defense programs. For example, Congressman Mike Synar stated,

> Members of Congress must vote on the B-2 bomber program; we have an obligation to know the raw numbers we are approving. I am aware of the possibility that there may be members of Congress who cannot be trusted. But this is an internal matter for the House of Representatives not appointees in the Pentagon to decide (Synar, et al., 1986, p. 2)

The GAO began looking at the stealth bomber program in 1984 under extremely high security restrictions (Atkinson, 1989). In 1985, the new chairman of the House Armed Services Committee (HASC), Representative Les Aspin, asked his staff to take a closer look at this defense acquisition program and the decision-making process that had enabled this bomber program to proceed for so long with little congressional insight. Two staffers made nine visits to Northrop's California plant; they warned the full HASC that

stealth technology was an evolving program with many unresolved cost, schedule, and technical problems (Synar et al., 1986).

Northrop's confidence in the program was undiminished. At Pico Rivera and in corporate headquarters in Culver City, California, company executives believed the company was proving itself to those skeptics who considered Northrop too small and inexperienced a company to manage a massive defense acquisition program (Kapstein, 1993). Success on this bomber program could lead to other "stealth" related contracts because the DoD was using "stealth" technology as the means to infuse high technology into future military weapons; however, "stealth" technology is expensive.

In June 1986, the Pentagon announced that 132 B-2 bombers would cost $36.6 billion, which made it the most expensive defense acquisition decision (GAO/NSIAD-90-120, 1990a). It became now clear to Congress and the American public how much Northrop and its subcontractors had to gain financially from this program. The future looked fiscally very bright for all companies in this project and for the aerospace industry in general (Gansler, 1989).

In December 1988, Air Force Secretary Edward Aldridge announced that the B-2 cost had risen from the previously announced $36.6 to $42.5 billion in 1981 static dollars, roughly a 20% increase (GAO/NSIAD-90-120, 1990a). But in terms of the actual dollars that would be spent on the 132 bombers by the late 1990s, including the estimated effect of inflation, the B-2 defense acquisition program was estimated to cost $70 billion for a fleet of 132 bombers (GAO/NSIAD-90-120).

During 1989 to 1990, again intense political battles were fought over the issue of why the country needed the B-2 bomber. The Air Force countered the debate for a new

bomber with yet another new evolving role for the bomber, that as a destroyer of mobile targets (Perry et al., 1995). According to Defense Intelligence Agency estimates, half of the Soviet land-based Intercontinental Ballistic Missiles (ICBMs) could evolve into mobile systems by the mid-1990s (Atkinson, 1989). However, even this last gasp of assigning an evolving mission for the B-2 as a means to support acquiring the full complement of these expensive bombers evaporated when the Berlin Wall fell with the demise of the Soviet Union. Consequently, with the lack of a compelling reason to buy these bombers and without strong congressional demand to purchase the bomber, the Air Force made the decision to buy only the 21 bombers. These 21 bombers were in the production phase of the decision-making process and were almost already completely assembled aircraft.

Thus, with that decision ended the up-to-then-most expensive acquisition program in the history of the Air Force--a program that was originally to procure 132 bombers at a cost of $70 billion for nuclear deterrence was trimmed to 21 bombers at a cost of $42 billion. This case study illustrates the need for open discussion throughout the decision-making process. The purchase of the B-2 bomber is an expensive example of bad decision making. Under the cloak of national security, this Air Force acquisition program was allowed to invest tens of millions of dollars into a weapon system that was simply not necessary. While the value of the military utility of the B-2 bomber is outside the scope of this paper, this author states that decision-making theories expressed in Chapter 2 highlight the need for serious, honest, and continuous debate while issues remain in the decision-making process. This author concludes that the necessary open debate of the issues did not occur in this program, hence, when the cost became public and the military

environment changed then there was no congressional or public support to continue the program, with the result that the program was terminated and approximately $42 billion of public funding was spent for 21 aircraft.

Case Study 2: Trident Submarine

Introduction

Trident submarines are a critical element in the nation's capacity to retaliate against a first nuclear strike by any enemy force. These submarines are powered by large nuclear reactors and bristling with multiple-warhead missile systems capable of striking targets thousands of miles away. Tridents are 560 feet long, 42 feet in diameter and are the largest submarine ever built by the United States (Congressional Budget Office [CBO], 1993). Trident is one of the most expensive DoD weapon systems ever acquired. The original program was to buy 24 Trident submarines at a cost of $1.7 billion per submarine (Schumacher & Zimmerman, 1988).

The Trident system is central to the nation's strategic forces and its national security. A single Trident submarine could carry around 200 nuclear warheads. Unlike the ICBM, the submarine is difficult to locate once they are on patrol. This difficulty of bringing them under attack has more than compensated for their high cost (Woolsey, 1984). Today's Trident submarine acquisition program is not the program that was originally envisioned in the early 1970s as plans for a new generation of strategic missile submarines were first being developed. Those initial plans by the DoD included an original concept of a quiet slow-moving submarine of modestly enhanced capabilities. That DoD acquisition was to serve merely as a platform for a new missile with more than

double the range capability of its immediate predecessor, the Poseidon missile (Holland, 1997). During the decision process, from the original sketchy plans to initial deployment nearly 20 years later, the Trident submarine was shaped by a series of decisions made by several DoD decision-makers with different and sometimes conflicting objectives. The most influential of these decision makers was Admiral Rickover, and this case study demonstrates the power that a few individuals maintained over the entire decision-making process.

The DoD acquisition decision-making executives initially wanted the Trident to be a cost-effective missile-launching platform. The White House saw the Trident submarine program as a bargaining chip to use in arms-control debates with the Soviet Union (Ackley, 1990). The Navy envisioned an urgent need for a dramatically larger fleet of affordable submarines to augment their 600-ship fleet (Dalgleish & Schweikart, 1984); however, Admiral Rickover, known as the Father of the United State's nuclear Navy, insisted on a high-speed submarine powered by a newly designed nuclear reactor. The submarine that was ultimately constructed was Rickover's submarine design, even above the arguments of individuals in seemingly more responsible positions within the formal decision process (Spinardi, 1994).

Early Program Decisions

The decision-making process for the Trident program began in 1966, when Secretary of Defense Robert McNamara directed the Institute of Defense Analysis (IDA) to assemble a panel of defense experts, named STRAT-X, to study the long-term and most cost-effective methodology of accomplishing U.S. strategic nuclear military needs

(Schumacher & Zimmerman, 1988). This approach by McNamara, of using cost as a dominant influence in the decision-making process, was consistent with his management philosophy previously examined in the literature review chapter.

During their deliberations, STRAT-X members emphasized the acquisition issues of cost, reliability, and survivability (Schumacher & Zimmerman, 1988). The survivability of a submarine became an issue because it was estimated the future Soviet threat would be able to destroy American land-based missile silos with a first-strike capability (Medalia, 1981).

In the summer of 1967, after considering nearly 125 alternative basing modes, the IDA panel began studying four basing plans in detail: rock silo, submarine, land mobile, and ship (Schumacher & Zimmerman, 1988). With the help of the systems analysis office of the Chief of Naval Operations staff, the panel concluded that submarines provided the least costly and most survivable means of basing future U.S. deterrent forces.

In their report, STRAT-X outlined, in general terms, the details of this submarine that would launch missiles. Its design was for a boat that was slow, very quiet, and not very deep diving. The submarine's limited depth and speed capabilities were aimed at minimizing expense, while its quietness would offer maximum protection from any inadvertent detection. The new submarine would carry multiple warhead missiles with an enhanced range of about 4,000 nautical miles, (Schumacher & Zimmerman, 1988) vice the 2,500 nautical mile range of the then current Polaris and Poseidon missiles (Sapolsky, 1972). The STRAT-X panel named the new missile and its launching platform the Underwater Long-range Missile System, known as "ULMS."

The panel members did not specify a precise payload, but they did recommend that the new submarine carry "more than sixteen" missiles (GAO/NSIAD-90-160, 1990d). The current Polaris submarines carried 16 missiles. Navy acquisition decision makers thought that having more missile tubes on the new submarine was a good idea, because the Navy could then reduce the total number of submarines required to deploy an equal number of ballistic missiles.

In the interest of minimizing cost, a decision was also made to avoid extensive research and development on both the submarine and its accompanying missile. The submarine would be very large in order to accommodate the larger and longer ranged missiles; hence, the submarine would be slower moving than what was being articulated by Rickover as a critical need for this submarine. The reactor size and submarine speed became a locus of discussion throughout the decision-making process. Speed was an expensive feature because larger and hence more costly new power plants would be needed to provide the relative small increases in the desired cruise speed.

The STRAT-X panel members concluded that speed would not significantly enhance the submarine's invulnerability and opted instead for stealth characteristics designed to keep radiated noise that could be picked up by enemy passive sonar to a minimum as the ship's main defensive feature (Medalia, 1981). Equally important, from a submarine survivability point of view, the added missile range greatly increased the operating area for the submarine from the 5.5 million nautical miles afforded by the Polaris submarine to over 53 million square nautical miles for the new system. Therefore, the new system would have much more "room" in the ocean to "hide" from enemy sonar systems (Woolsey, 1984). With a planned range of its missiles in excess of 4,000 nautical

miles (CBO, 1993), the submarines would be within range of their intended targets immediately upon departing from either the East or West Coast United States bases (Navy League, 1997).

Other design features were expected to contribute to the cost-effectiveness of the system. Traditionally, submarine construction began with the construction of the hull, after which internal systems and necessary sub-systems were painstakingly installed under extremely crowded conditions, which made the entire construction phase very slow and labor intensive. The STRAT-X panel members proposed a modular method of ship construction, whereby the hull was fabricated in separate sections (Schumacher & Zimmerman, 1988). This cost-effective construction method was compatible with this submarine's 50-foot diameter, which also allowed for larger missiles and greatly increased sound insulation to be installed (Woolsey, 1984).

The Navy and Strategic Ballistic Missile Submarines

Before the age of the submarine launched ballistic missile (SLBM), which was ushered in with the arrival of the first completed Polaris submarine in 1960, submarines had been exclusively sub-surface attack boats characterized as being fast and daring. These attack boats were a rather small but deadly arsenal of torpedoes, they would "sneak" up on a target, typically another submarine or a surface ship, and deliver a surprise blow and then beat a hasty retreat out of harm's way. The Navy relished the bravado of its submarine captains and cherished the image of these movie-star-like crews. In contrast to this dashing image, the new SLBM submarines, called "boomers," with their load of big ballistic missiles, were merely large missile-launching platforms that

avoided any contact with the enemy. These boomers attempted to hide in the depths of the oceans, keeping their deadly cargo of missiles safe from attack and poised for orders to initiate a nuclear retaliation strike (CBO, 1993). This was a necessary role for the Navy. Hence, besides this lost opportunity for gaining additional glory for the Navy, senior Navy decision makers were concerned with the added burden of the added financial cost of acquiring and maintaining these "boomers." There was a concern by senior Navy decision makers that the acquisition of these ponderous submarines would reduce the funding available for other Navy assets that did bring glory to the Navy, such as surface ships, attack submarines, and aircraft.

This fear of SLBM costs adversely influencing the Navy budget had foundation as the history of the Polaris program amply illustrated. With the daunting task of having to acquire a new system, the Navy could once again feel threatened by the potential for having a large portion of its total budget be designated for this new submarine, as happened when the Polaris submarine system was being developed. The Polaris program began in 1956 and grew to absorb one-tenth of the Navy's budget (Sapolsky, 1972) between 1960 and 1967, when 41 Polaris submarines were deployed. Saplosky noted, "Polaris program allocation, as percentage of total navy appropriations during its development years of 1959 through 1964 was 8.68%; 8.96%; 14.06%; 13.41%; 11.51% and 8.67%" (p. 169).

Despite occasional signs of disaffection in the Navy, the notion of submarines as a part of the strategic deterrent force took hold among the defense analysts in OSD. The ULMS was the heir apparent to the Polaris and Poseidon acquisition programs. Given the Navy Office of Special Programs' (SP) successful execution of the Polaris program,

which was completed 3 years ahead of schedule and $450 million under budget, it was logical that SP was given responsibility for ULMS (Spinardi, 1994).

ULMS and SP: Admiral Smith

As director of the Navy Office of SP, where the submarine programs were managed, and one of the key advisors to the STRAT-X panel, Admiral Levering Smith was charged with shepherding ULMS from the study phase through the design phase of the acquisition process (Polmar & Allen, 1982). Smith had been technical director of the Polaris project (Sapolsky, 1972) and, along with Admiral William Rayburn, then the head of SP, was closely attributed with the success of that submarine program (Polmar & Allen). Through the success of the Polaris program, Smith gained a reputation on Capitol Hill for cost consciousness and conservative management (Schumacher &Zimmerman, 1988).

In the months immediately following release of the STRAT-X report, Congress authorized and appropriated $5 million for a study of the ULMS requirements (Spinardi, 1994). At the same time, some defense experts became alarmed by reports that Soviet attack submarines were being built more sophisticated than originally thought and thus becoming a clear threat to American submarines (Polmar & Allen, 1982). Alarmed by this perceived growing threat from Soviet submarines, the Congressional Armed Services Committees authorized the development of a "super-high-speed" attack submarine, known as the "688 class" which later became known as the *Los Angeles* submarine (Polmar & Allen).

Smith did not consider speed an important element in the design of "boomers," preferring to focus on improvements in stealth technology such as "quieting" (Spinardi, 1994). He therefore planned to meet the dual objective of minimizing research costs and "quieting" by using the existing reactor in the attack submarine *Narwhal* as the engine for the new submarine (Spinardi). The *Narwhal* featured a natural circulation reactor, which, at low speeds, used convection (the rising of warm water) rather than pumps to over pressurized water-coolant through the reactor core. As a result of this technique, it was quieter than the conventional forced circulation reactors. The *Narwhal* reactor delivered 17,000 shaft horsepower, just a little more than the reactors that powered the Polaris submarines (Dalgleisch & Schweikart, 1984).

Smith was pleased with the decision process thus far, but in 1970 the program ran into a significant snag. This problem took the form of Vice Admiral Hyman Rickover. Rickover was already a legend in the navy for his successful development of the Navy's nuclear powered fleet; however, Rickover was feared because of his close connections on Capitol Hill (Polmar & Allen, 1982). Like Smith, Rickover had risen to flag rank, not through the operating Navy career path that led to command of a ship, but from the ranks of the restricted line engineering duty officers. His promotion from Captain to Rear Admiral in 1953 set a pattern that characterized the rest of his Navy career. By 1952 the Navy had twice passed over Captain Rickover for promotion to Rear Admiral, which meant that, by law, he would have to retire within the year. However, a formidable group of friends and allies, including then Representative Harold "Scoop" Jackson, succeeded in lobbying the Navy to reconsider his selection to Admiral and thus Rickover finally received his promotion (Schumacher & Zimmerman, 1988).

In theory, at least so long as SP and Smith used the existing reactor, Rickover's role in the development of ULMS would be limited to providing only that reactor. On the other hand, selecting a new reactor would involve Rickover in the re-design of the entire propulsion system and therefore a re-design of the entire ship. His influence on the design of the entire ship would grow, especially in such fundamental design points as the necessary hull diameter since the reactor occupied the aft one-third of the submarine. Rickover's involvement became inevitable when SP asked the nuclear propulsion directorate for weight and dimensional data on the *Narwhal* propulsion system (Spinardi, 1994). He immediately raised strenuous objections, arguing that the new ship would need enough power to reach speeds of at least 24 knots (Spinardi). The 24 knots seems important since it is the maximum speed at which active sonar functioned effectively (Dalgleish & Schweikart, 1984). The *Narwhal* plant would not deliver the necessary shaft-speed (horsepower) to attain this required speed (Spinardi). Rickover proposed a new twin natural circulation reactor that provided a total of 60,000 shaft horsepower, or more than three times the power originally envisioned by Smith (Spinardi).

By March 1970, a compromise had emerged. The ULMS submarine would carry Smith's newly developed D-5 missile with the enhanced range of 6,000 nautical miles in tubes with nearly three-and-one-half times the volume of the Poseidon missile tubes (Dalgleish & Schweikart, 1984) and would be powered by Rickover's new twin natural circulation reactors, which would enable the submarine to reach top speeds of 26-27 knots (Dalgleish & Schweikart). The submarine would have a 42-foot hull diameter to accommodate both a greater number of the larger missiles (24 tubes) than the Polaris and Poseidon submarines (16 tubes) and the larger reactors (Navy League, 1997).

Enter Zumwalt

When Deputy Secretary of Defense David Packard learned of the Smith-Rickover compromise plan for the new submarine in September 1970, he flatly rejected the proposed compromised system (Spinardi, 1994). This compromise between Smith and Rickover did not satisfy Packard, and the plan was sent back to the newly installed chief of naval operations (CNO), Admiral Zumwalt, to resolve.

Zumwalt brought deep concerns to his new position about the Navy's aging surface fleet and the potential obsolescence of the Poseidon and Polaris fleet (Sapolsky, 1972). As part of his dual agenda, Zumwalt sought an early start to a new submarine building effort and to revitalize the surface fleet. Both goals had to be pursued within a constrained budget and held the promise of continual conflict with Rickover. Again, this influence of Rickover to the decision process illustrates the theories of Richard Stillman who wrote about the importance of knowing who are the key decision makers in each process and then attempting to influence those key individuals.

Zumwalt agreed with Rickover that nuclear power was essential to the future of submarine development, but he proposed to adapt an existing reactor design in efforts to reduce total program cost (Dalgleish & Schweikart, 1984). To preclude long battles with Rickover, and at the same time satisfy Packard's demands for a less expensive submarine system, Zumwalt pursued a new design option in October 1970. Zumwalt recommended a scaled-down version of the Smith-Rickover compromise. Instead of twin reactors, the submarine would have only one of Rickover's newly designed, but not as yet developed, natural circulation reactor's for a total of a 30,000-shaft horsepower capability (Dalgleish & Schweikart). The new engine design was dubbed the "Super-640." The Super-640,

though smaller than the Smith-Rickover design, would be nearly twice as large as the largest Polaris submarine engine (Dalgleish & Schweikart).

Zumwalt made no doubt that in his opinion that the Super-640 was not the ideal submarine. Zumwalt's own preference was to elongate the Navy's latest attack submarine, the SNN-688, so that it could hold the full sized ULMS missile (Dalgleish & Schweikart, 1984) Given Zumwalt's sense of urgency about the emerging threat from the Soviet Navy (Medalia, 1981), and the need to counter it with more submarines, he concluded that it was best "to make whatever compromises we had to make to get the boats built and he considered that it was better surrender to Rickover so he wouldn't have to surrender to Russians" (Schumacher & Zimmerman, 1988, p. 12). Again, this demonstrates the power of Rickover to influence the decision process. Specifically, Zumwalt was concerned with Rickover's position as informal leader of Navy ship design and thus Zumwalt was attempting to avert threats to his formal leadership role as CNO.

Another Design Development Decision

The Super-640, with its promise of new reactor design, immediately won the approval of Admiral Rickover and the Navy SP office. Rickover and the SP office set about solving the technical problem of vastly increasing the ballistic missile's range without greatly increasing the size of the submarine (Spinardi, 1994). The debate over the system's configuration grew more complicated in November 1970, when SP announced a preliminary design of an extended range missile that would fit into the existing launch tubes of the Poseidon/Polaris submarines (Dalgleish & Schweikart, 1984). By modifying the launch tubes to add a few more inches for a bigger missile, SP personnel theorized it

would provide some of the enhanced range at full payload that had been stipulated by STRAT-X and still be compatible with existing and or projected submarines (Spinardi). The new missile concept, dubbed EXPO, for Extended Range Poseidon, (McIness, 1986) would provide significant improved survivability and obviate the need for newly designed submarines (Spinardi). Zumwalt chose to give the go-ahead decision for the new "Super-640 submarine at a January 27, 1971, meeting of the ULMS Steering Group (Schumacher & Zimmerman, 1988). Zumwalt stated that he saw EXPO as "a way of defeating construction of a new submarine" and therefore this was unacceptable to both Rickover and to himself (Schumacher & Zimmerman).

In March 1971, Zumwalt appointed Rear Admiral Harvey E. Lyon as the new ULMS program manager (Spinardi, 1994). Lyon's title was Program Manager-2 and his task was to oversee development of the entire system, missiles, submarines, and support equipment and facilities. PM-1 Levering Smith would "support" PM-2 with missile development (Dalgleish & Schweikart, 1984). According to Zumwalt, Lyon's appointment became necessary when it was evident that Smith and Rickover could not talk to each other in a reasonable manner and so there had to someone who could talk with both of them (Polmar & Allen, 1982). A November 1971 issue of *Sea Power* magazine featured a photograph of Smith bearing the caption "Undisputed leadership over ballistic missiles development near an end?" (Schumacher & Zimmerman, 1988). This was a sign that the Navy considered Lyon to be the protégé of Rickover (Spinardi) and a means to ensure that Zumwalt could be in a more secure decision-making position over Rickover (Polmar & Allen).

OSD Decision by David Packard

Zumwalt's efforts notwithstanding, the ULMS project ran into the decision maker Deputy Defense Secretary David Packard for the second time. Packard had, in sending the Smith-Rickover compromise package back to the Navy for more work, been fairly explicit in what he hoped to see. According to the Navy, the deputy secretary had envisioned "a force of 30 to 40 submarines, possessing stealth characteristics, and minimum cost to be given the top priority in any OSD review" (Schumacher & Zimmerman, 1988, p. 19).

The basic elements of Packard's proposal were included in a Development Concept Paper (DCP) number 67 prepared by OSD and the Navy staff was released on September 7, 1971 (Spinardi, 1994). The purpose of DCP #67 was to provide a formal structure for a decision on ULMS and EXPO. The DCP included a brief statement of the system requirements for the ULMS and a discussion of related issues such as the proposed threat posed by likely advances made by the emerging Soviet antisubmarine warfare force. It then posed five options "for maintaining the deterrent effectiveness of our sea based forces" (Spinardi, p. 119). These options were as follows:

1. Do nothing (cancel ULMS and extended range Poseidon).
2. Extended Range Poseidon missile, IOC about Calendar Year (CY) 1977.
3. ULMS with IOC about CY1979 or 1980 or 1981 or 1982
4. ULMS, IOC about 1981, but with a parallel development of an extended range Poseidon missile to permit the deploying of an extended range Poseidon in CY 1977.
5. Extended range Poseidon missile, with IOC about CY 1977, followed by ULMS with a delayed IOC to about CY 1983 (Spinardi, p. 119)

Options 4 and 5 were the only serious contenders for adoption. Option 4, in the language of the ensuing discussion in DCP #67, called for research and development on

EXPO that would maintain the option of deploying it in the late 1970s. Option 5 would develop and deploy EXPO, but plan for a follow on ULMS ship and missile of a new design with an IOC of CY 1983. However, the DCP noted, a firm decision on ULMS characteristics under option 5 can be delayed until CY 1983 or later. This delay raised the possibility of indefinite postponement and even termination of the ULMS program (Spinardi, 1994). Secretary Warner recommended what he called a modified Option 4, which gave priority to ULMS but would develop and deploy EXPO as hedge. Warner proposed an ULMS ship configuration that was 18% larger, with 66% larger missile tubes, than the Super-640.

Packard's Decision

Just 1 week later, on September 14, 1971, OSD released a Secretary of Defense Decision Memorandum on ULMS. Though it was also billed as a "modified" Option 4, the direction the modification took made the acquisition decision seem much closer to option 5 and a defeat for the Navy (Spinardi, 1994). While never using the term "EXPO," Packard placed primary emphasis on the development of a missile with a range as close to 4,000 miles as possible. This missile, having an IOC of 1977, would be followed by an even longer-range missile and deployed on a new class of strategic ballistic missile submarines. Packard stated,

> The parameters of the new boat which are affected by the missile characteristics should not be established until work on the missile program has established range, performance, and size parameters for the new missile. Development of subsystem improvements, propulsion, quieting can and should proceed in parallel with the new missile development. The objectives of the ULMS program should be to bring a new force of reasonable cost in the early 1980s (Spinardi, p. 120)

Packard wrote that his plan would, among other things, "assure we can have a new force in the early 1980s" (Spinardi, 1994). He also stated the first priority for the new ballistic missile submarine is quietness (Spinardi) and made no reference to speed requirements (Schumacher & Zimmerman, 1988).

Decision Reversal

Packard's turnaround was the result of a conversation in October 1971 with President Nixon, who indicated White House support for a program that would increase the number of SLBMs and strategic submarines. Zumwalt credits Paul Nitze, in his capacity as Strategic Arms Limitation Talks (SALT) representative, with having already persuaded both Nixon and Packard of the importance of the ULMS program. Nixon hoped that a construction program would provide leverage to persuade the Soviets to include SLBMs in the SALT negotiations (Spinardi, 1994).

SALT had become one of the major foreign policy initiatives of the Nixon administration, and the president, who was facing re-election the following November, had staked a good deal of prestige on successful negotiations with the Soviets. In recent years, the Soviet Union had undertaken a dramatic buildup of its land-based ICBM missile force and had achieved numerical superiority in ICBMs. In addition, it had begun a massive program to build both SLBMs and ballistic missile submarines, an area in which it had consistently lagged behind the United States. While the U.S. had replaced its Polaris missiles with Multiple Independent Recovery Vehicle (MIRV) Poseidon missiles, it had not built new strategic ballistic missile submarines since the last Polaris had entered the fleet in 1967; nor did the U.S. have any ongoing SLBM construction program.

At the rate the two countries were building submarines and missiles, the Soviet Union would match the U.S. deployment of SLBMs by the mid-1970s and have twice as many missiles by 1980 (Schumacher & Zimmerman, 1988).

Nixon shared Zumwalt's sense of urgency about increasing the number of submarines. The Nixon administration had been seeking a freeze on ICBM and SLBM construction to prevent the Soviets from achieving superiority in both types of missiles (Dalgleish & Schweikart, 1984). The Soviets were balking and White House hopes for changing their minds had come to rest on the idea of a U.S. initiative centered on SLBM deployment. This hinged on using the SLBM deployment as a "bargaining chip," and traded for the Soviet SLBM construction program (Spinardi, 1994).

To analysts at both OSD and the White House, it was clear that ULMS itself was not a good bargaining chip. Its availability was too far in the future, even under the optimistic scenario for acquisition decision making posed by the Navy because the first ULMS submarine would not be completed until 1979 (Dalgleish & Schweikart, 1984). If the SLBM program were to have an impact on SALT proceedings, the Navy would have to speed up its deployment date. The most promising options were to build more Polaris/ Poseidon submarines or to convert attack submarines already under construction to launch SLBMs (Spinardi, 1994).

Packard went first to Rickover and asked about the feasibility of accelerating the ULMS ship construction program. On October 1971, Rickover responded in the affirmative. He assured Packard that the lead ULMS ship could be delivered by late 1977 and, beginning in 1978, submarines could be constructed at a rate of three a year (Schumacher & Zimmerman, 1988). This maneuver also speeded up the annual

production rate; thus the U. S. could have ten new ULMS submarines by 1980 (Spinardi, 1994). Even at this accelerated pace, however, ULMS did not compare favorably to other alternatives. Nevertheless, Packard agreed with Rickover's idea.

The Final Configuration

While officials at the White House and the Pentagon had been jousting over strategy, members of the ULMS project, understanding Packard's insistence on improving the case for an accelerated ULMS program, set about pinning down the basic design elements of the submarine. On November 9, 1971, Project Manager Admiral Harvey Lyon announced the result of their efforts. The ULMS submarine would incorporate a missile tube that was larger than the Super-640 version by about 10 feet in length and 9 inches in diameter, meaning that it would accommodate a missile roughly 60% larger than Poseidon but would not fit into an existing or modified Polaris submarine. The new submarine, with a 42-foot hull diameter, would displace 18,700 tons (compared to 14,000 for the Super-640) and would boast a reactor upgraded from 30,000 to 35,000 shaft horse-power (Spinardi, 1994). Explaining the boost in reactor power, Lyon stated,

> The reactor plant delivered more steam than was necessary, so the submarine could go faster than it was intended to go. For a Trident submarine, speed is not that important. We didn't scope the size of the plant for emergencies, where you need more power than speed. The second thing we did is, uniquely, something that is more powerful and bigger runs quieter at 25 miles per hour than a Datsun car does run. And that's the reason we put it in. We knew we could build a plant that would run quieter, and we wanted it to run quieter. Everything about Trident equaled or exceeded the specifications, including the reliability of the sub systems. (Schumacher & Zimmerman, 1988, p. 23)

The cast study illustrates the influence of Admiral Rickover throughout the entire decision-making process. Rickover mainly focused on two characteristics of submarine construction, namely speed and size. However, he understood that by controlling decisions on the size and speed of submarine construction he thereby controlled the entire submarine construction decision. Admiral Zumwalt, the IDA study, the Navy's SP office, and the entire Navy decision-making process were consumed by this influence by Rickover. Is this weapon system a success, one documented source would be inclined to say, "Yes" as illustrated in the following: Ohio Class (Trident) submarines are termed by the Navy as "The most effective warships of their kind in the world" (Navy League, 1997, p. 113). This author would state however, that the larger question for students of public administration is whether the technical achievements of this weapon system warrant the conclusion that the acquisition of this major weapon system was a success for the DoD? This author would conclude that this case study clearly illustrates several theories of decision making highlighted in the literature review chapter. The Trident case study demonstrates the consequences when an entire decision process was determined by a single individual who focused attention on just a few of the critical issues of submarine design and construction.

Case Study 3: The Multiple Launch Rocket System

During the late 1970s and early 1980s, a series of Army weapon acquisitions made news headlines for the wrong reasons. The M-1 main battle tank, the Bradley Fighting Vehicle, the Sergeant York anti-aircraft gun, and the Patriot missile system all became known for being developed over budget and behind schedule. During this same

period, the Multiple Launch Rocket System (MLRS) distinguished itself as a successful major weapon system acquisition program and as an example of a defense program that was produced "on-time" and "on-budget." This case study exemplifies the successful acquisition of a major weapon system program and illustrates the appropriate use of decision-making theories previously discussed in Chapter 2. Specifically, this case study demonstrates the value of effective communication during the decision-making process and the importance of maintaining a core of experts who make decisions throughout the acquisition decision-making process. These attributes illustrate the writings of key scholars such as of Stillman, Waldo, Wildavsky, and Follett.

The MLRS story is an example of a successful weapon system that was not allowed to fail during its acquisition phase, even as changes to its mission was dramatically enacted. This is a case study of how the people involved in the defense acquisition decision-making process changed the opinions of others that might have led this artillery piece toward a different decision point. The following quote from the GAO summarizes how this oversight agency viewed the success of this program:

> The successful MLRS program has had a stable and well-defined mission since early development, and the system's requirements and the defined threat have not changed during the program. In addition, the program's technical risk was low because the design did not require major technology advances. The program also has strong congressional support and adequate funding. Funding and program stability were enhanced by multiyear contracting and gave the contractors and the program office clear and unchanging goals to meet (GAO/NSIAD-90-160, 1990b, pp. 16-17)

MLRS Concept: The Beginning

It is official Army policy that a weapon should begin as a concept, a statement of a currently unfilled need, written by an officer of the Army Training and Doctrine Command (TRADOC). TRADOC is responsible for determining the necessary equipment to achieve the Army roles and missions in national security:

> TRADOC is the primary "user" representative in the material acquisition process. TRADOC performs assigned material and related functions for operational research and analysis, evaluation of products, operational and organizational planning, logistics support planning, and quantitative and performance requirement specifications for material systems, and other combat development functions required by the Department of the Army (Army War College, 1995, p. 14)

Only after a future weapon system concept is fully thought out are the development and acquisition officials then supposed to begin the acquisition decision-making process to turn that concept into an actual military weapon system. Specifically, in the MLRS program the following situation initiated this program.

In February 1974 a US Army Training and Doctrine Command (TRADOC) joint working group was established to assess the need for a general support rocket system (GSRS) with a counter-fire mission. This working group accomplished the preliminary technical review and cost estimate (DSMC, MLRS Project, 1980, p. B-1)

That working group study stated the Army needed to develop a tracked vehicle missile mounted launcher that can fire twelve eight-foot long rockets in less than one minute. This program was not typical of Army acquisition programs and accepted procedures of the DoD acquisition process were deviated from and will be illustrated in this case study.

Bigger but Not Necessarily Better Missiles

During the 1960s, the U. S. Army was faced with the possibly of a Soviet enemy that attacked in waves of forces. The Soviet forces that worried the U.S. Army war planners consisted of waves of main battle tanks. Each year more tanks came out of Soviet factories and more Soviet infantry units were converted into tank or mechanized infantry units. Each year brought increases in Soviet strategic nuclear arsenals, this reduced the credibility of the then American policy of retaliating against a Soviet conventional attack in Europe with a nuclear attack on the Soviet homeland (Haffa, 1988).

The Field Artillery Center, at Fort Sill, Oklahoma, is the Army agency charged with assisting TRADOC by determining what potential future weapons systems the field artillery should acquire. This center conducted a series of computerized simulations of possible future Soviet attacks against NATO forces then assembled in Europe. In these simulations, known as the "Red Leg" study, (Gudmundsson & Murray, 1987), the simulated Soviet attack consisted of large concentrations of tanks, to be fired upon by U.S. artillery. These Soviet tanks appeared in these scenarios "on the board" all at once, which was in accordance with the current Soviet tactic of mass and maneuver (Lomov, 1973). The current American artillery simulated in these studies was unable to effectively destroy these "surges" of Soviet tanks. The American Army howitzers simply could not fire fast enough to defeat all Soviet targets advancing toward the NATO forces (Haffa, 1988).

At the same time, in an effort initially unrelated to the studies being conducted at Fort Sill, the Advanced Systems Concepts Office (ASCO) at the U.S. Army Missile

Command began working on its own Multiple Rocket Launcher (MRL) concept. Herman Oswell, a Missile Command engineer working in the ASCO at the time, initiated this MRL program by writing a proposal for a single shot rocket launcher (Gudmundsson & Murray, 1987). Oswell called his concept the Highly Accurate Rocket System (HARS) and stated, "the objective to build a rocket system as accurate as a cannon; to get the advantage of rapid, area-saturation power and accuracy of a cannon" (Gudmundsson & Murray, 1987, p. 6). From this effort came the rocket design called Multiple Artillery Rocket System (MARS).

The MRL fired three rockets with Improved Conventional Munitions (ICM) warheads, the same sort of warhead planned for MARS. Rather than a solid block of high explosive, the warhead contained a number of "sub-munitions," which were baseball-sized grenades that were capable of incapacitating lightly armored vehicles such as, trucks, supplies, and unprotected infantry. The "sub-munitions" also were considered capable of punching holes through the relatively thin armor on the tops of the main battle tanks (GAO/NSIAD-91-144, 1991). In planning scenarios when NATO forces were equipped with these notional MRLs, the NATO forces won the battle and in the scenarios where NATO forces had no MRLs, they lost the battle (Gudmundsson & Murray, 1987). Army Headquarters and TRADOC were impressed with these study results.

In 1968, seven contractors submitted design proposals to build rockets for Missile Command. Two months later, five companies (Martin-Marietta, Northrop, Chrysler, Boeing and Vought) received contracts to study MARS for 6 months (Gudmundsson & Murray, 1987).

Convincing Field Artillery

Once these basic design decisions had been made, the Missile Command engineers set about to convince the Field Artillery group of the value of the modified MARS concept. The task, according to Oswell, was a matter of overcoming what we perceived to be a built-in bias within Field Artillery against free flight rockets. Oswell stated, "They had accepted guided missiles for special application like the nuclear weapon Pershing and Lance missiles, but when you talk about free flight rockets in the Field Artillery you are talking about something competing with their beloved cannons." (Strachan, 1983, p. 198).

Oswell found studies conducted by the Field Artillery group, which described a NATO battlefield scenario where the Soviets had far more tanks, planes and artillery pieces than had earlier been assumed in the simulation exercises. According to Colonel George Moses, a NATO war planner,

> It became clear that artillery in Europe was outnumbered by a factor of three or four to one. Attempts to correct this imbalance with rapid-firing howitzers soon proved impractical. Officers began looking to some form of an MRL as the possible answer to this dilemma. (Gudmundsson & Murray, 1987, p. 9)

The MLRS is the result of studies begun concerning battlefield scenarios of the late 1980-1990s. In particular, a need was identified for saturation artillery: a high volume of firepower in a short period of time. This need for saturation artillery could best be filled by a rocket system rather than by the cannon system. In February 1974, a TRADOC Joint Working Group was established to assess the need for a General Support Rocket System with a counter-fire mission (Drezner & Smith, 1990).

The idea of an American MRL also gained advocates at the Pentagon. David Hardison, Deputy Undersecretary of the Army for Operations Research, headed the task force that conducted a study of the military threat of the Soviet tanks attacking Western Europe countries. This experience converted him into an enthusiastic advocate for MRLs. Hardison convinced Army acquisition decision makers of the military value of using rockets by pointing to the cost savings that could result from the adoption of an American MRL. "Once people were convinced of the need for a counter-battery system, the argument was reduced to a discussion of exact numbers necessary to enable the system to be most effective" Hardison said (Gudmundsson & Murray, 1987, p. 10).

MRL's First Program Manager

In September 1975, the Secretary of the Army authorized the establishment of a project office to work on the development of what would henceforth be referred to as the General Support Rocket System (GSRS; Drezner & Smith, 1990). Colonel Kenneth Heitzke, a Field Artillery officer who had considerable background in DoD acquisition program management, was assigned to Missile Command and appointed as the first program manager (DSMC, 1980, page B-2). This is an example of the decision-making theories of Stillman when he wrote on the importance of using experts placed in respected positions in the decision-making process.

Heitzke and all other subsequent acquisition program managers would spend most of their time building and maintaining a consensus in favor of GSRS within the Army, the DoD, and Congress. This illustrates the academic theories of Mary Parker Follett of using constant communication as a means to garner support for a decision, especially important

in its implementation phase. Heitzke stated that the acquisition program manager was to be an "advocate" for his or her program as it goes through the defense acquisition decision-making process" (Gudmundsson & Murray, 1987, p. 10).

> Good project managers instinctively recognize this point. The Army's MLRS is widely seen as a technical success. MLRS program managers are reported to have spent "most of their time building and maintaining consensus in favor of GSRS (an earlier acronym for the same project, standing for general support rocket system) within the Army, the Department of Defense and in Congress." The project's first manager referred to himself as "advocate: and left the "crafting of the acquisition strategy, as well as its execution" to his deputy and to the technical experts in the developing firm. (McNaugher, 1989, p. 133)

The first person that Heitzke requested to join his acquisition team was Lawrence Seggel, an industrial engineer who had just finished working on the Lance missile system program (DSMC, 1980). Heitzke appointed him deputy acquisition program manager, a job Seggel was to hold for more than 12 years. Again, this illustrates the writings of Max Weber (1978), in which he describes why and how a bureaucratic system is set up and allowed to operate. Seggel's first mission was to formulate an acquisition strategy for the GSRS.

David Hardison, a senior DoD Policy bureaucrat, provided the framework for crafting the acquisition strategy. Hardison believed that failure to meet high expectations had terminated the MARS program. He therefore advocated a technologically conservative approach throughout the decision-making process. He went on to state "Our strategy is to set modest goals and then exceed them" (Gudmundsson & Murray, 1987, p. 11). For example, the warhead was an ICM warhead similar to what had been envisioned for MARS. Unlike the MARS warhead, however, the GSRS warhead was never designated as a tank killer. Its role and mission on the battlefield would be to attack "soft"

targets, in particular, enemy field and anti-air defense artillery forces. The technology involved in building a warhead was proven and had earlier been incorporated into the howitzer and Lance missile (Sammet & Green, 1990).

Seggel's Management Style

As Seggel saw it, the chief prerequisite to a successful acquisition decision making was a free hand in its planning and execution. This is congruent with the writings of Anthony Downs on the evolution of bureaucracy. To obtain this efficiency, he motivated his superiors, the Commanding Generals of Missile Command and Army Material Command, to field GSRS as soon as possible (DSMC, 1980).

> I went forward with a program plan that was right out of the acquisition process guide. It was going to take nominally 120 months. I knew that wasn't going to satisfy the stated military requirement. But I wanted to find out where they were coming from. The DoD acquisition decision makers said, "Good God, you don't understand, you dummy. Go back and shorten that (acquisition decision-making process) thing up; get the time required for the development down to reason. (Gudmundsson & Murray, 1987, p. 11)

To achieve this early fielding of GSRS Seggel's plan involved dispensing with a lot of rules and investing the program manager with an unusual amount of discretion. He got permission to start producing some components before other components had been developed (Drezner & Smith, 1990). The term used for this technique of producing some components before other components had been developed and fully tested is called "concurrency." Program managers must manage concurrency carefully for it can add risk. However, concurrency does possess the capability to significantly reduce the time necessary for a program to proceed through to the acquisition decision-making process and thus lower total program cost (Sammet & Green, 1990).

Cost Control in the Program

Another major element of Seggel's acquisition strategy was cost control (Comptroller General, 1982). The MARS program made him aware that his job was not to build the best GSRS possible; rather it was to build the best GSRS within given cost parameters. Seggel reduced labor, overhead, and research cost estimates by 20 %, thereby providing a target cost for the GSRS contract (Gudmundsson & Murray, 1987).

Seggel's plan for inducing contractors to stay within these cost constraints was to maintain competition among the contractors bidding for this program (Comptroller General, 1982). Estimating that there were at least 10 firms in the United States that had the ability to develop and build MLRS, he planned a number of opportunities to force them to compete against each other through competitive bidding (GAO/NSIAD-90-160, 1990b). Seggel's ultimate goal was to get the lowest unit price for the MLRS rockets. Since the Field Artillery planned to buy 400,000 rockets, each dollar shaved off the price per rocket would save significant money (Nichols & Rossi, 1994).

In order to shorten the production timetable, it was suggested to Seggel that he let the contractors develop competing GSRS prototypes without any input from Missile Command (Drezner & Smith, 1990). Seggel was told the quality of the prototypes would be guaranteed by the private sector competition.

In December of 1976, the plans were reviewed by the Army Systems Acquisition Review Council (ASARC), a committee composed of Army Generals and high ranking Department of the Army civilians (DSMC, 1980). The council recommended, and the Secretary of Defense concurred, that the two prime contractors "validate" the GSRS concept by building three prototype launchers and a few hundred prototype rockets during

a 29-month "validation phase" of the acquisition process (Drezner & Smith, 1990). In February 1977, the "functional configuration" nearing completion, Secretary of Defense Harold Brown acting on advice from the Defense Systems Acquisition Review Council (DSARC) authorized the of GSRS (Turner, 1990).

Building Missile Decisions

In April 1977, Missile Command issued a Request for Proposal (RFP) to 31 companies which described, in great detail, the GSRS concept and solicited bids for the construction of three prototype launchers and approximately 300 test rockets (DSMC, 1980). In addition, the firms who won the contract were expected to examine the best ways of mass-producing the launchers and the rockets (Gudmundsson & Murray, 1987). The winners, announced in September 1977, were Vought and Boeing Aerospace, and were awarded contracts valued at $29.8 million and $34.5 million respectively (Drezner & Smith, 1990).

Vought had the initial advantage in this competition because the Vought people assigned to building the prototypes had been previously working on GSRS (DSMC, 1980). Many of these people were veterans of the Lance missile program. Vought's detailed knowledge of both rocket technology in general and the GSRS concept in particular allowed them to immediately begin building and testing prototype rockets. In December 1977 Vought fired its first GSRS rocket. By the end of September 1978, Vought had successfully fired 11 rockets (Gudmundsson & Murray, 1987).

Boeing, having less experience in rocket technology, had to begin prototype efforts in the laboratory. By September 1978, Boeing had not yet decided whether its

rockets were to have fiberglass or steel motor cases; thus, Boeing did not begin firing rockets until April 1979 (Gudmundsson & Murray, 1987). Despite this slow start, GSRS progressed smoothly throughout the first 2 years of its development (DSMC, 1980).

International Production Considerations

When Secretary of Defense Harold Brown authorized the validation of GSRS, he ordered an investigation into ways to involve other NATO countries in the purchase of this weapon system. His intentions for including NATO members were in accordance with the Culver-Nunn Amendment, which required the Secretary of Defense to attempt to design U.S. weapons, that used compatible ammunition with their NATO counterparts (Brown, 1983). Throughout 1977 and 1978, the meetings on both sides of the Atlantic Ocean resulted in France, Great Britain, and West Germany agreeing to build GSRS rockets in Europe. The four nations signed a memorandum of understanding formalizing the relationship in July 1979 (DSMC, 1980). British and French support for GSRS development took the form of cash grants of $15 million each, and German participation consisted of initiating a program to develop a rocket that was capable of scattering the "Medusa" anti-tank mine warhead (Drezner & Smith, 1990). Germany was interested in the "Medusa" warhead to preclude a Soviet tank invasion across Germany (GAO/NSIAD-91-144, 1991).

The immediate effect of this agreement was a change in the designation of the GSRS system. Henceforth, it was to be known as the Multiple Launch Rocket System (MLRS), a name that fit in well with European terminology (Gudmundsson & Murray, 1987). Missile Command had decided that the 8 inch rocket was the optimum size;

however, it was not large enough to carry the "Medusa" mine warhead with any efficiency. Vought and Boeing were forced to make changes to their contract, which required them to develop 9-inch rockets. Not only did the rockets have to be redesigned but the pods in which the rockets were packed also required some alterations (GAO/NSIAD-91-144, 1991).

The "internationalization" of MLRS had a beneficial effect on the program. Albert Yee, who served as Vought's program manager for MLRS, gives the memorandum of understanding credit for helping to maintain the MLRS program:

> Those people within the Army, the DoD and Congress who might have been inclined to make the decisions to "stretch out" the MLRS program could easily be dissuaded from wielding their fiduciary scalpels by the general desire of the United States Government to honor the international commitments contained in the memorandum of understanding. "Co-development of MLRS", Yee said, "Became considered a prime example of how the "two way street" approach could work." (Gudmundsson & Murray, 1987, p. 14)

Outside Support

Internationalization alone was not enough to ensure the survival of the MLRS acquisition program. Any one of the following organizations, the Field Artillery, TRADOC, the Army Chief of Staff's office, the Secretary of the Army, OSD, and Congress had the power to terminate the acquisition program. While Seggel worked to keep the design and the contractors in line, the program managers worked to convince these organizations that MLRS was worth their support (Sammet & Green, 1990). This again illustrates the necessity for effective communication with all parties in the decision-making process written about by Mary Parker Follett.

The first program manager, Colonel Robert Heitzke, spent the bulk of his efforts selling MLRS to the acquisition decision makers at the higher levels in the DoD (DSMC, 1980). Hardison had already managed to convince TRADOC and the Army Chief of Staff, as well as the commandant of the Field Artillery Center and School, to support the system (Gudmundsson & Murray, 1987). As a result, Heitzke did not spend much time briefing them on the progress of the program. It was crucial, however, that the influential OSD/Program Analysis and Evaluation Office (PA&E) not oppose the idea. Happily for the MLRS program, OSD/PA&E was favorably disposed towards rockets and did support the program (GAO/NSIAD-90-160, 1990b).

Convincing Congress to support MLRS was somewhat more time-consuming. Heitzke spent a great deal of time on Capitol Hill, not only talking to committees, subcommittees, and individual members of Congress, but taking the trouble to keep the staffers very well informed on the cost, schedule, and technical issues within the acquisition program. Heitzke's efforts in Washington DC worked well for the program. He so successfully convinced Congress of the Army's need for MLRS that the FY 1977 budget provided $4 million more than the DoD requested (Drezner & Smith, 1990). Again, reflects the importance of Congress to fund the defense acquisition programs that is well documented in the writings of Wildavsky.

Role of the Contractor in This Program

One of the major arguments in the rhetorical arsenal of the MLRS program managers was the cost effectiveness of this system. While the bulk of the savings would come from reduced manpower costs, the fact that MLRS kept within its assigned budget

limits was a major selling point for the program. This value of maintaining cost profiles was not lost on the supporters of the program, particularly within Congress (Gudmundsson & Murray, 1987). During the validation phase of the program, both Vought and Boeing actively participated in this effort by charging the government less than what they actually spent on building the prototypes (Turner, 1990). Billie M. Smith, the Vought program manager for MLRS, explained that Vought was willing to lose money in the immediate short term for the future prospect of profits Vought would reap if it won the right to produce all MLRS components (Gudmundsson & Murray, 1987).

Prototype Testing

No production contracts would be issued until after the prototypes were thoroughly tested. By the summer of 1979 both contractors were firing prototype rockets from prototype pods loaded on prototype launchers. The SPLL began testing in August 1979 (Turner, 1990). The final test was conducted by the Operational Test and Evaluation Agency at the end of the validation phase. It consisted of three batteries of tests. Operational Test 1 (OT 1) and Operational Test 2 (OT 2) were non-firing tests whose purpose was to determine the reliability, maintainability, survivability, and transportability of each prototype. In addition, OT 1 and OT 2 tested the ease which soldiers could learn to use each weapon and how each system weapon could fit within the already existing Army organization (Drezner & Smith, 1990).

The use of testing was congruent with governing regulations that determine defense acquisition. These directions were specified in DoD regulations as such:

> Test and evaluation programs shall be constructed to provide essential information to decision-makers, assess attainment of technical performance parameters, and determine whether systems are operationally effective, suitable, and survivable for intended use. Each Military Department shall establish an independent operational test and evaluation activity, reporting directly to the Service Chief, to plan and conduct operational tests, report results, and provide evaluations of effectiveness and suitability. (Department of Defense Instruction, 1996, p. 6)

Operational Test 3 (OT 3) was a live fire "shoot-off" between the Vought and Boeing prototypes that took place in the Winter of 1979-1980 at White Sands Missile Test Range, New Mexico. A firing range was set up with an array of targets placed at various distances. Each prototype had to engage the targets in a particular sequence and was graded on the accuracy and responsiveness of its fire (Gudmundsson & Murray, 1987).

The next step in the MLRS acquisition process was the program "maturation" phase. According to Seggel's master plan, only one contractor would work on MLRS during the production phase, although that contractor's work would be divided among three different contracts (DSMC, 1980). The full-scale development contract provided for improving those aspects of the MLRS design had proved deficient in the course of the validation phase of testing. The low rate production contract required the contractor to start building test rockets and MLRS launchers before the production facilities were finished (DSMC, 1980).

The decision as to which of the two validation phase contractors was to win the production phase was to be made by a Source Selection Evaluation Board convened by the commanding general of Missile Command (Drezner & Smith, 1990). On April 29, 1980, Missile Command announced that Vought had been chosen as the prime contractor for the production phase, citing Vought's cost proposals and marginally greater accuracy.

Within 3 months, Vought was awarded contracts having a total value of $115.8 million for the low rate production and initial production facilities. In 1981, the program received $70 million for research and development $112 million for procurement (Nichols & Rossi, 1994).

Production Decision Is Reached

Vought decided to build its production facilities at the Highland Industrial Park in Camden, Arkansas, where both Vought and Boeing had built their prototypes. The low rate production contract called for Vought to deliver 12 launchers and 1,374 rockets before January 1982. These items were to be used for the training of crews and mechanics, as test beds for improvements being made to the system, and for future testing. The contract was a fixed price plus incentive fee contract for $26.9 million. Since the rockets and launchers would be built without the benefit of mass production facilities, the unit cost of these items exceeded the expected cost of mass produced rockets and launchers (Turner, 1990).

On August 21, 1982, Vought presented the Army with the first production SPLL. Seven months later, on March 31, 1983, the first MLRS operational unit was formed at Fort Riley, Kansas. After that, MLRS batteries were fielded at the rate of approximately three per month (Turner, 1990).

High Rate of Missile Production Decision

Seggel's original strategy for high rate production had called for two competing firms to produce the MLRS rockets. However, a study conducted by the Systems Analysis

Division at Missile Command convinced Seggel and Program Manager Cianciolo that a 5-year sole source production contract with Vought would save more of the taxpayer's money (Drezner & Smith, 1990). According to Herman Oswell, program financial advisor, the potential savings from competition were not sufficient to cover the cost of investing in the plant and equipment needed to set up a second source of producing these sophisticated rocket systems (Gudmundsson & Murray, 1987).

The project office thus changed its strategy. Rather then rely on competition to keep the cost of the rockets down, it would attempt to "lock in" Vought's low price with a 5-year firm fixed price contract. This is an example of Dwight Waldo's rational action, the action correctly calculated to realize desired goals within the decision process. This multi-year contract would further reduce costs by permitting Vought to obtain materials at a quantity discount and leases for long-term rates (Drezner & Smith, 1990).

In March of 1983, Missile Command awarded the multi-year contract, worth $1,236 million to Vought Corporation. Estimates vary of how much money the government saved by using the multi-year contract. In Fall 1985, 2.5 years into the 5-year contract, Missile Command provided the GAO with a funding figure of $209.1 million saved over the life of the program. The GAO's own estimate, presented to Congress in October of 1985, predicted a savings of approximately $180 million. Vought explained the difference in dollar amounts by pointing out that the GAO and Vought used different standards in their estimates (Drezner & Smith, 1990).

Although technical problems were encountered during the changeover from low to high rate production, they were not sufficiently disruptive to change the production schedule or present Vought with the possibility of losing money on the multi-year

contract (Gudmundsson & Murray, 1987). At the end of the multi-year contract, however, Vought's total MLRS associated sales had brought in $2 billion. In 1986 Vought told *Aviation Week and Space Technology* that it hoped that follow-on orders would bring in yet another $2 billion. It is worthy of note that people inside Vought often refer to MLRS as the "salvation of the company" and MLRS launchers have prominent places in the senior offices of Vought decision makers (Gudmundsson & Murray, 1987).

> The MLRS is often held up as a successful program: it came in with only a minimal schedule slip, and cost and performance goals were attained. Reasons for this success include steady Congressional, OSD, and Army support; adequate funding; reduced system complexity; strong management and planning from the beginning and clearly stated and unchanged user requirements. The success of the program is probably due to all of these factors working to reinforce each other. (Drezner & Smith, 1990, p. 172)

The MLRS acquisition program continues to acquire additional weapons systems today whereas, both the B-2 aircraft and/or TRIDENT submarine acquisition programs have been truncated from their original planned total program. While B-2 and TRIDENT assets are deployed in the operational inventory in a limited number they are searching for a new role and mission to sustain their useful life.

> The U.S. Army is experimenting with the prototype of a lighter version of the MLRS mounted on the back of a five-ton truck. The High Mobility Artillery Rocket Systems (HIMARS) is smaller than the standard MLRS mounted on a tracked vehicle. HIMARS would be able to fire the complete set of MLRS munitions and its fire control system, electronics and communication units are interchangeable with the standard MLRS launcher, and the crew training are the same. ("U.S. Army to decide on more mobile MLRS," 2000, p. 21)

This case study illustrates an acquisition program's success by using public administrations decision-making theory. By using the same skilled experts on the MLRS program for a longer period of time, as Stillman articulated, the MLRS program has a core group of decision makers who are very familiar with the issues and successfully

work the problems of defense acquisition on a daily basis. By using good communication techniques, as suggested by Follett, the benefits of these weapons are accurately informed to all other necessary decision makers in the process, for example Congress and industry. By understanding the importance of the budget funding process, as stated by Wildavsky (1992), the program remains funded. By using discretion and adapting to the changing environment, as written about by Gaus, the decision makers make the necessary rational actions, as described by Waldo. Collectively, these theories are observed in this successful example of defense acquisition decision making.

Summary

This chapter reviewed the decision-making process during the acquisition phase of three major defense weapon systems. The first case study illustrated the need for effective communication to all decision makers in the process. The second case study illustrated the need for a balance in the power and influence of all actors in the decision-making process. The last case study demonstrated a successful approach of using decision-making theories illustrated in the literature review. The next chapter relates those observations to the themes of academic decision-making theory already presented and determines how the defense department could be changed to reflect these decision-making theories in the practice of acquiring major weapon systems.

CHAPTER 6

SUMMARY AND RECOMMENDATIONS

Summary

An accurate independent analysis of a nation's defense acquisition decision process is a difficult undertaking. It is even more difficult to accurately analyze the security implications of acquisition decisions on a regional or global scale. This task is particularly difficult today in light of the escalating pace of the development and use of high technology infused into military weapons and the politico-security uncertainties of the global theater of international diplomacy (Binkin, 1986). The study of national security decision-making processes can arouse apprehension among those officials who are involved in the process:

> The time required to define and develop a new weapon system is an important element of the overall acquisition (decision-making) process. Programs that are unnecessarily lengthy tend to dilute the level of technological advancement represented by fielded forces, while highly accelerated programs incur added risks of unscheduled delays and potentially high rework costs. A recurring theme of defense critics is that most programs err on the side of being too lengthy and that policy reforms should be introduced to shorten the development cycle. (Drezner & Smith, 1990, p. iii).

> Due to possible media coverage of acquisition that might reflect inefficient and ineffective decision-making processes government sensitivities are heightened when a nation's arms procurement decision-making process is scrutinized. (Singh, 1998, p. 1)

The analysis developed in this dissertation is based on the decision-making theory published by academic scholars. This final chapter compares those academic theories to

the DoD acquisition decision-making process and offers recommendations to reengineer that decision process. The reason reengineering is necessary and important is, despite past efforts to reform DoD decision making, the current process is wasteful and adds billions of dollars to the costs (DSMC, 1989).

> The history of government reform is littered with plans to make government less bureaucratic, more responsive and less wasteful. Although most have failed, many of the procurement and information technology reforms instituted in the 1990s have helped clean the federal government's house of red tape and shut, if not slammed, the door on wasteful spending (Holmes, 2000, p. 3)

One reason that causes the high cost of defense programs is the failure of the DoD to possess an efficient and timely acquisition decision-making process (Fox, 1989). An example of this inefficiency is illustrated by the military services' habit of projecting unrealistic cost estimates, overly optimistic weapon development schedules, and zealous system technical performance predictions (Fox, 1989). This problem of inaccurate estimation becomes acute when the DoD is concurrently developing and producing the weapon before adequate developmental and operational testing is completed (GAO/HR-95-4, 1995a).

To answer this criticism, the DoD states that it is committed to reforming its major weapon acquisition decision-making process and making it more efficient and effective (Kaplan, 2000). Top DoD management officials also recognize that because of recent budget fluctuations, it is now critically necessary for cultural and structural changes to amend this decision process (Kaplan). While the DoD is focusing its efforts to reform this decision-making process on three areas, they are still not comprehensive enough to make the process efficient, hence the need to reengineer the entire decision-making system. The DoD proposed three acquisition reforms: (1) eliminating redundant

weapon requirements; (2) producing realistic cost and schedule estimates; and (3) reducing high-risk acquisition strategies such as excessive concurrency during the production phase of the process (GAO/HR-95-4, 1995a).

These three changes to the decision process have been mentioned as conclusions in previous DoD acquisition studies. Bill W. Thurman, Deputy Director for Planning and Reporting National Security and International Affairs division of the GAO gave this testimony on his thoughts of needed acquisition decision making changes before the House Armed Services committee:

> I appreciate the opportunity to discuss the reorganization of the defense acquisition organizations... at your request; we (GAO) are currently reviewing a number of acquisition reorganization issues, including
> - How the military departments approached acquisition reorganization
> - Changes in the civilian/military balance within the acquisition organizations
> - The roles of the military staffs in the acquisitions process. (GAO/T-NSIAD-88-28, 1988, p. 1)

To establish the need to embrace the extent of change necessary to achieve adherence in the DoD acquisition decision-making process to the theories of decision making a review of the literature is necessary to illustrate why, where, and how changes are necessary.

Lessons From the Literature Review

One of the critical authors from the field of Public Administration that offers insights in the study of decision making is Charles E. Lindbloom (1959). In "The Science of Muddling Through," Lindblom outlines two possible methodologies for decision making: root rational comparison (theory) and branch successive comparison (experience; Shafritz, Hyde, & Rosenbloom, 1981). The root rational method undertakes a systematic

comparison of possible decision alternatives to determine which alternative would attain the greatest value (Shafritz et al.). This approach is found in the initial phase of the defense acquisition decision-making process called the "product definition" phase. For example, when the military services portray an initial need for a new weapon system to address an emerging enemy military threat, many alternatives are initially offered to address this emerging need (Sammet & Green, 1990). A dramatic decision is made at Milestone 1 when a specific weapon system solution is decided as the answer to this threat. After Milestone 1, the decision-making process produces only incremental benefits derived by modification to the initial decision. The incremental decision making exhibited for the remainder of the acquisition process illustrates Lindblom's second type of decision making, the branch model.

In the branch model, the decision makers attempt to implement change through continual modification of the initial decision. This muddling through decision process is a contributory reason why the defense acquisition process typically takes approximately 10 to 15 years to field a new weapon system (Gansler, 1989). The duration of the present defense acquisition decision-making process is too long and must be reduced if adherence to decision-making theory is to be achieved.

Whereas the root model assumes that the acquisition decision makers have an unlimited amount of time and posses complete information of all necessary facts bearing on the decision available for them to make their decisions, neither of these assumptions exists in DoD decision making and thus adversely affect the decision process. The impact of these assumptions, unlimited time and complete information, for example, could be that the original military security threat to the nation may not continue as originally

estimated throughout the entire acquisition process, which was illustrated in the B-2 bomber case study.

The branch model was illustrated in all three case studies. The decision-makers confined themselves to incremental decision making, which led to pragmatically selecting from the immediate available choices without attempts to reduce long term risk to the program (Shafritz et al., 1981). In two of the three case studies, the total number of major weapon systems was dramatically reduced: the Navy bought only 14 TRIDENT submarines and the Air Force bought only 21 B-2 bombers. This decision of buying a lesser number of submarines and bombers does fit well with the American political system where gradual changes are favored in defense acquisition decision making (Davidson & Oleszek, 2001).

Public administration scholars have written on the topic of leadership, a theme related to decision making and well illustrated throughout the case studies. Some of these scholars are Follett, Bernard, Fiedler, and Bennis. Mary Parker Follet wrote on the topic of leadership, which is critical to the overall success of decision making. Follett's major essay, "The Giving of Orders," applies both to leadership and defense acquisition decision making. Her theme is that these orders (decisions) from leaders should be given directly to the implementers of those decisions (Ott, 1989). It is therefore incumbent upon the defense acquisition process to use an organizational structure that maintains a short span of control with acquisition workers. For example, in the Trident case study, Rickover conveyed his decisions directly to the individual who was to implement that decision (Schumacher & Zimmerman, 1988). To ensure that each subordinate understand this short span of control, all nuclear propulsion officers needed to successfully pass a

personal interview with Rickover before their assignment onboard nuclear submarines to preclude any misinterpretation of his expectations and their complete loyalty to immediately follow his decisions (Polmar & Allen, 1985).

In the MLRS case study, each Army program manager was able to garner and maintain DoD, Congressional, and Allied support for the program through direct communication with its customers (GAO/NSIAD-90-30, 1990c).This commitment to direct, frequent and effective communication ensured the ultimate success of the MLRS program.

Chester I. Barnard (1938) identified communication in his work, *The Functions of the Executive* as the key element for effective leadership. He specified that for communication to be totally effective it must be impersonal, in that the decision-maker was not dependent upon emotional persuasiveness, but on the logic of the content of the discussion to communicate its meaning (Ott, 1989). Bernard states that there are three functions of the leader: communication, promote the health of the organization, and to formulate the goals of the organization (Shafritz et al., 1981). The DoD leaders in acquisition decision-making process offer both pro and con illustrations of these functions of leadership. Due to security constraints in the B-2 stealth bomber program, all "stealth" technology characteristics were not able to be communicated to all congressional personnel or to the public in a timely manner (Atkinson, 1989). This lack of direct communication became a critical disadvantage for the program. Additionally, this lack of direct communication later weakened the possibility for garnering the necessary congressional support as the mission of the program changed, which contributed to a significant reduction in its funding and ultimately to an early termination

of the program. Whereas, in the MLRS program, leaders were permitted to effectively communicate the program benefits openly and throughout the decision process to congressional personnel, military allies and to the general public that led directly to a well funded program (Gudmundsson & Murray, 1987).

Another scholar who wrote on leadership is Fred Fiedler. Fiedler's leadership concepts are illustrated in his work *The Contingency Model*, which expresses two views of leadership based on attitudes and behaviors (Ott, 1989). The first type of a leader is characterized as an "autocratic" leader who is characterized as being task oriented. The military departments that can be described as using "autocratic leadership," assign senior officers to the defense acquisition decision-making process to perform various roles of responsibility. Their measure of being a successful program mangers is to continue, if not increase the size (defined by units produced and total program fiscal value) of their program, during their tenure in that position of leadership (Fox, 1989; Sammet & Green, 1990). A problem for program stability is that the DoD usually maintains these officers at their post for only 2 years (Fox, 1989; Sammet & Green, 1990). Hence the military officer can believe he or she has the need to accomplish something significant for the program in a short period of time or face the likelihood of not being promoted to the next military rank and thus, ultimately being removed from military service (Sammet & Green, 1990). Hence, the military officer in this role of program manager will "drive" the program because of this perceived need that something must be accomplished during his short tenure (Fox). A possible impact from this desire to demonstrate leadership in the program is that decisions are made for short-term program gains without the necessary long-term vision to assure ultimate program total success (Sammet & Green, 1990).

The second type of leader Fiedler describes is the "democratic" or "people oriented" style of leadership (Ott, 1989). This leadership style can be found more readily with civilians in program leadership roles vice a military officer assigned to the role of program leadership (Fox & Field, 1988). The civilian acquisition leader is usually a career bureaucrat who has a much higher probability to remain in the defense acquisition decision-making process for an extended period of time than the military officer (Fox & Field, 1988). This concept of civilians remaining with an acquisition program longer than military officers was illustrated by Seggel in the MLRS program. Seggel remained with the program for over 12 years (Gudmundsson & Murray, 1987). With civilians maintaining greater longevity in program management positions, they are then more apt to make decisions based upon a long-term view than military program managers (Fox & Field, 1988). Thus, the civilian manager then better understands that the decision-making process is a consensus building, long-term experience in which one individual will not "win" all arguments or discussions (Sammet & Green, 1990). Also, when decision making is viewed in this long-term incremental approach, the value of experience in defense acquisition decision making also illustrates Stillman's point of the important role of building personal relationships in decision making (Stillman, 1996).

The third writer on leadership is Warren Bennis. Bennis articulates the necessary trait to become a successful manager by empowering subordinates and striving to make all employees in the organization believe that they accomplish a significant role in that organization. He explains that there are three methods to accomplish this task (Shafritz, et al., 1981). The first technique is "management by meaning," in which, Bennis explains that the leader must be an effective communicator. Bennis's second trait of leadership is

"management by trust," which he defines as the leader must act in an anticipated versus an unpredictable manner in every situation so that there is less subordinate frustration in trying to satisfy the announced goals of the leader. The employees must also be able to predict what their leader will want and what their leader will probably decide as future decisions. For example, DoD should have anticipated the likelihood of a reduced B-2 program when the Soviet Union's military threat diminished while the U.S. concurrently faced fiscally constrained times (Kapstein, 1993). Consequently, the Congressional decision to curtail the program at 21 (versus 132) bomber aircraft should have not been a surprise to the DoD decision makers because it reflected changes in the world's security environment, the large cost associated with the program, and a change to national priorities (GAO/NIASD-97-181, 1997b).

The Trident program was proceeding through the defense acquisition process on the previously planned time schedule and within the known cost estimates; however, the program was terminated after acquiring the 14th submarine instead of the 24th (CBO, 1993). This decision was influenced by changes in the external environment; for example, the end of the Cold War and pressure by the State Department to achieve a START II treaty by reducing the number of Intercontinental Ballistic Missiles in the United States inventory (Holland, 1997).

The third example is the MLRS program. This program was successfully managed to be "on-schedule and on-cost" and is the only one of the three case study programs still in production today (GAO/NIASD91-144, 1991). This program also allowed U.S. to begin a "teaming" approach to defense acquisition with several of our allied nations (GAO/NSIAD-91-144, 1991).

Paul Sabatier and Daniel Mazmanian (Stillman, 1996) wrote a critical analysis essay on the issue of the proper decision implementation. Their work, " The Conditions of Effective Implementation," illustrates the need for decision-makers to be sure that decisions are implemented in a manner congruent with their intent. The thesis of their essay addresses when a decision changes a program's content it will achieve its objective only when the new objectives are clearly understood and agreed to by those individuals who will implement the program (Stillman). This illustrates the issue that communication among decision-makers is a very critical element within the decision-making process. For example, as illustrated in the B-2 bomber case study, there was a discussion of possible distrust built between the DoD and Congress because of the high level of security requested by the DoD for this program (Commission on Roles and Missions [CORM], 1995). Specifically, this perceived "distrust" was caused by limiting the full program details from all members and staffers in Congress and resulted in the perception of some staffers that the DoD tried to "hide" some weak parts of the program (Atkinson, 1989).

Current Defense Acquisition Issues That Will Impact the Decision-Making Process

There is a new focus on the necessity to reform the defense acquisition decision-making process. The theme of this new reform is to organize the decision-making process and make it more reflective of current commercial business practices (Colin Clark, Defense News, June 19, 2000, p. 4) The methodology to incorporate current commercial business practices into the DoD is called "reengineering" (Hammer & Stanton, 1995). This "reengineering" is a systematic disciplined improvement approach that critically examines and redesigns mission-delivery decision-making processes to achieve

improvements in performance areas important to the customers, process owners, and stakeholders (Slater, 1999).

This objective of incorporating reengineering into the DoD acquisition process attempts to answer the question "Why can't DoD simply do efficient decision-making like commercial business?" The subject of making the DoD acquisition decision process more reflective of commercial decision making has been illustrated by the following issues highlighted from past government studies:

> Even when commercial products are not suitable for DoD's purposes, it can still use commercial buying practices to real advantage (Packard Commission, 1986)
>
> ...although the increased use of commercial equipment in DoD is good, increased use of commercial practices could be even better (Defense Science Board, 1986)
>
> ...apply private sector management tenets across the broad spectrum of federal government (Grace Commission, 1984)
>
> We seek to enable the executive branch to ensure that DoD procurement operations are businesslike (Commission on Government Procurement, 1972). (Sweeny, Perkins, & Spencer, 1989, p. 4)

Given this developing impetus to use commercial practices in DoD acquisition decision making, the question remains, "Why doesn't the DoD simply adopt these commercial practices?" The usual answers to this question include, it would be necessary that some laws and regulations would have to be changed or that many of the impediments to DoD adopting commercial practices are rooted deeply in the institutional culture of the DoD (Sweeny et al., 1989).

Perhaps the most critical reason for not quickly implementing these changes is the problem of having the necessary DoD individuals agree with a definition of exactly what are "commercial practices." Specifically, there does not seem to be a reasonable general

understanding of what it means for the DoD to make decisions "like commercial business." One DoD definition of commercial practices is "less bureaucracy, cheaper development cycles, more flexibility and faster decision-making, and more accountability for the results of decisions made" (Soloway, 2000, p. 44).

The factors of less bureaucracy, faster, cheaper, and more flexibility in decision-making are the benefits derived from an idealized commercial acquisition decision-making system (Sweeny et al., 1989). These benefits are objectives to consider in defense acquisition decision making as a relationship with the academic topics of "leadership" and "power."

This intermingling of "leadership" and "power" concepts is expressed as follows:

> The task of leadership in small groups is to help the group develop a sense of direction and commitment to that direction. Whether leadership is shared or individual, research on task groups has shown that it plays a critical role in the group-effectiveness and member satisfaction. Effective leaders are sensitive to both the task and the process dynamics and they enlist the group in actively managing both. The bottom line is that effective leaders focus on helping group members communicate and work together, while less effective leaders tried to dominant and get their own ideas accepted. (Bolman & Deal, 1197, p. 150-151)

Decision-making processes involve complicated situations where there may not be one simple answer or decision. John Gaus points out in his work *The Ecology of Administration* (Stillman, 1996), the environment in which the decision is being made will change over the time in which the decision is being made. Therefore, one key methodology that offers defense acquisition decision makers the opportunity to become timely and efficient is to move through the decision process very quickly. To accomplish this goal of accelerating the pace of acquisition decision making, a new model for acquisition decision making needs to be developed.

Before illustrating this new model, it is important to offer a brief but important caveat to the new potential decision-making process. Any changes in the DoD acquisition decision-making process need to be made congruent with the Goldwater-Nichols DoD Reorganization Act of 1986. This act made sweeping changes in the acquisition process and these changes are still useful to the present and future decision-making process. Many of these changes emanated from the president's Blue Ribbon Commission on Defense Management, which is also known as the Packard Commission. The Commission highlighted several key characteristics, which include short, clear lines of communication among management; small staffs of highly competent professional personnel; an emphasis on innovation; and a stable environment for planning and funding (Thurman, 1988).

The Packard Commission's acquisition organization and management recommendations have been largely implemented. For example, the role and authority of the Under Secretary of Defense for Acquisition are now more firmly established (GAO/HR-95-4, 1995a). The DoD decision maker's position was established, as recommended by the Packard Commission in its report titled: A Quest for Excellence (June 1986), to provide more centralized civilian control of the weapon acquisition process by Office of the Secretary of Defense (GAO/HR-95-4, 1995a).

In April 1986, the president issued National Security Decision Directive (NSDD), which implemented the following recommendations of the commission:

> (1) The establishment of the Under Secretary of Defense for Acquisition and the designation of a Service Acquisition Executive (SAE) in each military service;
> (2) The development of a three-tiered acquisition chain of command consisting of Program Manager, Program Executive Officer, and Service Acquisition Executive;

> (3) The restructuring of the Joint Requirements Review Board, co-chaired by the Under Secretary of Defense for Acquisition and the Vice Chairman of the Joints Chiefs of Staff, to define military weapon system acquisition requirements and select programs for continuance in the acquisition decision-making process; and (4) The reduction of review layers and the number of individuals employed in the acquisition process. (DSMC, 1989, pp. 72-74)

By centralizing acquisition responsibility for the establishment of acquisition policy and the execution of program oversight under the Under Secretary of Acquisition, the Goldwater-Nichols Reorganization Act sought to strengthen the role of civilian authority in the DoD. Civilian control of the acquisition process is a complex issue with two important aspects: (1) the determination of the appropriate mix of civilian and military personnel within the acquisition process (Fox& Field, 1988) and (2) the appropriate education required for individuals assigned to DoD acquisition organizations (Fox & Field, 1988).

In concert with these issues, the DoD continues to make progress in implementing the provisions of the Defense Acquisition Workforce Improvement Act (DAWIA). The act established benchmarks for a more professional acquisition workforce by defining training and education requirements for its personnel and an acquisition career path more closely aligned to the military officer personnel and promotion system (Santo-Donato, 1992). DAWIA is designed to produce a professional acquisition workforce that is more responsible and accountable to meet program cost and schedule estimates (GAO/HR-95-4, 1995a).

Bringing Potential Commercial Practices to the DoD Decision-Making Process

A fundamental commercial practice in successful new product development and implementation is program stability (Sammet & Green, 1990). Program stability was illustrated throughout the MLRS case study and, conversely, program stability was not observed in either the B-2 bomber program or in the TRIDENT submarine case study. The MLRS was considered a success (McNaugher, 1989), while the other two acquisition programs were not necessarily examples of total acquisition successes since their initial intended total program buy was drastically reduced. The Packard Commission highlighted the importance of program stability:

> Six underlying features that typified the most successful commercial programs and that defense acquisition decision making typically differs from commercial model in almost every respect... (But that several) successful DoD programs have incorporated some or all of these management features to a greater or lesser extent. (DSMC, 1989, p. 15)

The key attributes of program stability are steadiness of purpose, a firmly established plan, reliable funding and a supportive system (DSMC, 1999). To accomplish this support the Packard Commission pointed out,

> At the outset of a commercial program, a program manager enters into a fundamental agreement or "contract" with the CEO on specifics of performance, schedule and cost. So long as a program a manager lives his this agreement, his CEO provides strong management support throughout the life of the program. This gives the program manager maximum incentives to make realistic estimates, and maximum support in achieving them. In turn, a CEO does not authorize full-scale development for a program until his board of directors is solidly behind it, prepared to fund the program fully and let the CEO run with it within the agree to funding. (DSMC, 1989, p. 19)

Senior managers in DoD are often assigned to an acquisition program for a short period of time. These periods of time can be anywhere from several months to a few years in length (Fox & Field, 1988). Thus, some of these individuals are mere transients

through defense acquisition who may never have the time to develop and articulate a clear visionary strategy for the program. One result of this rapid turnover in senior personnel is that other members of the bureaucracy (the staff) can sometimes function in the absence of clear leadership from the top management. For example, one result of this turnover of senior decision makers is that the supporting staffs, who are well informed on matters pertaining to the decision process and have longevity in their staff positions, have a growing influence upon the decision process in the institution (Fox & Field, 1988). If the staff's agenda is counter to the philosophy of the temporary senior decision maker then this can prove to become an inhibitor to the overall decision-making process. Another example of a decision inhibitor is striving for consensus within the group versus a decision from the senior leader. Committee consensus is rarely timely, especially when members handle many diverse projects on a continuing basis (Tichy & Sherman, 1993).

Improvement of the decision-making process can be attained by clearly establishing who is in charge in the decision process and then holding that person accountable for the decisions made (Soloway, 2000). The DoD acquisition regulations 5000.1 and 5134.1 clearly provide an organization structure for DoD acquisition decision making authority and provides for position labeled DAE and SAE as the top authority positions. If these positions, DAE and SAE, are to be decision-makers and are so stated that they are decision makers then they should be made individually accountable for program success and, if their decisions prove to be wrong, then the individual should be replaced.

Success in achieving greater integration of DoD and commercial practices, as with the other acquisition decision making reforms, will require overcoming institutional

culture and organizational structural barriers. The combination of a budget-driven incentives to improve effectiveness and efficiency of weapons acquisition decision making, Congressionally enacted procurement reform measures, and DoD's commitment to acquisition decision making reform are all currently present and seem to be just waiting to be implemented (GAO/HR-95-4, 1995a). Thus, the following is offered as a methodology for this change in the decision-making process to take place.

How DoD Makes Acquisition Decisions

As illustrated in the case studies' chapter, the defense establishment makes acquisition decisions based on criteria established by the current rules of federal procurement, within the boundary of the Congressionally authorized and appropriated funding levels, to satisfy military requirements established by military officials (DODD 5002.1, 1996). The strength of this decision process is found in the abilities of the participants who possess significant decision making roles in that process. The consistent personal persuasive force used by Admiral Rickover to navigate the nuclear Navy through the halls of the Pentagon and Congress demonstrates the importance a military officer can play in defense acquisition decision making. The persistent force that Seggel managed in the MLRS program for 12 years acknowledges the role of civilian government workers in the process (Schumacher & Zimmerman, 1988).

Chapter 5 illustrated that individuals drive the decision-making process. It is evident from the case studies that the vision of the dominant personalities in these programs drove the future military equipment and inventory. But what do the Public Administration scholars point out as more important, people or process?

The People in the Defense Acquisition Decision-Making Process

Many scholars have focused on how decisions are made. What comes to the forefront of their collective theory is that individuals with strong leadership characteristics actually can make any decision-making system work. As Charles Lindbloom (1959) points out, the decision-making process is iterative, in that, as more information becomes available, then a previously made decision has the "opportunity" to be "re-visited" and another more accurate or complete decision can be made reflecting this new information (Stillman, 1996). Stillman stated that people in authority are assisted in decision making by a core group of "trusted people" giving them counsel. Also, previous defense studies indicate the same conclusion: We must give acquisition personnel more authority to do their jobs. We must make it possible to do the right thing the first time and allow them to use their common sense (Institute for Defense Analysis, 1988).

The defense acquisition decision-making process is comprised of both people and process. While the process remains relatively constant, there are changes to the personnel whom are placed in positions of authority. These new people bring to the process new and different types of backgrounds and experiences. For example, some uniformed military officers have "operational" experience, having flown aircraft, driven ships, or commanded soldiers in combat; these individuals serve as technical advisors to the decision makers. Their expertise is especially useful when defining the military needs to successfully fight and win wars. There are the "acquisition types" within the uniform officer corps who have been trained and are experienced in the existing acquisition process. These individuals usually have already served in a previous acquisition position,

such as the System Program Office (SPO), or they have worked in test and evaluation at one of the many flight/ship/and tank ranges where the military operationally tests its equipment. These individuals could also be research technicians, having worked at one of the federal laboratories (GAO/NSIAD-87-36, 1987). Most of these individuals have academic degrees as a result of DoD efforts to "professionalize" the defense acquisition community (Santo-Donato, 1992).

Civilian defense workers can also include all of the above-mentioned experience. In some cases, these same civilians also have previous military experience. An example of this would be when a retired military individual joins the federal service as civilian worker (GAO/NSIAD-87-36, 1987). This civilian workforce can be further divided by separating career bureaucrats from the politically appointed civilian workers (Stillman, 1996). The career bureaucrat workforce usually has the intent of working many more years in government service than the appointed official (Fox & Field, 1988). Some of these non-appointed individuals rise through the organization structure of the defense structure to senior positions in the DoD, including membership in the Federal Senior Executive Service (Stillman, 1996). The conclusion from these observations is that there are many talented and experienced individuals already employed in the defense acquisition process (Bennett, 1974), and civilian employees tend to remain in acquisition for longer periods of time than do their military counterparts (Fox & Field, 1988).

Structure of Defense Acquisition Decision Making

The structure of the defense acquisition decision process is the organizational pathway through which decisions are made. The recurring need to properly define the

defense acquisition decision-making process is captured in the following quote from former Secretary of Defense, Frank Carlucci (1981): "The need for further study into the government acquisition process is ever present" (n.p.).

The decision process is an itinerant process whereby data are collected and shared during ensuing discussions among various decision makers. From these discussions, decision makers reach an initial conclusion as to the completeness and accuracy of the presented data. Then a conclusion is reached whether consensus can be attained as to what the data means and what further actions need to be taken. If a consensus is formed as to this next step, then a preliminary decision can be brought to the senior decision maker. It is understood by the participants that as the information changes, the senior decision maker reserves the right to revisit this decision at a later date and revise the decision as necessary. The reality of this decision-making process is that "new data" is always being found, thus previous decisions are continually being revisited (Smith, 1982). This constant "finding new data" on a regular basis, coupled with the follow-up discussions of that new data, is but one reason why the decision-making process takes a long time.

There are several other reasons why the defense acquisition takes a long time. The first reason is that the U.S. has an affinity to use highly technical weapons, and these high technology weapons take a long time to develop, test, and produce (Bennett, 1974). An example of this long time to produce the high technology is the B-2 aircraft, which took over 15 years to produce (Hallion, 1997).

Another reason for the excessive time involved in the process is the complex and changing nature of the world's security environment in which these weapons operate

(Gansler, 1995). For example, what was to be a bipolar world with forces of the East, comprised of the Soviet Union and Warsaw Pact nations facing the powers of the West, defined as the U.S. and members of the NATO, no longer can be used as the calculus for establishing security needs (Steinbruner, 1989). But why is this redefinition of state security needs of any importance to the defense acquisition decision-making process? The answer to that question is that the decision-making process needs to assess and decide as to what weapons the U.S. needs to acquire to fight all future wars (Gansler, 1995).

The methodology used to define the need for future weapons begins with the President. Through the publication of the National Security Strategy (NSS) in which the President establishes the security needs of the country (Key et al., 1998). The next document in the strategy formulation process is written by the SECDEF and is called the Defense Planning Guidance (DPG). Through the DPG, the secretary defines how the DoD will achieve the security goals previously assigned to the DoD by the President in the NSS. The DPG is written in broad and general terms; however, it does indicate the types of forces and weapon systems that will be maintained to achieve the previously defined military security requirements (McNaugher, 1989).

The chairman of the Joint Chiefs of Staff responds to the DPG by writing the Chairman's Program Assessment (CPA). This document defines how the military will structure itself to achieve those military security objectives defined in the NSS and DPG, which were written by mostly politically elected and appointed individuals (Key et al., 1998; McNaugher, 1989). Therefore, any changes to the previously stated national security strategy requires the acquisition community to respond by taking appropriate

programmatic action (i.e., initiation, termination, stretching out, or accelerating programs) to new weapon systems in the defense acquisition decision-making process.

The third reason the defense acquisition decision-making process takes a long time is that there are annual changes to the defense budget (Wildavsky, 1992). These budget changes cause frequent discussions concerning the appropriate amount of funding that Congress should allocate in support of military expenditures at the expense of domestic priorities (Wildavsky). For example, during the Vietnam War in the mid-1960s, President Johnson decided to prosecute the war without asking for any additional funding; however, "he soon faced a fiscal deficit and had to impose a special tax to pay for the war" (Spanier & Wendzel, 1996, p. 97). This political decision by Johnson allowed him the flexibility to maintain his domestic programs, labeled the "Great Society," while simultaneously fighting a war--which continued throughout his term.

President Nixon was re-elected in 1972 by promising to end the Vietnam War, which he did in January 1973. The country funded a large military budget to conclude this war (Wildavsky, 1992). The resignation of Nixon on August 8, 1974, led to a Democratic Party win in the election of 1976. President Carter came to power and reduced the defense budget (Wildavsky). With the reduced DoD funding, there was a slow down in the number of new weapon system started in the acquisition system, and those on-going programs were "slowed-down" or terminated; for example, the B-1 bomber program was cancelled (Gansler, 1989).

After 4 years of the Carter administration, there was concern that the U.S. had become a "hollow military force" (Gansler, 1989). President Reagan was elected in 1980 with the promise to make the American military strong against the perceived threat from

the Soviet Union and thus, Reagan increased the defense budget (Brown, 1983). The result of this increase in defense spending was that the defense community now had the necessary money to start many new weapon systems (Wildavsky, 1992). Since there were many new programs started or re-started (i.e., the B-1 bomber program, now labeled the B-1B, was a re-started program), all these programs were proceeding together through the decision-making process (Weidenbaum, 1992).

After Reagan increased the defense budget and spent many billions on defense-related issues, he was followed in office by his vice president, George H. Bush. Bush's 4-year term of office was marked by the use of many of the weapon systems procured by the Reagan administration during the battle against Iraq in the 1990-1991 Gulf War. However, there was a social cost to the country for the previous Reagan increase in military spending at the expense of domestic issues. In 1992, Clinton successfully won the presidential election on the motto "It's the Economy, Stupid." Clinton explained to the American voters that they would be better off if funds were again placed in domestic issues versus being invested in military programs. Clinton was able to win the presidency on this platform, and the U.S. enjoyed economic growth throughout the entire 1990s. During the Clinton administration, the U.S. successfully fought a military battle in the region of the Balkans with the equipment purchased by earlier presidential and congressional administrations (Goure, 2000).

Throughout the last 30 years, the defense budget has been continuously changed. It has been increased by one administration only to be decreased by the next administration and then increased again by yet another subsequent administration. Since the time taken in today's military procurement exceeds the time of one presidential term,

the funding profile for a major weapon system is adversely impacted by these continual fluctuations in funding priority, and the defense decision process is adversely impacted due to this change in funding (Sammet & Green, 1990). The Washington Post (2000) ran an article "Business Group Promoting Military Cuts." The article states, "As the presidential candidates gear up their campaign for the Iowa caucuses, so will a group of business executives who are promoting the out-of-fashion idea that $40 billion should be shifted from the Pentagon budget to domestic programs" (p. A6).

The source for these funds is under debate and will probably come from weapon modernization programs and will impact the ability of the nation to acquire new military hardware (Soloway, 2000). Therefore, this effort to modernize military equipment will further convolute a defense acquisition process by making the purchase of new equipment even more difficult (Holmes, 2000).

The Impact of War Efforts Also Affect the Acquisition Process

The total funding levels appropriated and authorized for the DoD never seems to be enough for all the acquisition efforts currently under way, nor for those acquisition programs that aspire to make it into the development phase of the acquisition decision-making process (Gansler, 1989). Since the "top line" amount of funds distributed to the DoD is established by Congress, any funds spent by the DoD for a specific program (i.e., the Air Force to replenish their stock of precision guided weapons) implies that less monies are available for the Army and/or Navy needs (Wildavsky, 1992). Hence, one implication is that through the use of Air Force stealth aircraft and precision guided air-delivered weapons in battles over Kosovo and Afghanistan implies that the Army and

Navy will endure added complications in the acquisition of weapons they had otherwise planned to procure. Thus, discussions of missions are important to acquisition decisions (CORM, 1995).

Recommendations

A New Model for Defense Acquisition Decision Making

This dissertation presented a review of how the DoD acquisition decision-making process operates and illustrated several decision-making theories. This next to final section, will offer a new model for the DoD acquisition decision-making process, which incorporates some of these principles of Public Administration's decision-making theory illustrated earlier and in the literature review chapter. This proposed model for defense acquisition decision making is a "composite" model that merges the current DoD acquisition process with the theories of decision making previously identified in this dissertation. An illustration of this proposed new model demonstrates the three major steps in the process, along with the three decision points still labeled as "milestones." The proposed new decision-making model is as follows:

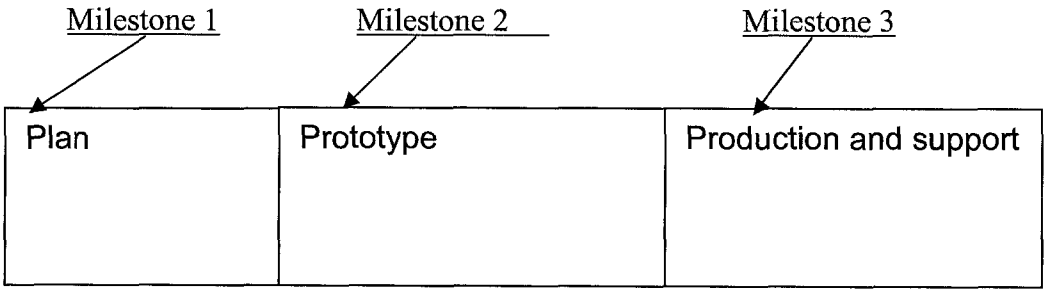

Figure 5. Three major steps in the decision-making process.

The first phase of the new decision-making process is the "plan" phase, where the initial outline on how the weapon system will perform is discussed. It is here that the exact design of the weapon system is determined; the quantity of the products; and the estimated funding, facilities, and manpower are determined. The plan phase is limited to 1 fiscal year, after which, if the program fails to proceed successfully in the decision process, the program is then terminated by DoD USD/A&T.

The second phase is the "development" phase for the weapon system. This phase builds a "prototype" of the weapon system. This prototype is given 2 years to demonstrate its utility, after which, the program proceeds to the next phase or is terminated. While the timelines to complete each phase may seem arbitrary, they are designed to motivate each service to be prudent when involved in the acquisition process and not waste the limited resources of time, personnel, and money on ideas not deemed reasonable for success. Also, it is envisioned that through this decision-making process, evolutionary changes will continue to be made on weapon system in the inventory and thus these improvements to current systems will be mere modifications to existing systems and thus less risky to produce. Also, it is envisioned that the size of the production will be less than that exhibited in the past by defense contractors. For example, gone will be the plan for 132 B-2 aircraft or 24 TRIDENT submarines. This decision process may plan for only 10 B-2 aircraft and then, if the process is successful and the threat mandates more bomber aircraft, a second production run of another 10 aircraft may be procured.

The basis for this 2-year decision cycle for the program to prove itself is Moles's law of technology development, which states that in high technology development a significant advancement is accomplished every 18 months. Ergo, if in the "prototype"

phase the technology cannot be proven, then advancements are assumed to have been made in other areas of technology development and thus another program is given the opportunity to "prove" itself to be successful in this decision-making process.

The third phase is the "production and support" phase where the actual system is manufactured as designed in the planning phase and as tested in the development phase. This phase is where the majority of the funding is spent and it is envisioned that all systems in this 3-year cycle are given "multi-year" money to acquire all weapon systems in the production phase. This use of multi-year funding is a means to establish program stability for each program in production. The acquisition process must begin to get new weapons to the armed services within 3 years of entering this phase and may not proceed past a 5-year production without the consent of USD/A&T. It is in this period that the new weapon system is supported by any needed logistical support throughout its military operational life. It is also envisioned that personnel are assigned to a program at least through the next decision phase of the new model. Thus, those individuals who are present in the "plan" phase are to remain with the program through the "prototype" phase. This change in personnel management for acquisition is an attempt to adhere to decision-making theories where people are assigned specific tasks to perform and then measured against those accomplishments.

To accomplish this new model for defense decision making requires strong leadership. Strong leaders must manage the various elements of the decision-making process to determine whether the program is to continue. Barring this support, the program should be terminated, not necessarily by the action or inaction of Congressional language or funding but by the DoD senior decision makers, in particular the USD/A&T.

It is DoD's responsibility to account for the monies that have been appropriated by Congress, and increasing the accountability for decisions by building a centralized civilian acquisition corps is the major theme for this new model. Specifically, this dissertation is recommending that a new agency be formed now to acquire all military equipment in the ACAT-1 level of funding (illustrated in Chapter 3). Also, the long-term recommendation is that at some time in the next 10 years that all military equipment be bought by this new centralized and civilian-led acquisition agency for defense acquisition.

To accomplish this new defense decision-making model the decision-makers must be cognizant of their responsibilities. There are several options for implementing a new decision-making model. These options for change are (a) making no other changes, (b) further strengthening the role of the JROC, (c) creating a unified defense acquisition organization under the direct operational control of the USD/A&T, and (d) creating a separate acquisition agency for the DoD.

How to Implement This Proposed Decision-Making Model

There can be many future avenues presented to the DoD as the possible road ahead for making changes in the defense acquisition decision-making process. Already presented is a new model to improve the defense acquisition decision-making process. The following approach outlines a methodology to systematically improve the decision process through the incorporation of this new decision-making process.

Option 1: No change to already in-place decision process. According to Smith (1982), "It can be seen that the acquisition process and procedural model are dynamic and require continual updating to remain viable in the face of change" (p. 49).

The first possible pathway is to make no change to the process and continue with the present system with all its inherent inefficiencies. This is probably the least preferred option because the time spent by the military services' infighting amongst themselves for a larger share of the budget produces an inefficient decision process. The service's tendency to argue during peacetime for a larger share of the defense budget was illustrated by Admiral Owens, "History reveals a tendency for the services to diverge rather than coalesce during periods of relative fiscal austerity" (Owens, 1994, p. 56). Since the objective is to make the decision process more efficient and effective, then destructive arguments among the services must be avoided.

Option 2: Increasing the JROC's role. "To improve needs definition, the secretary and the chairman of the JCS will charter the Joint Requirements Oversight Council to articulate requirements and validate performance" (Sammet & Greene, 1990, p. 399).

The Goldwater-Nichols Act made both the Chairman and the Vice-Chairman of the Joint Chiefs of Staff responsible for developing and implementing the joint military perspective (Gansler, 1989). The JROC, chaired by the Vice-Chairman of the Joint Chiefs of Staff, is responsible for providing alternative program recommendations and budget proposals to the Secretary of Defense (Owens, 1994). In this capacity, the JROC has emerged as a powerful force within the defense acquisition decision-making process. The

current DoD Directive on Acquisition Management (DODD 5000.2) states the role of the JROC in Part 13:

> a. The JROC shall review all deficiencies that may necessitate development of major systems prior to any decision by the Defense Acquisition Board at Milestone 0 (program start). The Joint Requirement Oversight Council shall review the validity of an identified mission need, and forward the Mission Need Statement with the Joint Requirements Oversight Council decision to the Under Secretary of Defense for Acquisition.
>
> b. The JROC shall play a continuing role in the validation of the performance goals and the baseline prior to Defense Acquisition Board reviews of major programs prior to all successive milestone reviews.
>
> c. The JROC shall review all Mission Need Statements for the joint (multiple service application) potential. (Department of Defense Instruction, 1992, p. 13-D-1)

Owens (1994) contends that the expanding role of the JROC is significant:

> JROC with the CINCs constitutes a repository of profound military insight and experience, and the rank of its members permits JROC to act as a corporate decision making body, capable of developing consensus views that transcend individual service perspectives. Articulating this joint perspective at the upper most level of military leadership has the potential of bringing about change in the decision-making process. It is a fundamental part of our response to the revolution in military affairs that confronts us today. (p. 57)

A concern about expanding the JROC, however, is whether the service chiefs can divorce themselves from their parochial service interests when participating in joint acquisition decision-making process (CORM, 1995). Since the JROC makes the decisions that set the performance requirements for all new weapons (Dillman, 1993), it would assist the decision process if the JROC reviewed all DoD programs and developed a mission-oriented roadmap that used the most appropriate weapons offered by the individual services (Sammet & Green, 1990).

By the same methodology of logic, if all the services will be using, when appropriate, the same weapon system being procured, then it makes sense to have a joint decision-making process and handle the program acquisition through a central program office.

Option 3: A unified acquisition organization.

> The concept of a centralized civilian operated weapon system acquisition agency was considered during the First and Second World War. However, all proposals for such an agency were rejected. The dominant concern then was to meet imminent threat of war without incurring the risks associated with sweeping organizational changes (DSMC, 1989, p. 6)

Donald Yockey, a previous USD/A, studied consolidation options in 1992 and rejected the concept to combine DoD acquisition under one organization because it was too cumbersome to implement (Ferrara, 1995). However, the defense environment and, specifically, the acquisition community has changed by the circumstances of reduced funding, the complexity of today's world threat, and current advancements in management and technology; therefore, another look at this concept is mandated. The fundamental basis of a unified acquisition organization is the creation of a single acquisition decision making organization directly accountable to the USD/A&T. The organization staff would be a consolidation of the existing DAE/SAE staffs. The objective of this concept would be to reduce the tendency toward parochial service unique solutions to mission needs and eliminate similar weapon systems concurrently proceeding through the acquisition process (Ferrara).

An underlying premise of this concept is that this acquisition force could be comprised predominately of civilian workers. The concept allows for military officers to

compete for staff positions but recognizes that the military personnel system must be modified to allow for longer continuity of personnel in senior positions (Defense Acquisition, 1992).

The continuity in staff management positions is found when leaders can be assigned to a program management position for 5 to 10 years and not, as the military officer currently find themselves, being routinely reassigned to another position after 24 to 36 months (GAO/NSIAD-87-36, 1987). An example of the value of this concept of "continuity of staff management" was illustrated when Seggel was the deputy MLRS manager for 12 years and the resulting success of this program.

The 1992 DoD study on Defense Consolidation infers that a consolidation of this magnitude of management staff will save resources while, at the same time, achieving a more experienced management structure through a proven and stable decision-making process. These conclusions are found in the following observation:

> Savings should result from the reduction of the duplicative overhead and oversight functions currently performed in different military department organizations and in the Office of the Secretary of Defense, as well as from the consolidation of similar program management efforts across Service lines. Additional savings in resources will be found from not having to move officers into offices on a routine and regular basis, as well as to train them once in position. A single, larger organization, due to having reached a critical mass and having the ability to focus dedicated technical teams, will have greater productivity and effectiveness than separate, and increasingly smaller organizations. (Defense Acquisition, 1992, p. 28)

While these savings promise to be significant, there are many obstacles that would need to be overcome before the implementation of this plan could be assumed. First of all, there are the political ramifications in such a change. Consolidation means reducing the number of people employed in the organization, which could bring opposition from

affected congressional constituents. Second, some statutory changes may be necessary. Currently, Title 10, U.S. Code, makes each military service Secretary directly responsible for equipping his/her own forces (CORM, 1995). This consolidation proposal makes each military service a "customer" of a centralized acquisition organization. This is already being accomplished on a small scale; for example, the Army procures ammunition for all military services (Defense Acquisition, 1992).

Option 4: Centralized civilian-led acquisition agency.

> Management and employees of companies that contract with the Defense Department assume unique and compelling obligations to the people of our Armed Forces, the American taxpayer and our nation. They must apply the highest standards of business ethics and conduct. (President's Blue Ribbon Commission on Defense Management, 1985, p. 77)

The idea of a centralized acquisition agency has been contemplated since the passing of the Defense Reorganization Act of 1958 (McNaugher, 1989). In aggressively implementing the call for more centralized control over DoD acquisition, McNamara demonstrated how difficult it is to centralize power to seek efficiency in decision making by eliminating wasteful duplication in a political system designed to prevent such a centralization of power (McNaugher). This concept is similar to the previously described unified acquisition decision making organization, except that the centralized led civilian agency would have even fewer military members making decisions. The Defense Authorization Act of 1986 tasked the GAO to develop a report on the advantages and disadvantages of a "Centralized Civilian Acquisition Agency" (CCAA; Defense Organizations, 1986). The report identified seven advantages and seven disadvantages of establishing this agency:

Advantages of a civilian agency are as follows:

- Creates a better trained corps of acquisition professional.
- Reduces the acquisition workforce and administrative layering.
- Reduces the logistics and supportability requirements by promoting the development of more common weapon systems and components.
- Establishes more uniform implementation of procurement policy among the services, as well as with multidivisional contractors.
- Reduces unnecessary turnover through rotational assignments of key personnel, thereby providing continuity to a weapon system.
- Increases early coordination and collaboration among the services in the requirements formulation phase of a weapon system.
- Improves relations with the Congress by providing a single organization, which could foster uniformity and accountability. (p. 7)

Disadvantages of a civilian agency are as follows:

- Reduces the military's influence in providing their perspective on combat tactics and combat operations.
- Makes it more difficult to discuss or reassign marginally qualified civilians in key decision making positions.
- Leaves unresolved the (1) problem of "what" weapon systems to buy and (2) problems associated with program funding instabilities.
- Creates difficulties in funding sufficient numbers of technically knowledgeable civilian personnel at the government pay rates.
- Complicates and delays the decision-making process by simply adding another layer of review at the headquarters level of decisions.
- Increases the number of government personnel because the military services may have to retain a staff to monitor the new agency.
- Creates a severe management challenge because of the large size of the agency. (p. 7)

The main concern with a completely civilian acquisition organization is that it could remove the military "war-fighter" or weapon "user" from the acquisition process. The literature review has demonstrated that communication with the user (military membership) is needed in the (acquisition community) decision-making process. The military officer contribution during the acquisition decision-making process lends credibility to the specific military utility for the proposed weapon system (CORM, 1995). The case studies illustrate that the military is especially needed during the "determining of system requirements" stage of the decision-making process. It is preferable to place these selected military members in some key advisory position to assure that this "requirement" is attained during the decision process. The rationale for this conclusion is there is no substitute for first-hand, military experience in DoD acquisition decision making professionals (Defense Organizations, 1986). This concept supports Stillman's (1996) theme of using "trusted people" assisting senior decision- makers in the decision process.

Option 5: Defense acquisition support organization.

> The national security of the United states will in the end depend on whether the industrialized democracies are able to sustain their military, political and economic strength postponing present consumption as necessary, even during difficult economic times. (Brown, 1983, p. xiii)

This final option makes a case for consolidating only the functional areas supporting the defense acquisition decision-making process. The concept, known as the Defense Acquisition Support Organization (DASO), would establish a centrally managed organization providing technical support services for all acquisition decision making

program management offices in the DoD (Bennett, 1974). Initially the organization would align the following support functions: contract management, contracting, financial management, auditing, legal support, and industrial property management. Functional areas for future consideration would include foreign military sales management, manufacturing, production, engineering, test and evaluation, research and technology management, and engineering design (Ferrara, 1995).

This proposed organization could emulate either the Defense Contract Management Command (DCMC), which was developed in 1990, or reflect the Defense Logistics Agency (DLA). DCMC centrally manages contract administration services for all DoD acquisition activities. DLA has five logistics systems, one for each service. DLA stocks and manages the $12 billion inventory of fuel, clothing, food, and other "consumable" supplies and repair parts used by all military services (CORM, 1995). DASO would expand this concept to other functional areas and would support all acquisition decisions made in the DoD (Ferrara, 1995).

A Proposed Methodology to Incorporate These Five Possible Options

> The Administrative power in the United States presents nothing either centralized or hierarchical in its constitution; this accounts for its passing is unperceived. The power exists, but its representative is no where to be seen. (De Tocqueville as cited in Heffner, 1956, p. 45)

Making just a few minor changes to the acquisition decision-making process might temporarily improve the process, but it would do nothing to take defense acquisition into the next century by incorporating the theories of decision making illustrated in the literature review. Increasing the JROC role would considerably enhance

the requirement process but might meet resistance from the individual military services, as no one service or agency would be specifically placed in charge of the overall process, hence accountability for the decisions made is lost. A defense support organization set-up to assist rather then make decision is redundant to the current decision-making process and is rejected as a viable solution when viewed through the lens of decision-making theory. A unified acquisition organization could generate military service opposition during the decision-making process, since individual military service needs could become subordinate to "joint" needs. However, when the acquisition community is viewed in the macro sense, with the future likely to contain fewer military uniform members and a limited number of new but very expensive military procurements, a need for a new method for defense acquisition makes logical sense. To accomplish this necessary change of institutional cultural, it is the recommendation of this dissertation to form a civilian led defense acquisition agency to acquire all U.S. major weapon systems. The following is the preferred methodology to incorporate this recommendation into the defense decision process.

First, the DoD must be proactive and initiate the first stages of change; however, changing the system too quickly could have counter-productive results due to the inherent resistance by such a large institution as the DoD to change of any kind. The initial steps should be directed toward the requirements phase of the defense department's acquisition process. The specific recommendation is to empower the JROC with the sole responsibility for determining what are all weapon system requirements. Thus the services must seek JROC approval before any acquisition programs are initiated. This

action should remove duplicative programs from the planning phase of the acquisition cycle.

The second step involves the consolidation of the support functions of all defense agencies under one DoD office. A DoD office should be established for the financial management, auditing, legal support, and other functional specialties for all defense agencies. The successful completion of this phase is the foundation for the consolidation of the entire defense acquisition community's decision-making process.

Two different options are possible for phase three. These options are dependent on the force management strategy that would be adopted by the military services in the near future. If the Army, Navy, and Air Force continue downsizing their force structure to solely utilize personnel as part of "operational" forces, then the natural choice would be the creation of a centralized civilian acquisition agency; however, if the Services still retain a sizeable mixed organization, both military and civilian officers, in any support function, then proceeding with a unified acquisition organization comprised of both military and civilian officials is the appropriate next choice. This approach supports Stillman's (1996) concept of the value of using a core of fully trained professional bureaucrats to run public institutions.

The fourth and final phase would be the creation of a centralized civilian led decision-making acquisition organization, which is the over-arching recommendation of this study. A centralized civilian acquisition agency brings together all the benefits evidenced in the literature review: a great degree of continuity, longevity of service, and proven expertise to the acquisition decision-making process. A centralized civilian led agency of experienced and trained individuals to procure all defense weapon systems is

also the best means to develop a better communication process with Congress, which could then improve the stability of the defense funding. This concept of a civilian DoD acquisition work force could be modeled from the current British and French defense acquisition agencies, which exhibits some of these structural similarities. This is depicted in the following diagram:

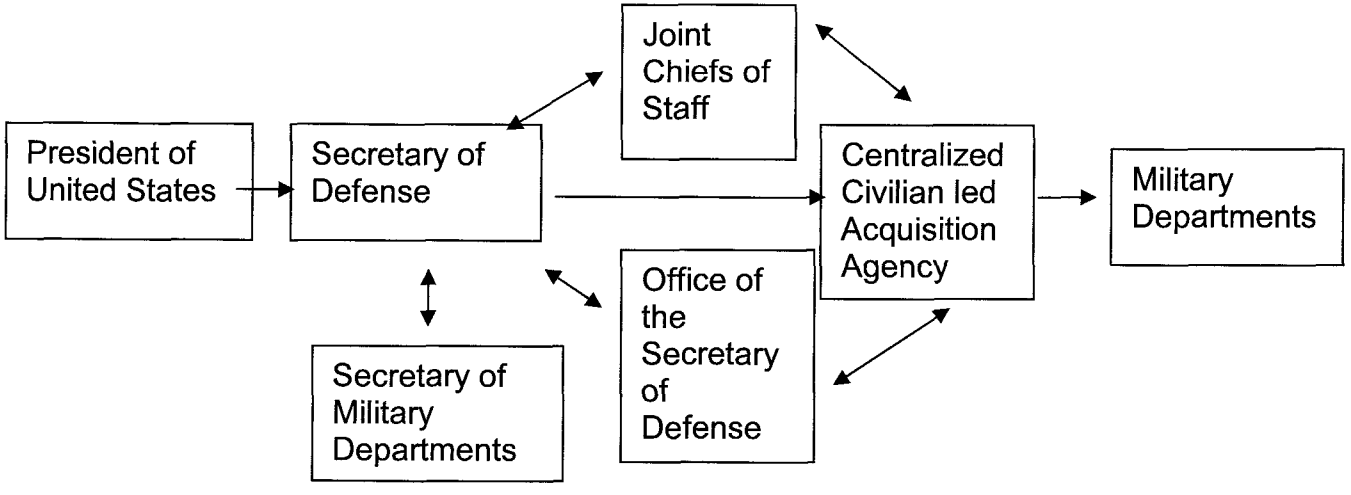

Figure 6. Diagram of a civilian DoD acquisition workforce.

Future Studies

How Defense Acquisition Decisions Are Made Elsewhere

In the summer of 1988, the House Armed Services Committee (HASC) began a series of hearings on the defense acquisition process. These congressional hearings were, in part, sparked by the Federal Bureau of Investigation's probe into criminal activity in the acquisition community at the Pentagon, which was then labeled as the "Operation Ill Wind" investigation. These criminal activities included defense contractors falsely inflating costs of sensitive military aircraft and naval shipping equipment (http://www.fbi.gov.programs/fc/video_test/gf_txt.htm, p. 1). In early 1989, these congressional hearings were expanded to include a systematic study of British and French defense acquisition processes. The British and French systems were selected for review for three important reasons:

> (1) they were both using a centralized acquisition decision-making process, which was quite different from the decision-making system employed in the United States; (2) they had reorganized their acquisition decision architecture into a formal structure with its own set of rules, regulations and customs; and (3) these countries were Allies with the United States and therefore adequate information would be available from them from which to complete this research. (Subcommittee on Investigations, 1989, p. 1)

These two European defense acquisition systems contained independent acquisition agencies where all decisions were made and contained in a central finance office through which the planning, programming, and budgeting were financed (Subcommittee on Investigations, 1989).

Jacques Gansler (Gansler & Henning, 1988) conducted a similar study of these same countries and brought similar conclusions to the congressional committee. First of all, when measured in today's dollars, the U.S. procures at least six to seven times the

quantity of the French and British military weapon systems combined (Subcommittee on Investigations of the Committee on the Armed Services, 1989). Therefore, a centralized U.S. acquisition decision organization that would be similar to the British and French model would be considerably larger than its British and French counterparts. Secondly, the U.S. focuses on the procurement of more advanced technologies in their new weapon systems, whereas the British and French incorporate more mature technologies into their existing weapon systems (Subcommittee on Investigations of the Committee on the Armed Services). The British and French therefore limit significant risk during the weapon development phase of the decision process and thus do not need as many analysts as an American system would prefer.

The British and French have demonstrated that they are more willing to export their front line weapons to other countries (Subcommittee on Investigations of the Committee on the Armed Services, 1989). These countries hold the view that arms sales are a method to recoup some costs in research and development, create jobs for the domestic economy and keep the balance of payments in check (Subcommittee on Investigations of the Committee on the Armed Services). Thus, the process of exporting their "front-line military inventory" allows more flexibility for their acquisition decision makers because the costs of the weapon system are not born strictly through the domestic economy.

The British and the French also have a centralized budget office that resides within their Ministries of Defense. These organizations are manned with only career civilians who are cognizant of the overall government plan for the future of military capabilities and develop the annual budget with this information. Although budgeting is

done on an annual basis, both the French and the British systems tend to concentrate on their long-term plans (Subcommittee on Investigations of the Committee on the Armed Services, 1989). The French codify their acquisition programs financial plan into law, which allows them to maintain a more stable defense budget environment (Subcommittee on Investigations of the Committee on the Armed Services).

The acquisition management process as exhibited by these countries also differs from that of the U.S. in several other ways. First of all, the French and British spend a greater percentage of their acquisition costs earlier in the acquisition cycle of the developing weapon system, where they establish with more detail what capabilities the weapon system will possess (Subcommittee on Investigations of the Committee on the Armed Services). Therefore, many more long-term decisions must be made and committed to earlier in the program life cycle of French and British weapon systems than in the American acquisition decision-making process. The impact of this is that there is a larger "sunk cost" earlier in the French and British weapon systems than in the same timeframe of the American decision process. The French and the British spend more time and money evaluating proposals than do the Americans to ensure that the design of the weapon system truly meets their current and future military service needs as well as fits their proposed budget constraints. After a production decision is made, there are very few changes during the production program. The final distinction has to do with French acquisition professionalism. The French have a cadre of engineers in their Armaments Directorate and these engineers can become program mangers or serve in senior acquisition positions only after completing an intense, 7-year, government-sponsored training program. The entrance examination for this program is extremely difficult, so

only the very top engineers are even chosen to compete for a position (Subcommittee on Investigations of the Committee on the Armed Services, 1989). These workers then provide the acquisition community with expert acquisition professionals possessing engineering, management, and decision-making skills. Since this is considered a very prestigious occupation, the individuals tend to remain in their jobs for longer periods of time; hence this French approach also provides a continuity of workers who remain throughout the entire acquisition process of major weapon systems. One interesting note is that these armaments engineers/program managers also belong to a "fourth service" called the DGA--French Procurement Agency (Boulesteix, 2001) and is not considered subordinate to their Army, Navy, and/or Air Force.

The final and, also compelling, reason for choosing France and England as a topic for further study in defense acquisition decision making is that both of these countries would make excellent places to visit and conduct additional research.

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