

AD-A129 135

THE MILITARY PROCUREMENT SYSTEM--CAN IT BE IMPROVED?
(U) ARMY WAR COLL CARLISLE BARRACKS PA J DEGRANDE
03 MAY 83

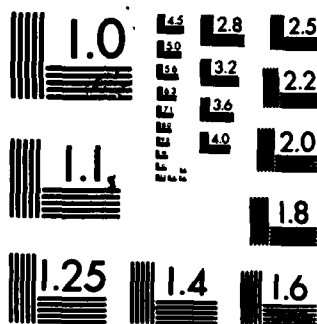
1/1

UNCLASSIFIED

F/G 15/5

NL

END
DATE
FILMED
DTIC



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

The views expressed in this paper are those of the author and do not necessarily reflect the views of the Department of Defense or any of its agencies. This document may not be released for open publication until it has been cleared by the appropriate military service or government agency.

**THE MILITARY PROCUREMENT SYSTEM—
CAN IT BE IMPROVED?**

BY

**JOE DEGRANDE, JR.
LIEUTENANT COLONEL, UNITED STATES AIR FORCE**

AD A129135

FILE COPY

3 MAY 1963

DTIC

JUN 1 0 1963

US ARMY WAR COLLEGE, COLEGE PARK, MD 20742

88 06 10 034

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) The Military Procurement System--Can It Be Improved?		5. TYPE OF REPORT & PERIOD COVERED Study Project
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Lieutenant Colonel Joe DeGrande, Jr.		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS US Army War College Carlisle Barracks, PA 17013		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE 3 May 1983
		13. NUMBER OF PAGES 35
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The military procurement system is under increasing pressure to reduce inefficiencies to get more capability for the dollar. Under constant pressure from the Congress and the media, the system has to date failed to meet expectations. Examples of cost overruns, underestimating of new item costs, and mismanagement continue to surface and be used for political as well as profit purposes. Before the process can be improved, the actual causes of problems must be		

DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 65 IS OBSOLETE

Item 20 - continued.

Identified and solutions must be offered to fix the system that will not have negative impacts in other areas. To this purpose, research and interviews were conducted to identify known problems, consolidate causes in categories and to identify solutions that had been proven successful in the past. This effort will hopefully serve two purposes. First, those in positions of responsibility will be inspired to improve the system within their respective areas and secondly, our followers in the procurement system will not have to continually rediscover the problems and reinvent solutions.

Approved for public release
Distribution unlimited

The views expressed in this paper are those of the author and do not necessarily reflect the views of the Department of Defense or any of its agencies. This document may not be released for open publication until it has been cleared by the appropriate military service or government agency.

USAWC MILITARY STUDIES PROGRAM

THE MILITARY PROCUREMENT SYSTEM--CAN IT BE IMPROVED?

INDIVIDUAL STUDY PROJECT

by

Lieutenant Colonel Joe DeGrande, Jr.
United States Air Force

US Army War College
Carlisle Barracks, Pennsylvania 17013
3 May 1983



Approved for public release
distribution unlimited.

ADDITIONAL
NTIS CLASS
DIL
Unpublished
Justification
By
Distribution
Availability Codes
1
A

ABSTRACT

AUTHOR: Joe DeGrande, LTC, USAF

TITLE: The Military Procurement System--Can It Be Improved?

FORMAT: Individual Study Project

DATE: 3 May 1983 PAGES: 35 CLASSIFICATION: Unclassified

The military procurement system is under increasing pressure to reduce inefficiencies to get more capability for the dollar. Under constant pressure from the Congress and the media, the system has to date failed to meet expectations. Examples of cost overruns, underestimating of new item costs, and mismanagement continue to surface and be used for political as well as profit purposes.

Before the process can be improved, the actual causes of problems must be identified and solutions must be offered to fix the system that will not have negative impacts in other areas. To this purpose, research and interviews were conducted to identify known problems, consolidate causes in categories and to identify solutions that had been proven successful in the past. This effort will hopefully serve two purposes. First, those in positions of responsibility will be inspired to improve the system within their respective areas and secondly, our followers in the procurement system will not have to continually rediscover the problems and reinvent solutions.

PREFACE

This Individual Study Project was produced under the aegis of the US Army War College Department of Command and Management. The scope and general methodology were outlined by the Department. The study was undertaken to offer personnel in the military procurement system and in particular those in the Air Force programming business, a perspective of the system as seen by the author and others previously associated with the system.

TABLE OF CONTENTS

	Page
ABSTRACT	ii
PREFACE.	iii
INTRODUCTION	1
DISCUSSION	1
CONCLUSION	26
RECOMMENDATIONS.	27
SUMMARY.	33
DISTRIBUTION	35

INTRODUCTION

The original purpose of this study was to seek and explore new avenues that could lead to an improvement in the military procurement process. However, after interviews with two general officers that are extremely knowledgeable on the subject, and after reviewing numerous articles, reports and books, the conclusion was reached that new approaches were not necessary because time-proven solutions to military procurement problems were available. The purpose of this study then became to resurface and highlight problems associated with military procurement as identified by internal and external sources and circulate the results so that others do not have to continually rediscover the problems and reinvent solutions. A secondary but important purpose of the study is to remind those in influential positions of their obligation and duty to make the military procurement system as efficient as practicable.

DISCUSSION

With that introduction, just what is the real problem and why must we be concerned about military procurement practices? In fact is there really a problem or is the system functioning as well as it possibly can?

An article in the March 7, 1983 issue of Time titled, "The Winds of Reform" illustrates how the press, the Congress and possibly the public sees the military and how we are using the tax dollars provided. As one of six examples of procurement cost increases the article points out:

In 1951, 6,300 fighter planes were funded by the military at a cost in 1983 dollars of \$7 billion. The US is now spending \$11 billion to build only 322 planes, 95% fewer than in 1951.

The article goes on to discuss an appraisal of the defense procurement process by Franklin Spinney, a defense analyst working for OASD/PA&E.

The crux of Spinney's analysis, titled The Plans/Reality Mismatch, is that the administration's \$1.6 trillion military build-up (which would amount to \$20,000 for each US household over the next five years) is likely to be underfunded by as much as 30%. This means that unless major new weapons are eliminated or other drastic changes made, the final bill may be \$500 billion more than expected. The latest findings are a sequel to a 1980 Spinney report, Defense Facts of Life, which argued that the pursuit of complex technology has resulted in the production of weapons that are high in cost, few in number and questionable in effectiveness.

With this type of ammunition from within the Department of Defense, the military reformers comprised of Senators, Congressmen, "independent" research groups and analysts such as Spinney, have received more attention recently and are having a definite impact on formulating and finalizing the military budget. This group and others, have severely criticized the defense establishment for waste and mismanagement and failure to properly assess the capability of new systems before entering production contracts. Under a separate title, "Gold-Plated Weapons,"² the same Time Magazine continues with the attack on the procurement system.

The stunning costs of loading weapons systems with the latest in sophisticated technology and the long production delays that result from endless 'improvement,' might be tolerable if US military forces in the end were equipped with the very finest weapons, or at least ones that could do the job. But all too often the gold-plated armaments bring embarrassingly small improvements in fighting capability. Sometimes, in fact, older, simpler and vastly cheaper weapons work as well or better.

This article goes on to cite four specific examples, one of which discusses the B-1B.

Much of the debate about the B-1B intercontinental bomber revolves around price: will the 100 new bombers that the Air Force wants to buy cost \$200 million each, as the Pentagon figures, \$285 million each, as a team of retired generals who studied Air Force procurement guesses, some figure in between or possibly something even higher? But there is another, at least equally troubling, question: will the most expensive plane ever built--and the B-1B will be that by anyone's estimate--do a

significantly better job of penetrating Soviet air defenses in case of nuclear war than the aging (20 years and up) but still quite serviceable B-52s they will replace?

Too many of the test data are still secret for a definitive answer to be given, but some experts who have seen the results are gravely worried. They say the B-1B has poor acceleration and little maneuverability ('worse than the B-52,' charges one critic) and that its range is less than the 7,455 miles planned. One objection to the B-52s is that because of their age it is getting increasingly difficult to keep them ready for combat. But early data indicates that the B-1B, because of its complexity, also would face severe maintenance problems. The Air Force contends that the B-52 presents too broad a 'cross section' for Soviet radar. Critics doubt that the B-1B design will fool Soviet radar either. Worse, they charge, the B-1B's own terrain-following radar, which it uses to navigate to the target, will send out what amounts to a beacon that enemy fighters and missiles can home in on. The doubters concede the B-1B's advanced avionics gear will do a better job of jamming Soviet radar, but add that the same avionics could be put aboard B-52s at a small cost. In sum, whatever edge the B-1B might have over the B-52 would be purchased at an exorbitant cost for a few years between 1985, when large scale deliveries would begin, and the early 1990s, when an all-new stealth bomber could be available.

This indictment of the military procurement system in a respected magazine with a rather large circulation is evidence of the mistrust that exists with the press, the Congress and the public at large of the ability of the military and the Department of Defense to prudently manage the very large defense budget. It is very evident, that even those that are most sympathetic to the need for more emphasis on defense cannot defend a system for very long that is obviously inefficient to the point of being wasteful.

This Time article also points out several other factors that influence the military procurement practices and also cites many examples of what could be called imprudent decisions on what is bought to meet this nation's arsenal requirements. One of the strongest influences on the military procurement system is congressional pressure. For example, the Senate voted to cancel A-10 procurement in the FY83 budget and use the funding made available to buy F-16s. (The Air Force favored this decision.) The chairman of the Senate Armed Services Committee was Senator John Tower of

Texas, which incidentally is where General Dynamics builds the F-16. The House Defense Appropriations Subcommittee, chaired by Joseph Addabbo of New York, voted to continue to buy A-10s because Fairchild-Republic, builder of the A-10, has a large factory on Long Island which is directly involved with producing A-10s. The conflict was resolved when the White House supported Addabbo because of the Long Island vote. The Air Force was directed to buy 20 A-10s in FY 83. "At this inefficient production rate, the price of the plane (A-10) has jumped from \$5.9 million apiece in 1975 to \$18 million (more than an F-16) in 1983."¹

Efforts to ensure the latest technology is incorporated in a weapon system is a significant factor in increased costs and cost overruns. These efforts also cause production delays which add to the cost. Some sources have estimated that only a very small increase in performance can drive the cost of a system up by as much as 50 percent.

There is also a concern that the military leadership is involved in some sort of incestuous relationship with defense contractors. There has been reference to the "revolving door" that permits top military leadership to go to work for the same defense contractors they had dealings with upon retirement or separation from the service. Some also point out that military project officers are promoted and advanced by driving a new system to fielding but no recognition is ever given for successfully "killing" an upcoming system. This relationship between the military and defense contractors permits continuation of practices that condone initial low cost estimates and follow-on cost increases after development/procurement of a system is approved.

In a similar view, reformers have argued that fewer than 10 percent of defense contracts for weapons are let on a stringent competitive basis.

Because of this, defense contractors are not prone to produce on a most efficient basis because their profit percentage is almost guaranteed. There is then very little incentive to limit overhead costs to meet competitive production costs.

A root cause of weapons waste in the US is the absence of clear guidance from the top about where and how America should be prepared to fight. There has been little good to say about so called strategies portrayed in the yearly Defense Guidance and the ability of military planners to effectively develop plans to implement those strategies. Many would proclaim that the policies layed out are strictly procurement strategies designed solely to defend or reinforce current procurement practices.²

The preceding examples of how the press, at least, views the military procurement system is at the very minimum, an indication that perhaps there is need to review our current practices and methods to see if there is a better way. We must present a better argument and more precise justification for new and continued procurement of weapons and guarantee that the nation is getting the best military available for the dollars spent. In short we must refrain from:

1. Continual cost increases and cost overruns,
2. underfunding of projects, particularly in the non-budget years, and without question we must not even be suspected of
3. waste and mismanagement.

In addition we have to be more selective in what and how we procure. For example, the quality/quantity or simple vs. high-technology system argument must be carefully analyzed before any new system is procured or before an existing system is upgraded. The tendency to add just a little more capability must be resisted. And finally, and perhaps the most difficult task is to reduce the pork-barrell influence of Senators and Representatives that hold influential positions. This means that our procurement practices

must be defensible without question and efforts to change these practices for personal gain will meet with severe ridicule from the public and the press.

Without a firm grasp of what we are doing correctly it is difficult to analyze how deeply our problems are rooted and to what extent we can alter practices to correct them. With this purpose in mind and also with the expressed intent of getting the view from the inside to balance the external view, an interview was conducted with two general officers that have had very recent and very detailed dealings with the Air Force Program Objective Memorandum (POM), the budget and the system that develops and produces the substantiating documentation for these two very important products. These generals are Major General Charles F. Cunningham, Director of Air Force Programs and Evaluation and Lieutenant General Charles A. Blanton (Ret), former Deputy Chief of Staff for Programs and Evaluation.

Procurement questions were given to Major General Cunningham first. "Sir, regarding the Air Force procurement practices, what are we doing right and if we are making mistakes, how can we correct them?"³

Major General Cunningham. What's right! We start from the threat and design a strategy from which we determine a force structure that will enable us to carry out that strategy. We then use that rationale to defend that procurement with DOD and the Congress. In my opinion, that is a very sound approach although it is not as sophisticated as it should be and that brings us to what is wrong.

The first thing that should concern us is the perception of those that grade our procurement practices: OSD, the Congress, the Administration and the media. The media--make no mistake about it--forms public opinion and therefore is very influential. In specific terms, the media and therefore the man in the street is now grading our procurement practices. (Who

influences these people?) The vendors (defense contractors) play a big role as do the advocates in uniform who work in cooperation with the vendors for a share of the defense budget. The vendors do not necessarily work or track to a plan as military programmers do, but make every attempt to influence what and how many are bought by the services with all available means to include advertisements, lobbying, and direct contact with OSD analysts, congressional staffers and influential individuals in the administration.

Secondly, the simple thought of threat-strategy-budget gets confusing in the complexity of operating in a free enterprise system where the allocation of dollars is highly dependent on the political advantage that can be gained from that allocation. The political influence on procurement and the political value of procurement decisions are prime reasons why the best laid plans of military budget builders go astray. Recent case studies that point out this fact include: (1) The cancellation of the B-1 by then President Carter; (2) the PBD 700 that ordered the procurement of the C5 despite the fact that a source selection had been completed for the C-17; (3) the continued congressional pressure and direction to buy A-10s beyond the point which the Air Force had established a requirement; (4) the political pressure from within DOD to procure the A-10 originally; and (5) pressures to buy the A-10 engine from off the shelf and subsequent problems involving cost and performance goals.

The budget process itself brings out a third concern and that is the very subjective decision on the allocation of funds. It is not a simple process to determine how dollars should be apportioned between research and development, procurement, readiness, sustainability, munitions, and force structure. The major commands provide a great deal of assistance in this

determination but we find because of fiscal constraints that the using commands tend to have insatiable appetites for systems and force structure. The major commanders also influence the process because of the personal power they possess and their input can provide leverage that may not be in the best interests of the total force.

There are others that unduly influence the military budgets. The program and budget analysts in OSD and congressional staffers are not directly accountable for their actions and some can influence decisions on a program without regard to the actual program merits. These people also have two shots at changing a program--first by influencing the military or DOD to change the budget on the front end and secondly by influencing the congressional committees during the budget marking process.

With what I have previously mentioned what are the controllable factors and how can we fix what is wrong? The military has been criticized for not pricing its programs properly. Mr. Spinney has been in the news and presented briefings to congressional committees despite the objections of Mr. Chu, Spinney's boss and Director of Program Analysis and Evaluation in the Office of the Secretary of Defense. Mr. Spinney implies that he has done regression analysis on a large number of systems and has found the Air Force and Navy to consistently underprice their programs. Although this allegation may overstate the degree to which programs are underpriced there is justification to reexamine our pricing practices. Senator Tower, Chairman of the Senate Armed Services Committee, states that we ought to reprice the outyears of the budget. Repricing upwards, however, tends to be a self-fulfilling prophecy so we must be very careful about adding costs without sufficient justification. Another method of controlling costs is to pressure companies to operate in a more ethical manner when they are

developing and producing articles that take advantage of the latest technology. An example would be the Pratt & Whitney Company that produces the F100 engine for the F-15 and F-16. The pricing dictated by that company and the changes on engine specifications and the required corrections that have had to be made is a real horror story for the Air Force.

If we can price more accurately, another way we can fix the procurement problems is to resist the temptation to put more in our budget every year than we can afford. Of course, we scrub the budget year intensely to insure we don't do that, but we always put more in the outyears than we have funding for and therefore we have financing problems and difficult prioritization decisions to make even before we get the inevitable changes to fiscal guidance and directions to apply funds already identified for a program to an alternate program.

The above problem results from the perception that the budget process is a game and we the Air Force, game the process from the major commands, through the headquarters and right on to OSD, OMB, the Congress and the Executive Branch. Those same people outside of the Air Force play the game right back at us--like unrequested Air National Guard procurement of C-130s and A-7s directed by the Congress. Internal discipline is needed before we can reduce this gamesmanship from both directions. Discipline is needed in determining requirements, in the pricing process and in acknowledging the value of new ideas such as the Carlucci initiatives (very good ideas but some were not practicable within the current system). We also need the discipline to avoid chartering (and paying dearly for) study groups and consultants to provide us with conventional wisdom that we already know.

The entire Defense Department also must be more aware of how the state of the nation's economy influences political decisions concerning military forces and requests to the Congress must be more economically responsible.

Up to now, we haven't been very good in this regard. Our economic assumptions: GNP, inflation rates, interest rates, etc., have always been optimistic and exacerbate the pressure on underpriced programs.

Defense industry also plays a role in the total defense equation and are responsible for some of the difficulties. Pressures from the Hill and from the media are largely generated by an industry which preys on the services who themselves are sometimes suckers for the "hottest biscuit." Evidence to this fact is illustrated in the area of aircraft configuration control where we have constant changes taking place on the production line and a modification bill that has grown to an outrageous size.

In summary, I think we are doing a respectable job considering the system that is indicative of a free-enterprise society and where we have an important and very influential Congress. My recommendations would include the following: (1) work the best procurement strategy on a case by case basis in recognition of the peculiarities of each individual system; and (2) lean towards simpler, less sophisticated systems but do not disregard the value of high-tech systems to do the things that must be done.

Lieutenant General Blanton (Ret)⁴ offered a similar view but from a slightly different perspective. General Blanton served for 13 straight years in the Pentagon and his jobs included those as Director of Budget, Director of Legislative Liaison and Deputy Chief of Staff, Programs and Evaluation. In these jobs in particular, he was directly involved in high level Air Force procurement decisions and has firsthand knowledge of such controversial subjects as MX basing, C-5 vs C-17 and A-10 vs A-7.

Lieutenant General Blanton. From a historical perspective, many things have been tried to correct or change the procurement system and some have failed miserably. Robert McNamara, as Secretary of Defense, was

probably the biggest failure in the history of defense procurement because he tried to do it all himself. He attempted, in his own style of centralized leadership, to make many decisions on subjects and in areas where he had little, if any knowledge. An example of a glaring failure would be the TFX (F-111) aircraft that was to be the ultimate and do all things for all users in the Air Force and the Navy. The M/D/S (model, design, series) which included the F-111A, B, C and D models were miserable failures.

McNamara attempted to force the Navy to buy the aircraft during this period and therefore commonality requirements drove the cost up and performance down. After the Navy dropped from the picture, the Air Force developed the E and F models of the F-111 which have met all expectations and have proven to be very capable aircraft to perform the missions they were designed for.

An example of good procurement practice is the Maverick missile.

Under the package procurement concept the Air Force bought large quantities of Mavericks with the design specifications pretty well frozen. The missiles were produced over a period of time with a fixed price clause in the contract (a fixed priced incentive fee contract). Hughes actually took a large loss on the first 25,000 Mavericks because inflation exceeded predictions and there was not an escalation clause in the contract.

A new euphemism for package procurement is multi-year buy. Multi-year procurement will work well for a system with a long production run and for which the design parameters are pretty well fixed. A high volume production run over a period of time will permit a contractor to buy materials in quantity and get quantity discounts. Other advantages of multi-year procurement include: (1) the reduction of political pressure on a yearly basis; (2) the Air Force and the contractor can focus on building a product as efficiently as possible; and (3) the production process is stabilized

due to an almost guaranteed, determinate production run. The F-15 and F-16 multi-year programs are examples that should prove to be resounding successes.

On balance, there has been significant improvement in the procurement process through the multi-year buy. Another factor that has aided the process is this Administration's recognition of the need to simplify the DSARC process with all of the associated milestones. The reduction of the milestones and attempts to decentralize the decision making process on a greater number of systems have been moves in the right direction. These two actions have put the responsibility for decision making on the Service Secretary and the Chief where it rightfully belongs. The process and associated problems therefore become very personal and an individual is held accountable rather than the bureaucracy. An additional benefit of the milestone reduction, is a reduction of meetings in Washington at which the program director must attend. The program director now has more time to devote to his program.

A major problem area associated with the current procurement process is the political involvement. There is little doubt that the recent C-5 procurement decision was a political one. The decision had nothing to do with the fact that the C-17 was a better airplane than the C-5. The C-17 was designed to meet the Air Force needs for inter-theater as well as the intra-theater airlift and carry outsized cargo as well. The C-17 also had cost advantages on the C-5.

Why then was the C-5 selected after source selection for the C-17 had already been completed? I believe the C-5 decision reflects the administration's attempt to placate the southern democrats and avoid hostilities that would arise if California was given another major defense program. The B-1 program and many large classified programs were already in California and the C-17 would have been built there also. The C-5 offered the

opportunity to please Senators Nunn and Stennis and give the indication that the administration would spread the wealth with the proposed increased defense spending. The TFX (F-111) decision was similar to this one as General Dynamics needed support to stay viable and because of the incumbent, Texas business was of great concern to Washington.

The Air Force system on balance is a reasonably good one. The process is a logical one--identify operational requirements and then try to meet those requirements within the bounds of technology and the imposed fiscal limits. Only the systems that are forced upon us by political pressures tend not to be well done because they don't evolve from a refined requirements process. Examples of sound systems that have evolved properly include the F-15 and F-16 which will meet operational requirements through the year 2000. The B-1 should also prove to be an excellent system as will the follow-on ATB. A major shortcoming in this process however, is our inherent inability to determine and justify proper force mixes within our total force structure.

Although the 30mm gun and the Maverick missile have worked out well for the Air Force, the carrier of these systems is another matter. The A-10 was a political airplane forced on the Air Force by DOD. The Air Force was given the option of buying the A-10 or getting nothing at all. In exchange for procuring the A-10, the Air Force was given the opportunity to develop a follow-on fighter.

Another factor in the selection of the A-10 was the economic situation in the Northeast US. Unemployment was very high and therefore, production of the A-10 in the New York/Maryland Fairchild factories would do much to improve this situation. Political pressure was brought to bear to do just that.

The Air Force would most likely not have built the A-10 given a choice. The performance characteristics of the A-10 were just not suitable for the missions that were envisioned. In order to operate effectively, the aircraft should have better acceleration and be capable of sustaining higher speeds while operating at low altitude and under the weather when necessary.

Due to the professionalism of our aircrews and innovative tactics, a marginal aircraft (A-10) will fit nicely into a fighter force structure composed of F-15s, F-16s and A-10s in the 1980s. There will be situations in future conflicts where we will be flying in good weather, opposed by moderate defenses and attacking armor. In this situation the A-10 should be very effective.

Probably our worst procurement record is in the area of spares and munitions. Follow-on logistic support for an aircraft in production has been absolutely terrible. The estimating process that determines spares and spare requirements is yet in the dark ages. For example, every year for the past 10 years has seen an underestimation of the follow-on spares requirement by Air Force Logistics Command (AFLC). In every Program Objective Memorandum for these 10 years, the Air Force has funded to zero out the backlog only to discover by budget submission time that the backlog was increasing rather than decreasing.

The estimating process most certainly must be improved. We have seen a consistent error magnitude of 300 to 400 percent associated with spares requirements to support aircraft in the field. It is apparent that personnel responsible for this task are not technically competent. In AFLC, people that came up in the logistics business as clerks, have over time been promoted into positions of leadership and responsibility which includes decision making concerning spares estimating.

Another problem in the logistics estimation is the computer support. Upgrade of the AFLC system has been prostituted and delayed by an influential Congressman. AFLC had made a decision several years ago to develop a new management system called ALS (Automated Logistics Support) and buy new computer hardware to go with it. Congress denied the new computer to the Air Force despite the facts that demonstrated an obvious need for new hardware. Therefore, AFLC continues to buy and stock the wrong items and has difficulty determining what are adequate spare quantities to support the operating fleet. The procurement people then remain on a treadmill, behind the power curve in meeting the needs of the field. The resulting system is a reaction to events rather than a planning process and therefore procedures and actions are never timely.

We also have many inexperienced, improperly trained/positioned personnel in the procurement business. These people in many cases lack the technical skills necessary to do their jobs competently. Overwhelmingly, billions of dollars have been wasted by improper procurement practices such as buying through a prime when those items could have been identified in a contract and bought directly from the supplier at significantly reduced prices. AFLC would do well to follow the example of Air Force Systems Command (AFSC) and hire a group of professional cost estimators and systems analysts to straighten out the current system.

The leadership associated with the Logistics Command is also very critical. The military system has the tendency to assume that an officer with the appropriate rank can fill any position without regard to educational background or actual experience. This practice is particularly true concerning general officer positions and has been detrimental, in some cases, to effective leadership in those areas requiring technical or prac-

tical expertise. In the logistics area, for example, we need people with estimating, budgeting, managing and accounting experience to name just a few. With due respect to the aviators, they do not necessarily obtain or practice these skills while in flying duties and therefore they should not be expected to fill a slot in AFLC requiring the expertise they do not have.

Another serious problem we are experiencing is that we are trying to put too much on our plate in an attempt to make up for the time lost during the Vietnam conflict. In Vietnam we attrited more aircraft than we bought during the seven years. This resulted in an aircraft shortage to meet force structure and backup aircraft requirements. We maintained a facade until very recently by a system of "creative bookkeeping." Now we have reduced force structure to more appropriately utilize available assets and we are trying to buy more aircraft to regain the force structure we once had.

Our force structure also aged due to the insufficient procurement level during the Vietnam conflict. This has added to our budget requirement as we attempt to maintain, modify and upgrade older aircraft. As the age of our fleet has increased we have had to spend more money on upgrade modifications just to keep our aircraft reasonably current with the technology available. Therefore, we have seen our modification bills jump from one billion dollars per year to over three billion dollars a year. We have also had the unusual problem of having to put an upward limit on the number of aircraft that can be into periodic maintenance and modification lines at any one time because of the limited number of aircraft that were available to maintain the combat ready status of our aircrews. Exacerbating this problem was an increased training requirement brought about by higher than expected attrition of aircrews during the mid to late 1970s.

The fighter force aging problem will not go away soon. We should have been building and should be building now, 300-350 fighter aircraft a year to maintain a force age no older than 10 years average. However in the last several years we have procured as few as 176 fighter aircraft in a given year. Without increasing the fighter procurement rate substantially, any desire or effort to increase force structure will be futile.

Another very important aspect of procurement planning deals with coordination between the services and cooperation by other DOD agencies. In the last 18 months we have begun to plan more effectively with other services, particularly with regard to logistics support and lift requirements associated with moving troops and equipment. In our mission area analysis assessment of airlift, we find that we can only meet a fraction of the requirements. Most of the shortfalls are intheater and related to the movement of outsized cargo. It does little good to get equipment to the theater of operations and then be unable to move it to a combat area where it is needed.

A bright spot in the Air Force procurement system has been the performance of systems command. Although confronted over the past several years with unpredictable and very high inflation rates, this organization has performed very well. Particularly in the last two years the AFSC staff and commander have done exceptionally well in identifying problem areas and managing those problems within the constraints of the system. They have avoided the tendency, in most cases, to throw money at a problem for a quick fix. The program managers realize that proper, accurate budget estimates are critical and conservative assessments of technological availability is a necessity to maintain a properly paced and funded program.

This discipline has eliminated many of the problems seen in the past and has led to a more realistic approach to the problem.

One of the major detriments to a more efficient procurement process has been the organization of the DOD staff and in particular the office of Program Analysis and Evaluation (PA&E). When there was a unified program-budget review, the power and interest of PA&E was heavily in the financial area as it should be. In this capacity they could offer up alternatives to the Secretary of Defense based on what was available for a similar funding amount. Unfortunately, PA&E now operates independently and conducts a separate program review apart from the the budget review and because of their influence during this process, they have much more power than originally intended. Indicative of this power, influence and independence was the recent briefing given on the Hill by Mr. Spinney with the Director of PA&E in attendance and disagreeing with the concept and content of the briefing.

The value of PA&E to DOD and the services also is suspect because of the advocacy for certain systems or concepts that continue to exist and surface among the analysts in this agency. Mr. Spinney's Quantity-Quality briefing is an example of a concept that will not fade away. The autonomy of this shop and the relationship that appears to exist with some contractors and advisors have influenced their credibility with the Air Force, in particular.

I take particular exception to the way the Tactical Division has been operated. In all fairness to the Director of PA&E, Mr. David Chu, he has tried to avoid an adversary relationship but without changing the personalities, he is prone to failure. I believe the people associated with tactical matters have become a voice unto themselves and foster no loyalty to any service or to the Secretary of Defense himself. They seem to have a

purpose or purposes unrelated to this nation's best interest. Historically, PA&E has operated contrary to decisions made by the Secretary of Defense and have constantly reopened issues that have already been decided upon.

We can change that type of operation and relationship by returning to a single program-budget review as we have done in the past. I would recommend that the services submit their plan (POM) in the August time frame to PA&E for a joint assessment. They (PA&E) would then prepare the Program Budget Decision recommending force structure, financing or modernization changes upon which the Secretary of Defense could act. This would tend to equalize the leverage that PA&E now holds and force a responsible, coordinated position with the financial people in OSD. As it is now, the financial aspects are only given a cursory glance during the program review and then major problems are many times not identified until the budget review.

Another reason to delay the program review is the schedule of testimony by the services and the Secretary of Defense on the Hill. Until the Secretaries have testified on the current budget, rational decisions cannot be made on the follow-on years. The delay would give the Secretary of Defense time to become more familiar with what is available and to formulate a decision on what is appropriate for the following budgets. This single review also forces the Comptroller and PA&E to coordinate and results in a more balanced and fiscally responsible decision. If we continue with our current system, the OSD staff and Secretary of Defense himself will have insufficient direct linkage between the current and follow-on budget. That in my opinion, is critical.

Other than strongly recommending the single budget review, I think internally the Air Force must be stronger in assessing the requirements and

then going after the systems that will meet those requirements. We should not be tempted to accept the second best product when the best is within our grasp. C-5s, A-10s, and early versions of the F-111s are examples of where we compromised ourselves. We need to make it a matter of principle that we will take our objections all the way to the Congress when second best systems are being forced upon us, and when Congress is involved, we must be willing to go to the Executive Branch and to the public if necessary. General Gabriel recently demonstrated this type of integrity when he honestly stated his opinion concerning the pay freeze. Without any indication of disloyalty, he expressed his true feelings regarding his objections to a pay freeze.

The preceding has been an up front, candid and detailed analysis of the Air Force procurement system by two very knowledgeable general officers. In their assessment they considered external as well as internal influences that impact on procurement practices. A number of problems were identified and these two officers offered solutions to what they consider the most serious difficulties.

It is interesting to note that many of the problems identified by military officers have existed for some time and have persisted despite changes in administrations, Congress, OSD and military leaderships. An editorial in Business Week Magazine in 1971⁵ exemplifies this situation. In a discussion of the scandals associated with Lockheed and Grumman, the editorial states:

This sort of thing makes a joke--and a very bad joke at that--out of military budgeting. It shows, if any further evidence was needed, that neither Congress nor the public really has any idea of how much the nation will have to spend for military procurement or what it will get for its money.

Twelve years later we still see these same type of articles pointing fingers at a wasteful military procurement system.

In a pamphlet titled Should Cost/Will Cost/Must Cost,⁵ prepared in 1972, concern was expressed about weapons system costs and cost overruns.

To quote from this document:

The reason why initial weapons system cost estimates, or for that matter estimates calculated mid-way in the weapon's life cycle, do not reflect the fullest cost possible--and therefore do not reflect a closer approximation of later costs--are complex. The reasons are found in the prevailing incentive systems--that combination of rewards, conditions and constraints which drives individuals and organizations to do the things they do. The reasons are found in the incentive systems implicit in government procurement (i.e., contracting process), in military command relationships and in the industrial marketplace. . . . Cost growth, the positive difference between ultimate cost and initial cost, is a function of the prevailing incentive systems, and incentive systems can be changed.

Further discussion in this pamphlet related that military procurement puts at stake, jobs, careers, profits, and prestige as well as national defense needs. The system must respond to all of these factors and deal fairly with all concerned parties. The impression of the public is that the system is not responding to the interests of the public and the needs of the nation. In fact too many systems exceed design costs, are not produced on time and have technical problems associated with design or performance. Of course these systems are the ones that attract attention and are used as examples to indicate how the system is working.

The GAO offered an analysis of what is wrong with procurement in their report of November 1979 titled, Impediments to Reducing the Costs of Weapon Systems.⁶ To quote from the cover of this pamphlet:

Major weapons' cost growth since World War II far exceeds the rate of inflation, and no relief is in sight. Various Department of Defense efforts to restrain costs are worthwhile, but unlikely to achieve really substantial cost reductions. The rising costs have reduced the quantities of weapons produced and widened the US forces' numerical disadvantage with the Soviet arsenal.

To further quote from this source:

Many complex factors contribute to high costs; however, the military's desire for maximum performance, high technology weapon systems together with congressional funding instability and constraints are the major cost drivers. Military and political considerations may prevent fundamental changes. . . .

One of the factors driving the cost of systems upward that GAO has alluded to is a propensity to produce major systems at less than optimum production rates. Lower production rates mean of course that overhead costs go up and in most cases material costs also increase because of lower volume purchases. An example of how production rates affect cost was presented in the previously mentioned GAO report. This chart indicates how the price of the Navy's F-14 changed as the planned production rate decreases.

	Quantity	Unit Flyaway Cost (UFC)	Manufacturing Portion of UFC	Non-Mfg Portion of UFC
Planned	200	\$10M	\$ 8M	\$2M
Actual	50	\$18M	\$10M	\$8M
Increase	-	\$ 8M	\$ 2M	\$6M
% Increase	-	80%	25%	300%

The effect of stretched procurement on Air Force aircraft pricing can also be shown. For example, the average unit price of the F-15 increased over 100 percent from 1976 to 1982 as the production rate decreased from over 100 aircraft per year to less than 50. The following chart illustrates this example although the magnitude of change would not be quite so dramatic if constant dollars were used.

(Then Year \$) F-15		
Fiscal Year	Production Rate	Unit Cost
1976	108	\$13.25M
1982	30	\$28.03M

The cost increases associated with a drop in the A-10 production rate shows a similar trend.

(Then Year \$) A-10		
Fiscal Year	Production Rate	Unit Cost
1979	162	\$ 5.45M
1981	60	\$13.24M

The F-16 should not be left out as the same relationship between production rate and cost holds true.

(Then Year \$) F-16		
Fiscal Year	Production Rate	Unit Cost
1981	180	\$ 9.3M
1982	96	\$13.5M

(The figures for the F-15, A-10 and F-16 were extracted from Air Force POM and budget documents and may not reflect the congressionally approved program funding.)

There is a diversity of opinion on the value of multi-year contracting and the economic benefits that result. The GAO report states the following:

The savings gained through the use of multi-year contracting generally stem from -

--reducing recurring costs connected with the award and administration of a series of contracts over a span of time to non-recurring administrative costs for only one contract over the same period,

--reducing contract material costs through discount price breaks realized by purchase of materials in more economic order quantities,

--avoiding impact of price escalation on outyear material purchases, and

--increased efficiency resulting from continuity of work and stability of the work force.

GAO continued to report that:

. . . we found that savings are realized by federal agencies through multi-year contracting in a review which we completed in 1977. In that review, we identified annual savings of \$3M--about 21 percent--on a total of 26 Defense Logistics Agency and Air Force contracts valued at \$14 million.

General Cunningham on the other hand, is not necessarily a fan of multi-year buys. He stated that he is skeptical of something that industry likes and is excited about and he also pointed out several problems that detract from the benefits of a multi-year buy. The first problem is associated with economic factors--the budget is finalized based on the nation's economic well-being and if multi-year buys tie up a significant portion of the budget, little flexibility exists when changes must be made. The second problem with multi-year is the front-end application of funds required. This funding permits the contractor to purchase materials in more efficient quantities to support a guaranteed longer production run. However, to provide up-front funds, money must be taken away from other programs, therefore multi-year programming may be long-term stabilizing but it can and does create near term instability. The third problem is that multi-year savings that we have heard so much about are yet to be realized on major procurement items. We need to test this practice before we go overboard. We must first finish a major multi-year buy and then carefully audit the performance to see if the savings are really there.

Yet another viewpoint on the reasons for problems in the military procurement system comes from a doctoral dissertation by John Bennett titled, Department of Defense Acquisition Management: Congressional Criticism and Concern.⁷ In this book, the author points out that discovery of

the C-5 cost overruns in 1969 focused attention on the total DOD systems acquisition system and led to a reevaluation of the total package procurement methodology. This evaluation resulted in a change to systems prototyping as the major acquisition strategy.

Mr. Bennett goes on to state that the major problems with defense acquisition is management.

Management, not technology, is the pacing factor in the development and production of new systems within DOD. The loss of technological superiority, the mainstay of the nation's defense posture, is caused more by delays in decision making, organizational and process inefficiency, and overregulation and overadministration than from the inability to discover and apply modern technology. . . . While improvements are possible, there is little reason to believe that changes will be successful. The government way of doing business and bigness are factors with which DOD must contend. Fundamental changes in management philosophy and approaches probably will be required.

A charge that long-range technical planning is weak for DOD weapons holds some truth. The author lists several indications of this weakness.

1. A method for determining long-term alternative goals and military needs does not exist. The DOD system for relating long-term technical and system needs to broad military missions and goals is inadequate.
2. Identification of relative priorities of new weapon systems development is a major problem. There is no logical structure or organized method for measuring proposals against the total DOD need.
3. DOD often fails to think through technical requirements. It lacks comprehension of the long-term acquisition investment period. Technical forecasting approaches need to be vastly improved.
4. Organizational relationships between elements involved in technical planning are poor. Interservice duplication, poor user/developer

coordination, and downgrading of the technical capability contribute to this problem.

5. A new system of data input and synthesis to support technical planning is required. The lack of combat environment test data to determine operational utility is a limiting factor.

A report by the Defense Science Board in March 1980, Reducing the Unit Cost of Equipment⁸ pointed out some other aspects of the defense procurement system that have a tendency to drive up costs. One of these is a major unit cost problem is exacerbated by the philosophy that increased performance can make up for a quantitative disadvantage. The United States, by its actions for the last 20 years in accepting budgeting compromises, now has little recourse but to continue this philosophy.

The cost of equipment has reached such a degree that it is becoming more difficult to maintain current force levels and if improvements are not forthcoming, reductions in force levels may be required. The cost problem is driven to some extent by service competition for what they see as their fair share of the budget. This competition is based on how each service perceives its own responsibilities and missions in the nation's defense interest and without much consideration it seems for the total defense picture. This philosophy necessarily places undue emphasis on the near term and there is little regard for accurate estimates of future costs.

CONCLUSION

The problems in and with the military procurement system are as diverse as they are persistent. As mentioned at the outset, a piecemeal or patchwork approach will do little to improve the system as evidenced from the repeated practice of this approach during the last 30 years. A total

reevaluation of the system as well as the structure is called for if we are to have any chance to make "significant" improvements and reach the point of efficiency that seems necessary. In this endeavor though, we must also be practical and not seek perfection. Mr. Bennet, in his doctoral dissertation mentioned earlier perhaps said it best.

There are strong indications that DOD systems acquisition cannot be managed with the degree of efficiency demanded by the severest critics of DOD management. Four principal reasons support this finding:

1. Economic inflation, which has affected system costs, is beyond DOD control;
2. Changes in the enemy threat and advancements in military technology cannot be ignored during the systems acquisition life cycle;
3. Using current forecasting methodology and cost-estimating techniques, the cost of new systems can be estimated with no better than 30 percent accuracy;
4. Unknown technical risks plague new major systems throughout most of their development and production cycles.

We must be wise enough to concentrate our efforts to improve the system on those things that can or will be changed and avoid futile efforts to devote attention to those areas that defy changes. In this endeavor, we must also get our own house in order before we attempt to make changes in those areas not under military control.

RECOMMENDATIONS

The military has been charged, tried, and convicted of procurement mismanagement and now must make every effort to restore credibility and regain the confidence of the people. Therefore, every possible action must be taken to insure that we are managing the budget dollar in the most efficient manner, and we must avoid at all costs, a repeat of episodes like the Lockheed C-5 scandal.

It would be beyond the scope of this study and well beyond the knowledge and experience of this author to suggest and outline a new organizational structure to manage military procurement. In fact, a new structure is most probably not necessary to achieve greater efficiency--what is required is a look at the problem areas enmasse, so that a piecemeal problem solving approach is avoided. With this thought in mind then, a brief recap of the problem areas mentioned throughout this study will follow, accompanied by comments regarding actions or solutions that are pertinent.

The most critical area and the one receiving the most attention and publicity for sensationalism as well as political leverage is costs. This area includes cost increases after production decisions, underfunding, cost overruns, charges of gold-plating, and overcharging by defense industries. A reduction of problems in this area is dependent upon the integrity of every person dealing with the military procurement system but it is critical that every member of the military leadership influencing the POM and budget be knowledgeable of the fact that our cost estimating ability, particularly for new systems, is very inaccurate. There has been a tendency for some to accept back-of-the-envelope cost estimates as absolute and enter the figures obtained in this manner as concrete cost figures in the budget. This practice must be discontinued. There are also those that have a tendency to hide costs associated with a system under related, but not necessarily evident, items in the budget. This, of course, makes a system more attractive from a costing aspect. This practice too must be stopped.

Cost overruns, aside from those associated with inaccurate estimating, are in many cases associated with gold-plating by the users. We have made it a practice to constantly upgrade and change designs on systems after they

it a practice to constantly upgrade and change designs on systems after they have entered production. This not only adds to the production costs but it also adds a substantial modification price as we attempt to keep systems similar for operator and maintenance convenience. Numerous examples such as F-4, F-15, F-16 and A-10 configuration differences and changes could be cited. In this case we must avoid changes that provide limited increases in capability or maintainability at exorbitant costs.

Program underfunding, particularly in the years subsequent to the budget year, is a common practice that produces a yearly problem of some magnitude. As the five year plan is developed each year, the budget year is scrubbed for cost very thoroughly, but the follow-on years are only given a cursory examination. This practice evolves from two principle causes. First, because of the micro-management demanded by the system, there is not sufficient time to scrub all five budget years. Secondly, program managers do not give sufficient attention to follow-on year programming because they know that everything will change several times during the POM and budget review process and that time spent getting exact costs for a program that will never materialize is wasted time. Therefore, more credence must be given to the five-year plan rather than operating on a one year plan as we have done in the past.

Little can be done about defense industry itself, but the services and DOD can take steps to insure that undue advantage is not taken because of the lack of competition in a particular field. First, military specifications must be reviewed to cease practices where payment of 10 to 100 times more is made for an article that can actually be bought off the shelf from a local Radio Shack or Sears store. Secondly, contracting must be carefully reviewed to make sure the military gets the same or similar cost

and performance guarantees that a private enterprise would expect and demand. Reliability and maintainability standards must be met.

A second principle area of concern and probably the most important area of concern to military members is not how we buy but what we buy. Sometimes, the desires of the military are overridden by DOD, the Congress or the administration, and in those cases we must make the best of the situation, but the majority of systems and material are procured because of the desires of the particular service involved. The problems in this area revolve around incapable equipment, too sophisticated equipment, numerical disadvantages, maintainability difficulties, lack of guidance (strategy) from the top, insatiable appetite for new and higher technology equipment, advocates in uniforms pushing pet projects, readiness and sustainability tradeoffs, no long-range technical planning, inefficient and low rate procurement/production, etc., etc., etc.

Concentration of effort must be made in just two areas mentioned in order to alleviate almost every problem mentioned above. The first is the need for a long-range and comprehensive strategy on which procurement programs can be measured for effectiveness. Without such a strategy, and most importantly a DOD staff knowledgeable and capable of focusing service efforts, we have a three (or four) service approach on how to fight the wars of today and the future.

Secondly we must be capable of long-range technical planning. Today we find that there is little evidence of military planning in the technical arena, and we many times get taken for a ride by the contractor who has just invented or developed the ultimate system. By operating in this manner we oftentimes buy the wrong system and in the worst cases we hesitate to procure what is available with the hopes that something better is

being developed and will soon be available. We most often find that one to two years runs into 10-12 years and in the interim we are caught short.

The third and final area of discussion centers on integrity--in the military, in defense industry, and in the civilian sector that influences military procurement. The topics of interest in this area include: the relationship between defense contractors and military members holding positions of influence on the procurement decisions; the accountability of congressional staffers and OSD/OMB program analysts, leverage of major command leadership on the prioritization process, and unethical defense contractors.

The problem here is that it is very difficult to legislate integrity. What is perceived as ethical by one is not necessarily looked at in the same way by another. However, it is a well known and widely reported fact that many high ranking civilians as well as military members retire from service to a position in industry from which they continue to influence decisions concerning that industry. In many cases, not even a prudent time period elapses between the vacating of one job and the beginning of the next. Another example is the advocacy shown by staffers and analysts. OSD analysts, in particular, have a tendency to support certain systems or back certain theories for whatever reasons. The integrity issue arises when the advocacy continues and influence is sought outside of the DOD even after the Secretary has made a decision. Military commanders are of course responsible for optimizing the capability of their own command but they hold a higher responsibility to the good of the service and an ultimate responsibility to what is best for the defense of this nation. Too often we see the service and the nation taking a back seat to personal achievement. Unethical defense contractors are a more difficult problem but one which we must acknowledge exists. This will do much to decrease their

influence by the avoidance of making commitments to those that refuse to operate fairly.

There are of course other areas that have been mentioned in this study and require no further amplification. However, one subject has only been briefly mentioned and demands more exposure. An article on the editorial page of Harrisburg Patriot, April 15, 1983⁹ by William J. Lynn, covers the subject of interservice cooperation exceptionally well.

In 1948, the military service chiefs, together with Defense Secretary James Forrestal, agreed on the allocation of roles and missions among their respective organizations. . . . The Key West agreement based service assignments on traditional distinctions among land, sea and air warfare.

Since then, the services have retained their original assignments with only minor modifications, and, although the technology and tactics of war have continued to demand the greater use of integrated operations, the services have remained wedded to the organizational principle that armies walk, navies sail and air forces fly.

By maintaining these irrelevant distinctions, the Key West agreement has encouraged the services to consider the destruction and defeat of the enemy counterparts as their core function. . . . These separate (and often disconnected) strategies do not necessarily add up to a coherent national strategy. Consequently, the United States faces some disquieting anomalies in its overall force structure.

. . . outdated concepts of service roles and missions create problems in both the formulation and the implementation of defense policy. Yet the current debate over defense concentrates almost entirely on the level of spending for defense--whether to increase it by 10 percent (as President Reagan proposes) or by 5 percent (as his congressional critics advocate).

What both sides ignore is that many of the problems facing the Department of Defense result not from inadequate resources but from ineffective organization.

This rivalry for the defense dollar without an effective arbitrator is a serious problem. No one service can expect to fight a war alone, but each tends to operate autonomously in peacetime. The missions that require cooperative effort are usually the lowest of priority and have critical

shortages during wartime tasking. In the Air Force's corner, airlift shortfalls would be the most glaring example of this practice.

SUMMARY

Can the military procurement system be improved? The answer to that question is a qualified yes, because any type of improvement effort first requires the acknowledgement from within that something is amiss. It is hoped that this paper will open the eyes of a few and maybe bring forth others that have seen the problems but have not stepped forward as yet to offer solutions.

ENDNOTES

1. "The Winds of Reform." Time, March 7, 1983, pp. 18-30.
2. "Gold-Plated Weapons." Time, March 7, 1983, pp. 19-22.
3. Statements (edited) by Major General Charles F. Cunningham, Director, Programs and Evaluation, USAF, in a personal interview, Washington, DC.
4. Statements (edited) by Lieutenant General Charles H. Blanton, USAF Retired, in a personal interview, Washington, DC.
5. Office of the Assistant for Cost Analysis, US Army Safeguard System Office, Should Cost/Will Cost/Much Cost, June 1972, (Arlington, Virginia), pp. i-60.
6. United States General Accounting Office, Impediments to Reducing the Costs of Weapon Systems, Report to the Congress, PSAD-80-6, November 8, 1979, pp. 1-12.
7. John J. Bennett, "Department of Defense Systems Acquisition Management: Congressional Criticism and Concern," (George Washington University: 1974), pp. 208-211.
8. Office of the Under Secretary of Defense for Research and Engineering, Report of the Defense Science Board, 1979 Summer Study on Reducing the Unit Cost of Equipment, Summer Study Task Force on Reducing Unit Cost of Equipment, March 1980, Washington, DC, pp. 1-2.
9. The Harrisburg Patriot (Harrisburg, PA), April 15, 1983, Editorial Page.

DISTRIBUTION

- (1) HQ USAF/PRP
Washington, DC 20330
- (1) HQ USAF/PRPFT
Washington, DC 20330