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DEFENSE SYSTEMS MANAGEMENT COLLEGE

PROGRAM MANAGEMENT COURSE
INDIVIDUAL STUDY PROGRAM

AN OUTLOOK ON FUTURE
WEAPON SYSTEMS ACQUISITION

Study Project Report
PMC 77-2

J. Alan Higgins
Lt Col USAF

FORT BELVOIR, VIRGINIA 22060

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE *(and Subtitle)* AN OUTLOOK ON FUTURE WEAPON SYSTEMS ACQUISITION		5. TYPE OF REPORT & PERIOD COVERED Student Project Report 77-2 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) J. ALAN HIGGINS		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS DEFENSE SYSTEMS MANAGEMENT COLLEGE FT. BELVOIR, VA 22060		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS DEFENSE SYSTEMS MANAGEMENT COLLEGE FT. BELVOIR, VA 22060		12. REPORT DATE 1977-2 13. NUMBER OF PAGES 60
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)*

UNLIMITED

DISTRIBUTION STATEMENT A
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)*

SEE ATTACHED SHEET

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

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DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

DEFENSE SYSTEMS MANAGEMENT COLLEGE

STUDY TITLE: AN OUTLOOK ON FUTURE WEAPON SYSTEMS ACQUISITION

STUDY PROJECT GOALS:

To estimate the far team impact of the continuing restraints on the annual defense budget. Study goals include an overview of alternatives and options for continuing systems acquisition.

STUDY REPORT ABSTRACT:

The subject of future weapons systems acquisition is discussed in this learning paper. Considerations for the threat, technology, economic trends and the competition for resources are included. Prospects for reducing acquisition costs are considered and alternatives for planning, programming and budgeting are discussed. The summary concludes that the outlook for future major weapon systems procurements is not favorable.

SUBJECT DESCRIPTORS:

Acquisition Policy
PPBS
Other relevant policies

NAME, RANK, SERVICE	CLASS	DATE
J. Alan Higgins, Lt Col, USAF	PMC 77-2	November 1977

AN OUTLOOK ON FUTURE WEAPON SYSTEMS ACQUISITION

Individual Study Program

Study Project Report

Prepared as a Formal Report

Defense Systems Management College

Program Management Course

Class 77-2

by

J. Alan Higgins
Lt Col USAF

November 1977

Study Project Advisor
Mr. William H. Cullin

EXECUTIVE SUMMARY

This report considers selected issues and trends which will challenge future program managers. An overview and the impact of designated constraints is presented.

A three part approach is taken. First the issue of the threat, technology, economic trends and the competition for resources is considered; second, some prospects for reducing acquisition costs are discussed; and finally new alternatives to the current management methods of planning, programming and budgeting are reviewed.

The Soviets now spend approximately 15 percent of their GNP for defense as compared to 5.5 percent for this country. This outlay of funds has driven the Soviet production of military systems and equipment such that the U.S. leads only the category of strategic bombers, strategic nuclear munitions and helicopters.

While the threat analysis indicates that the USSR is moving beyond a position of parity, our systems to counter the threat are becoming outdated and obsolete. The business of modernization and procurement of new weapons is becoming increasingly difficult. This difficulty is compounded by spiraling inflation which stimulates prohibitive cost increases.

Funding for technology and research and development, which is essential to force modernization, is declining. This impacts on the

baseline for new weapons and is amplifying the shift in the power balance. Resources are becoming limited due to the various needs within the social sector. Consequently, new defense programs which are competing for these resources are not started or are frequently cancelled.

There are alternatives which hold promise for freeing funds for systems acquisition. Among these alternatives are jointly funded programs, Foreign Military Sales (FMS), and methods for reducing life cycle costs. However, no single option offers a total solution and at best, improvement in the acquisition process depends on the results of a combination of alternatives.

The present administration has proposed a three percent growth rate for defense. This proposal along with new budgeting methods, and procedures for establishing needs and setting priorities have been designed to enhance the prospects for modernization.

In conclusion the surge by the Soviet Union in the acquisition of new weapons this past decade coupled with other unfavorable trends indicate that outlays for national defense must be improved. However, this learning paper reports that the probability of success of any major weapon system in the next decade is marginal.

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SECTION I

INTRODUCTION

A continuing challenge faces tomorrow's military! While the threat continues to be imposing, a series of economic, environmental and ecological, public opinion and other factors increase the pressure and complicate the problems associated with any system acquisition. The future program manager is faced with a host of potential dilemmas which will compound the already difficult process of developing, producing and deploying a major weapon system. One has only to look at current inflationary trends, large social programs, depletion of fossil fuels, requirements for improved defense, and their synergistic effect to realize the compeitition for resources will increase dramatically in the next decade. As this country moves into the 21st century new energy sources will undoubtedly be required. Major reorganizations within the government sector and especially DOD may be necessary to accommodate the needs of each agency and satisfy the requirements for the various sectors of our society.

The military services, following the lead of former Deputy Secretary of Defense Packard, recognized the value of educational programs such as the Defense Systems Management College. It is the author's understanding that similar programs are being considered and may serve as the baseline for introducing other members of the Federal Government into a

formal training endeavor which follows DSMC guidelines. This plan and other efforts formulated to restructure agency mission areas, if implemented, would unquestionably aid in the understanding of the total budget requirements facing this country in the future. In addition, it would provide a common focus and approach for addressing, in the future, the management of resources which are critical and must be shared in a fashion beneficial to all.

SECTION II

COMPARISON BETWEEN THE US AND USSR

The Threat

A recent Aviation Week and Space Technology article carried in full the remarks of Major General George J. Keegan, Jr. (USAF Ret), former Chief of Air Force Intelligence, which were presented to a group of Washington newsmen. Major General Keegan's address, sponsored by the American Security Council, was intended to provide insight into the threat estimating procedures conducted by various National Intelligence agencies. The thrust of this address centered on General Keegan's personal views relative to the nature, scope, implication and gravity of Soviet threat and evolving world power balance. It is General Keegan's belief that:

> The Soviet Union today has a capability to initiate, wage, survive and emerge from a global conflict with far greater effectiveness than the United States and its Allies. (1:38).

Admiral Stansfield Turner, new director of the Central Intelligence Agency sees the United States/Soviet Union military balance of power gradually eroding and beginning to favor the Soviet Union.

Assessement of the US/USSR military balance indicates that in five key areas - strategic nuclear, naval, projection of power, NATO vs Warsaw Pact, and investment for the future - the Soviets have achieved parity and in some cases are moving into the lead. Over the last decade the Soviet defense budget has increased approximately three percent per year in real terms. During this same period the US defense expenditures have been

declining. From 1972-1974, the Soviets produced almost six times as many tanks, three times as many armored personnel carriers, seven times the artillery pieces and approximately 400 more tactical aircraft than the U.S. Soviet investment in military and Space R&D has been increasing and has surpassed this country's outlay in this area by over 60 percent. Other estimates indicate that the Soviet spending for ICBM's is over three times as great as that of the US. The USSR also invests about 30 percent more for high performance aircraft and approximately 90 percent more for ships and boats. According to former Air Force Secretary Thomas C. Reed:

> ....The Soviet Union now devotes more than one sixth of its GNP to military programs. There are, he reported "no indications of restraint in Soviet ICBM deployment, submarine construction or Backfire (Strategic Bomber) production." There is no lessening of production in tactical areas, nor any indication of cutbacks in the massive Soviet research and development programs (2:68).

Table 1 illustrates a comparison of US/USSR inventories and production rates from 1972-1974.

TABLE 1.

US/USSR INVENTORY AND PRODUCTION RATE COMPARISON (72-74 AVERAGE)

WEAPON CLASS	U.S.		USSR	
	TOTAL INVENTORY	PRODUCTION RATE/YEAR	TOTAL INVENTORY	PRODUCTION RATE/YEAR
SHIPS	161	11	225	39
TANKS	10,000	462	48,000	3,000
TACTICAL A/C	4,800	540	5,100	930
HELICOPTERS	9,000	920	2,100	710
ARTILLARY	4,695	170	22,000	1,200
SUBMARINES	116	3	350	11

SOURCE (3:3)

US Versus USSR Military Spending

The Gross National Product (GNP) statistics are the only data permitting a comparison at the international level of the economic capabilities of countries. The GNP is however a very rough and far from accurate indicator, and quantitative comparisons encounter several conceptual and statistical difficulties. Results should be accepted only with caution. In the absence of better indicators they are worth studying.

> Statistics indicate a close relationship between GNP and military expenditures. In 1967 the ten countries ranking first in economic output, in decending order, were the United States, Soviet Union, West Germany, France, Japan, United Kingdom, China, Italy, Canada and India. Together they produced 76 percent of world GNP and accounted for 87 percent of world military expenditures. The United States and the Soviet Union together contributed nearly half of total world production and 70 percent of world military spending (4:15).

What are the Department of Defense funding requirements and how have they varied in the past? According to the Annual Defense Department Report for FY 1978 presented by former Secretary of Defense Donald H. Rumsfeld to the Congress on January 17, 1977 the DOD requirement for FY 1976 to FY 1978 ranged as follows:

TABLE 2.

DOD FUNDING REQUIREMENTS
(CONSTANT FY 1978 DOLLARS IN MILLIONS)

	FY 1976	FY 19TQ	FY 1977	FY 1978
TOTAL OBLIGATIONAL AUTHORITY (TOA)	97,511	22,545	110,190	123,150
BUDGET AUTHORITY (BA)	102, 233	21,741	106,643	120,487
OUTLAYS	88,537	22,110	98,300	110,100

SOURCE (5:315)

Total obligation authority (TOA) refers to the value of the direct defense program for each year. The direct program for a particular year is financed in part from prior year balances of budget authority. TOA does not reflect certain transactions, such as trust fund sales, but does include the proceeds of off-the-shelf sales to other nations which are used to acquire new items.

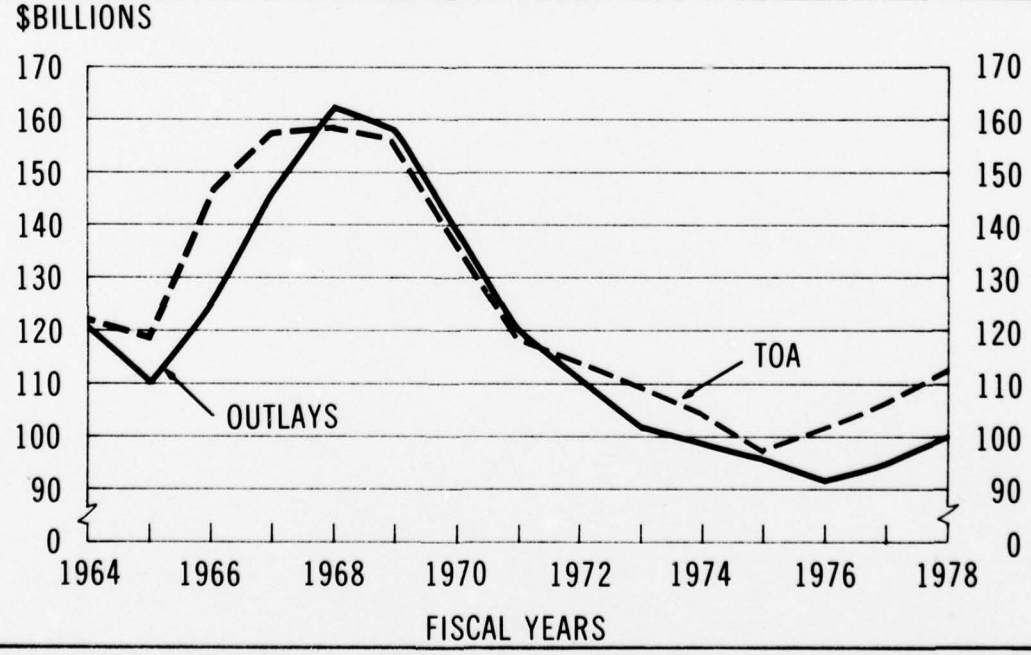
Budget Authority (BA) represents the legal authority to incur obligations, that is, authority to hire personnel or enter into contracts involving expenditures of funds from the Treasury, within a specified period of time. Budget authority in most cases, is provided by the appropriations process, but there are some exceptions. The most significant exceptions involve the transactions of the trust fund for foreign military sales and sales from the stockpile.

Outlays represent expenditures or net checks issued. About three-quarters of FY 1978 outlays will result from FY 1978 budget authority, the remained will come from budget authority provided in FY 1977 and earlier years (5:315).

Plots of the Department of Defense Budget Trends are shown in Figure 1 and 2.

FIGURE 1.

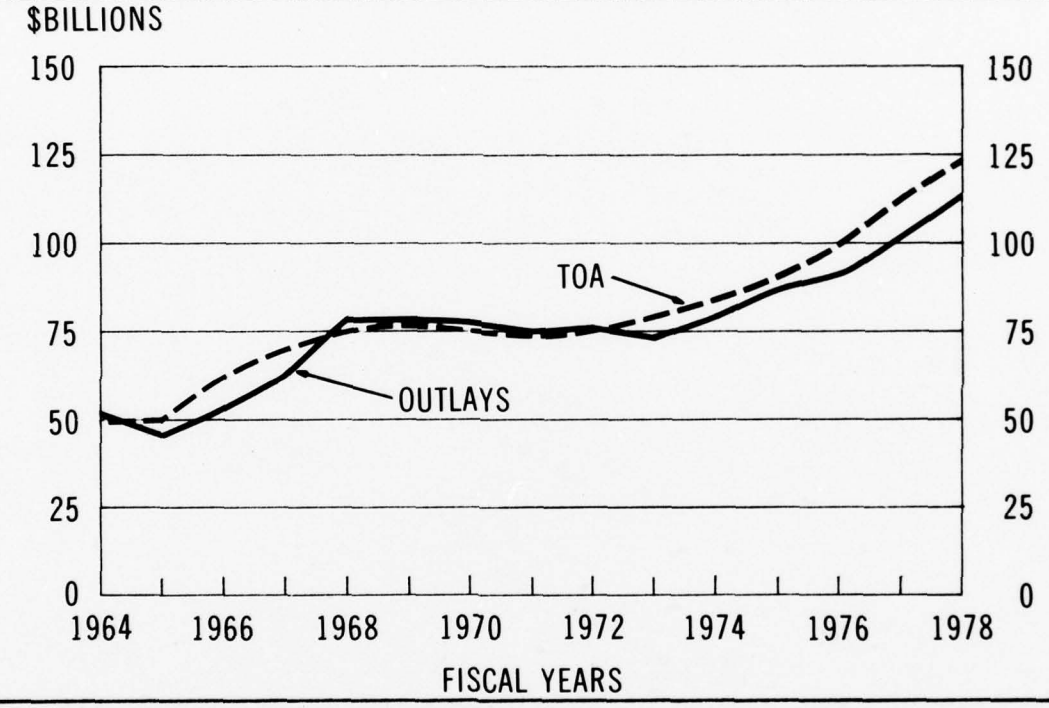
DEPARTMENT OF DEFENSE BUDGET TRENDS
(BILLIONS OF CONSTANT FY 1978 $)



SOURCE (5:C-1)

FIGURE 2.

DEPARTMENT OF DEFENSE BUDGET TRENDS
(BILLIONS OF CURRENT $)



SOURCE (5:315)

In order to understand or compare our expenditures with those of the Soviets a basis must be established. The argument for converting dollars to rubles and visa versa is continually under scrutiny. Results should be used with caution and caveated as appropriate. Comparisons of US and USSR defense expenditures and their major components can be made in many ways. Two which are commonally used are US defense spending in dollars (Figure 1 and Figure 2) and USSR defense outlays converted to dollars.

> The dollar estimates provide a common denominator that allows a comparison between the level of military effort of the USSR compared with that of the United States. What the dollar figure for the Soviet Union shows is how much it would cost the US to provide the Soviet forces if we were to field such a force. It does not indicate who outspends whom-it does tell us how much we would have to spend to get a like force. If this is kept in mind, index number problems, exchange rates. relative productivities, and all the other economic jargon are superfluous. Neither the Department of Defense nor the CIA has ever claimed any more than this for the figures. In this regard, then, the results are unchallengeable-it would cost us fifty percent more than we are now spending to field the force the Soviets now possess. This is only one measure of the Soviet level of effort. (6:128)

In addition, the problem of opportunity cost (i.e. what the US and USSR give up in investment or consumption or some combination of the two, to support a given level of defense expenditures) is foregone. The CIA's baseline budget analysis for comparing levels of military effort follows the method of showing what it would cost the US in terms of providing a force like that marshaled by the Soviets. Knorr uses a different approach for the elimination of opportunity costs and arrives at the disposable surplus for the military sector as follows:

Military Sector Surplus (4:15)

(1) Gross National Product prior to increase in military demand

(2) Output of productive reserves or national additions to the labor force (plus)

(3) Reduced civilian consumption (minus)

(4) Reduced gross domestic investment (minus)

(5) Reduced non-military purchases of government (minus)

(6) Change in net foreign investment (plus or minus)

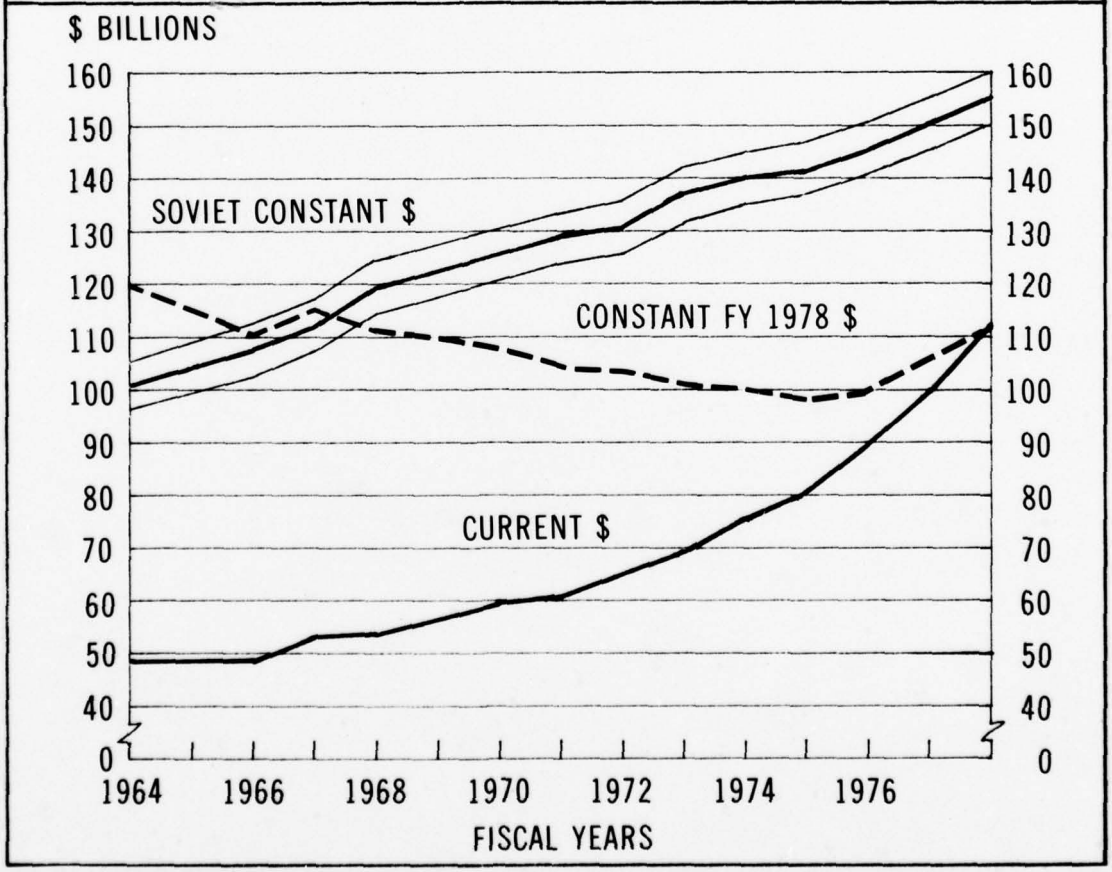
(7) Change in labor productivity (plus or minus) equals

(8) Disposable surplus for the military sector

Adhering to Department of Defense and CIA methodology the results are beyond question; it would cost us 50 percent more, as Maj Gen Keegan pointed out, than is now being spent to field the forces the Soviets now possess. These results are shown in Figure 3.

FIGURE 3.

DEPARTMENT OF DEFENSE FORCES BUDGET TRENDS
(TOA $ BILLION)



SOURCE (5:C-1)

A financial summary of the DOD budget is shown in Table 3.

TABLE 3.

FINANCIAL SUMMARY
(DOD BUDGET AS PERCENT)

	FY 66	FY 68	FY 76	FY 77	FY 78
FEDERAL BUDGET (OUTLAYS)	42.9	43.6	24.1	23.9	25.0
GROSS NATIONAL PRODUCT	8.2	9.4	5.5	5.4	5.4

SOURCE (5:C-8)

The Soviet defense spending consumed about 15 percent of their GNP in 1976 while our defense budget was 5.5 percent of our GNP. Table 3 shows how the percent of the U.S. defense budget has been declining. The Soviet figure has remained consistent at about the same percentage, even though their GNP has grown faster than that of the U.S. At the same time, the U.S. defense percentage of GNP is about half what it was in 1955.

Thus, from the standpoint of a modest review of the threat and estimates of how the Soviets are directing a large part of their country's resources, it appears that relatively speaking the United States is following a path toward declining military balance. For the past 30 years the United States has held a military position superior to the Soviet Union primarily because of technological advancement and sophisticated weaponry. This advantage was due, in part, to the continued emphasis on defense and willingness to provide outlays in this regard. A vivid illustration of

the restrictive major weapon system procurement policy and the decline of our defense flexibility occurred with the cancellation of the B-1 bomber.

Former Secretary of the Air Force Thomas C. Reed, in a letter to the editor which appeared in the October 8, 1977, Washington Post, commented "Yes" in answer to the to question of maintaining the strategic triad. (7:A-10). The problem is that the equipment and weapon systems in the triad are wearing out and reaching obsolescence. Beyond 1990 the current bomber force will not be a viable component for strategic deterrence. Therefore, to continue to safeguard our defense posture, expenditures must be made on technology as well as research and development to insure options for weapon system procurement are being kept viable. The following section addresses the widening gap between the US and USSR in terms of outlays for technology.

Technology Comparisons

Gill in his writings Economics and the Public Interest cites technological progress as a dominating feature of growth. In order to expand, our technological progress has to increase accordingly. Scientific and technological advances boost military strength in two ways. First, new discoveries and innovations impact and benefit military technology. Second, there is an increase in labor productivity in the economy and hence an increase in economic potential.

Research and Development (R&D) is a critical element of national technological capacity. Knorr points out that:

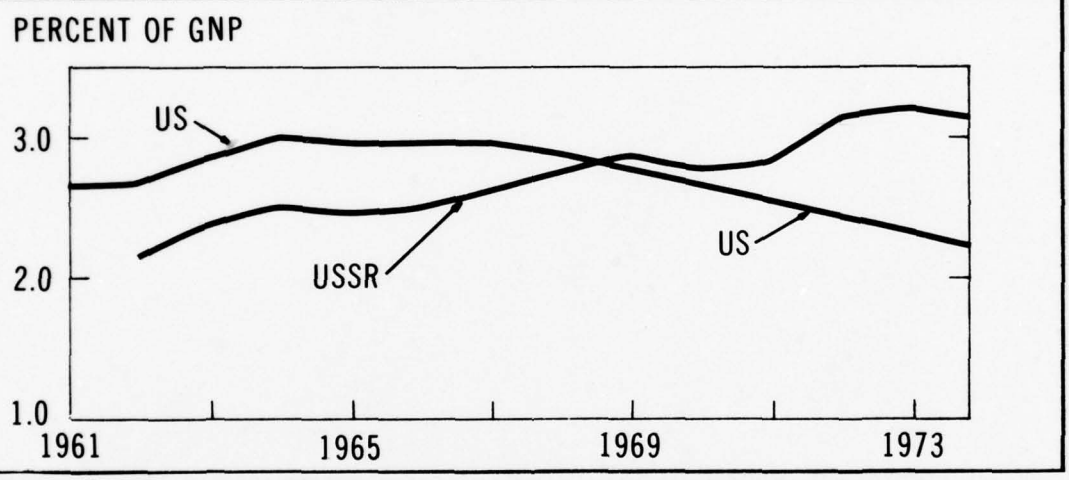
> Between 1955 and 1965 American outlays were more than ten times those of Britain and France together, and the latter two countries accounted for 85 percent of all expenditures on military R&D in Western Europe. In fact, at this time, the United States and Soviet Union are not only in a class by themselves in this area; they are also the only states cultivating the frontiers of military technology in all its sections, and are therefore, basically independent of technological inputs from other states (4:19).

Research and development efforts are not only critical to successful weapons system development, but essential as well to the economic growth of the nation. Following the 1950's expansion was the byword. In 1958 the space challenge required new investments in technology, research and development and other basic endeavors to advance the state of the art. This national objective was supported by industry and the government to the extent that major investments were made in space systems as well as aircraft and missile systems. Nearly 90 percent of federal R&D expenditures went to national defense and space in the early sixties. Space research and technology amounted to approximately 40 percent of every federal R&D dollar in 1966. However, since 1963 the total baseline for R&D has been falling. Currently only 60-65 percent of these federal expenditures are for R&D. Between 1967 and 1975 a sharp reversal in funding was experienced and during that period cutbacks of up to 40 percent occurred. The areas affected most by the cutbacks have been in the research area and critical elements for developing future force capability. General William J. Evans, former Commander of the Air Force Systems Command, stated in a 1976 address before the Air Force Association Symposium that only four percent of the FY 77 Air Force budget is allocated to advanced and basic technology programs (8:70). These source programs lead into systems for improving

and updating the force structure. They represent the technology baseline for weapon systems which can augment or replace those in the triad, strategic offense and defense, tactical, and the general purpose arena. The total national outlay for R&D as a function of the Gross National Product is shown in Figure 4 below.

FIGURE 4.

NATIONAL SPENDING ON R&D



SOURCE (9:38)

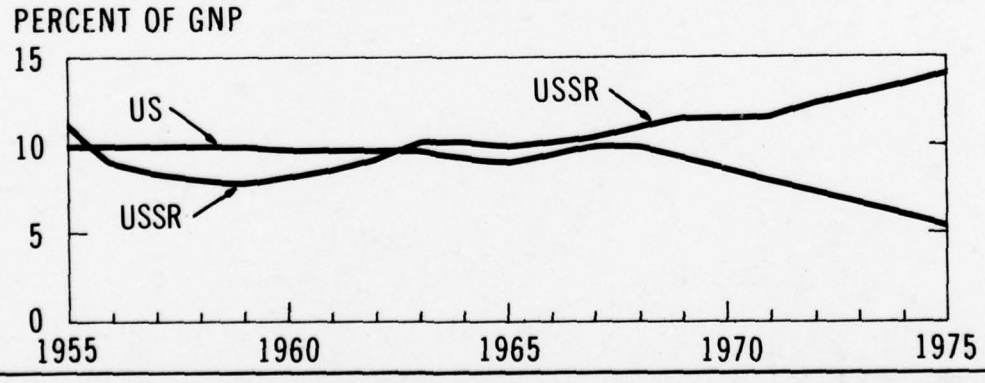
A foreboding illustration of Soviet endeavors in the area of R&D appeared in a May 2, 1977 edition of Aviation Week and Space Technology. In this report the Soviets are credited with an on-going development effort which utilizes a charged-particle beam weapon for negating US intercontinental and submarine-launched ballistic missile nuclear warheads (10:16-23). Developments of this nature are not suprising when one considers the exmphasis on national priorities and defense outlays by the

Soviets. In contrast to what has been a declining proposition for the United States the Soviets have been increasing, by all indications, defense expenditures in research and development, and test and evaluation since the early fifties. In 1958 the estimated defense share of the Soviet GNP was almost eight percent. This has increased to approximately 15 percent today. Defense and space outlays will increase to approximately eighteen percent in 1980 if the present trend continues. This represents an increase in the R&D investment of over $2 billion per year.

A poignant feature of the comparison of the US and USSR expenditures is the rapidly expanding divergence. This aspect is vividly illustrated by looking first at the overall trend in the share of GNP for defense between the US and USSR. These trends are shown in Figure 5.

FIGURE 5.

TREND IN SHARE OF GNP DEVOTED TO DEFENSE IN THE US AND USSR

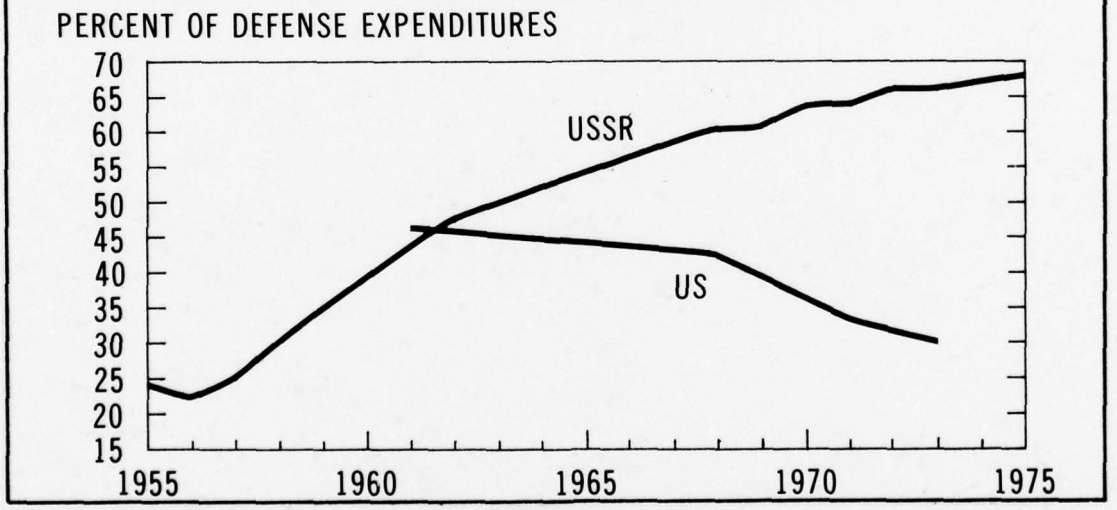


SOURCE (11:86)

Following the Vietnam war the United States' priorities were altered and the percent of GNP for defense declined from about ten percent to about five percent today. The Soviets on the other hand have continued to increase outlays for defense. These outlays equaled 15 percent of their GNP in 1975 as the estimate in Figure 5 shows. Combining procurement and RDT&E yields another interesting area for comparison and illustrates another trend in the basic strategy for technology emphasis and investment between the US and USSR. This comparison is shown in Figure 6.

FIGURE 6.

US AND USSR SHARES OF DEFENSE EXPENDITURES TO PROCUREMENT AND RDT&E



SOURCE (11:86)

In the early 1960's both the US and USSR were allocating approximately 45 percent of their defense expenditures for procurement and RDT&E. This outlay has since spread to the extent that the USSR expends twice as much. It equals a 60 percent outlay for the Soviets as compared to approximately 30 percent for the US.

The menacing aspect of these simple comparisons is that over the past two decades the Soviets might in terms of a standing military has increased to the point that they are superior in every weapon system category except helicopters, strategic bombers, and strategic nuclear munitions. Moreover, while they have a clear edge in quantity they are developing a firm and rapidly growing technology base. The US has always maintained the technology edge. If the current trend continues this edge will be foregone and our national security severly threatened.

It is in this context that the program manager must consider his program and extend to the utmost the technology base within the given dollars. He must carefully consider the technology imputs essential to major weapons system procurement and work towards a policy of keeping open only the most viable options in order to insure that all resources are conserved and used to the optimum extent.

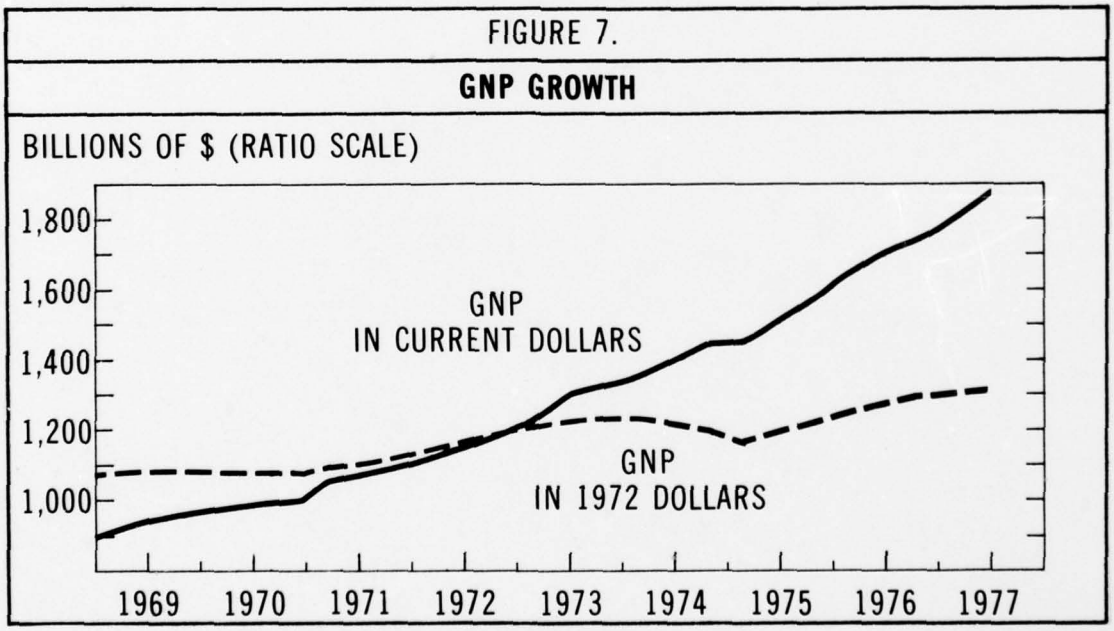
SECTION III

TRENDS

Economic Considerations

The U.S. economy has continued to expand and since 1969 the gross national product (GNP) has increased 18 percent in terms of 1972 dollars. Growth of the GNP not considering the impact of inflation during this period has amounted to approximately 200 percent. This increase is illustrated in Figure 7.

FIGURE 7.

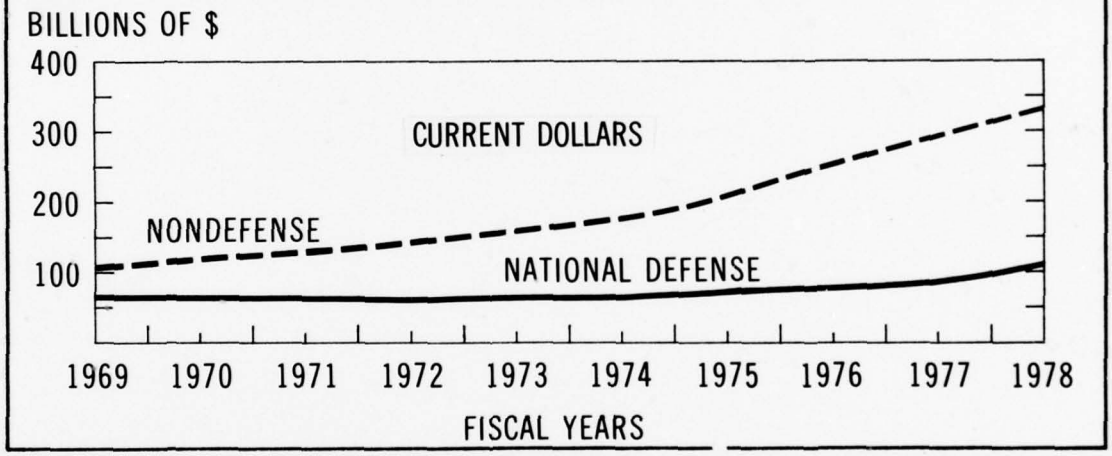


SOURCE (12:1)

While there is continuing growth in both the Federal Budget and GNP, it is interesting to review the rate of change in nondefense and national defense outlays. Both have increased as is illustrated in Figure 8. Note the dramatic rise in the nondefense as compared to the flatter, more constant slope of the defense outlay.

FIGURE 8.

NATIONAL OUTLAYS DEFENSE/NONDEFENSE



SOURCE (13:13)

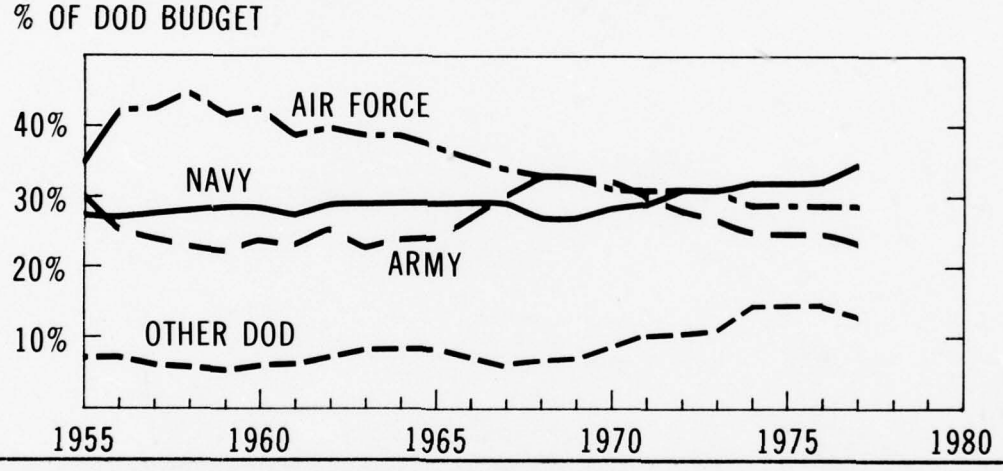
Individual Service Share of the Annual Budget

President Carter announced recently that it will be his policy to achieve a level of defense spending such that approximately 3 percent real growth can be realized and maintained. The implementation of such a policy approximates the trend which has been established in National Defense

spending over the past four years. Using this as a baseline, forecasts can be made on what the composite outlay for defense will be. The next question then is what portion of this budget can each service expect? In general terms each service's share is estimated to be about 30 percent of the total outlay. A historical plot is shown in Figure 9.

FIGURE 9.

MILITARY SERVICE ANNUAL SHARE OF BUDGET



SOURCE (14)

This illustration is based on allocations since the early 1960's. In the past the Air Force has received slightly more than 30 percent while the Army has received slightly less. The Navy has generally been somewhere in between although in recent years they have overtaken the Air Force. This increase in funding is due to outlays for ships. In FY 78 the Air Force received approximately 30 billion of the 110 billion dollar budget. Over the next 10 years a rough planning estimate for each service would provide a flow of about 30 plus billion and a ceiling of approximately 40 billion. This estimate will be considered again in section V in the discussion of

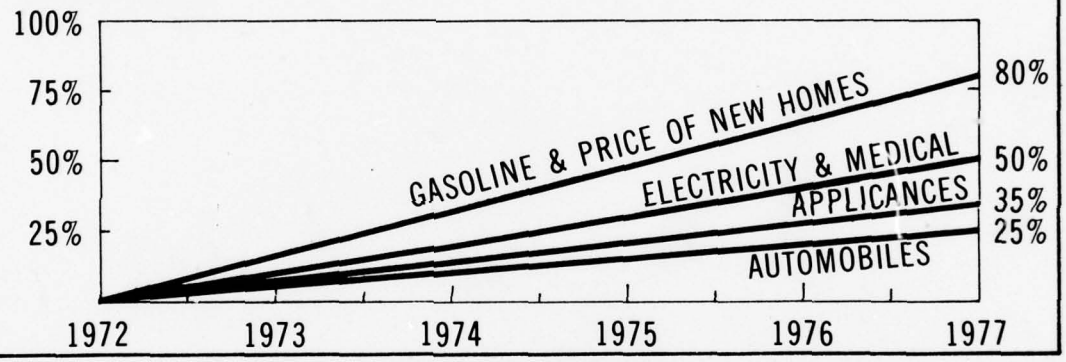
current policy.

Cost Growth and Inflation as it Impacts on Systems

It is worthwhile now to review another issue which impacts the problem of weapons system acquisition. That is the effect of inflation which is eroding the buying power of every budget dollar.

FIGURE 10.

% COST GROWTH OF SELECTED COMMERCIAL/BUSINESS ARTICLES



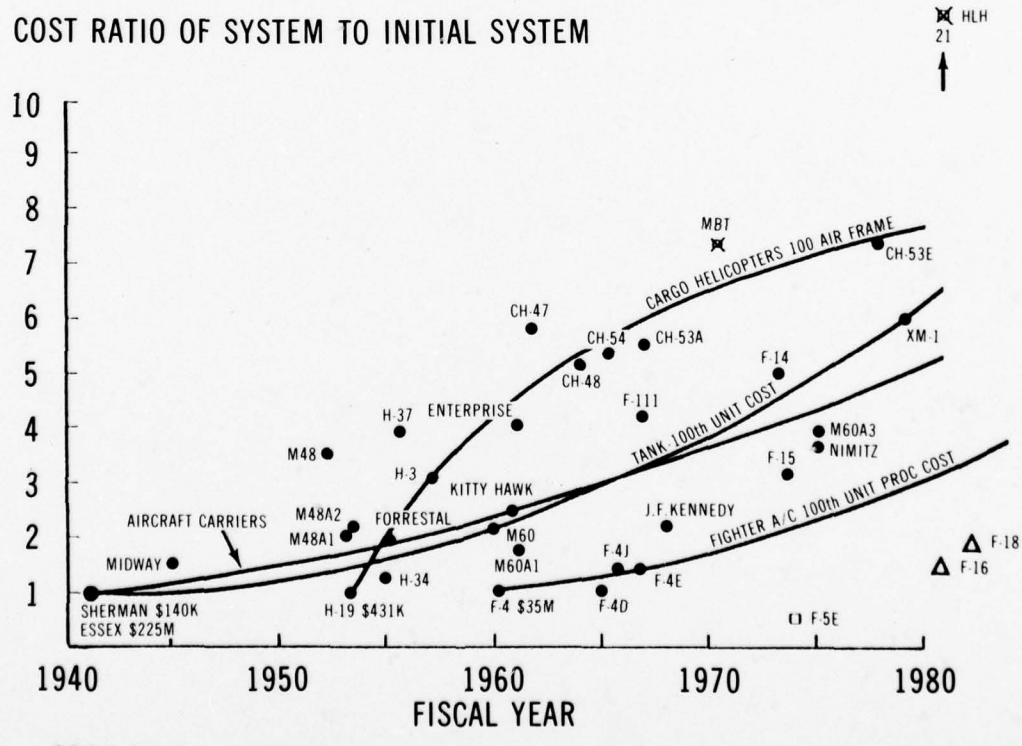
SOURCE (15:15)

Figure 10 shows how the cost of goods has increased over the past 5 years. This figure illustrates the rapid rise in cost of products on the civilian economy. All have a common baseline in terms of relatively simple technology and exhibit well established development foundations. While there is a continuing quest to improve these items from a commercial standpoint, the demand for major advances in the state of the art is not as high when compared to defense items. In general these products are developed with production techniques which are well established, design standards which are thoroughly documented and with materials which can be easily fabricated.

On the other hand, contrast this to the acquisition and production of military weapon systems. In general they require advances in the state of the art and are complicated because of the technology base they evolve from. Many require sophisticated fabrication and assembly techniques. New materials are frequently introduced due to the system's extreme operational environment. Moreover, the development focus is frequently on a system within an area offering few companies for competitive manufacture. All of these factors tend to drive the system's costs upward. Figure 11 illustrates some of the cost trends associated with major weapon system acquisition.

FIGURE 11.

TREND IN WEAPON SYSTEM ACQUISITION COSTS★



★ COST OF ALL SYSTEMS IN CONSTANT FY 74 $ AND CONSTANT QUANTITIES

SOURCE (3:14)

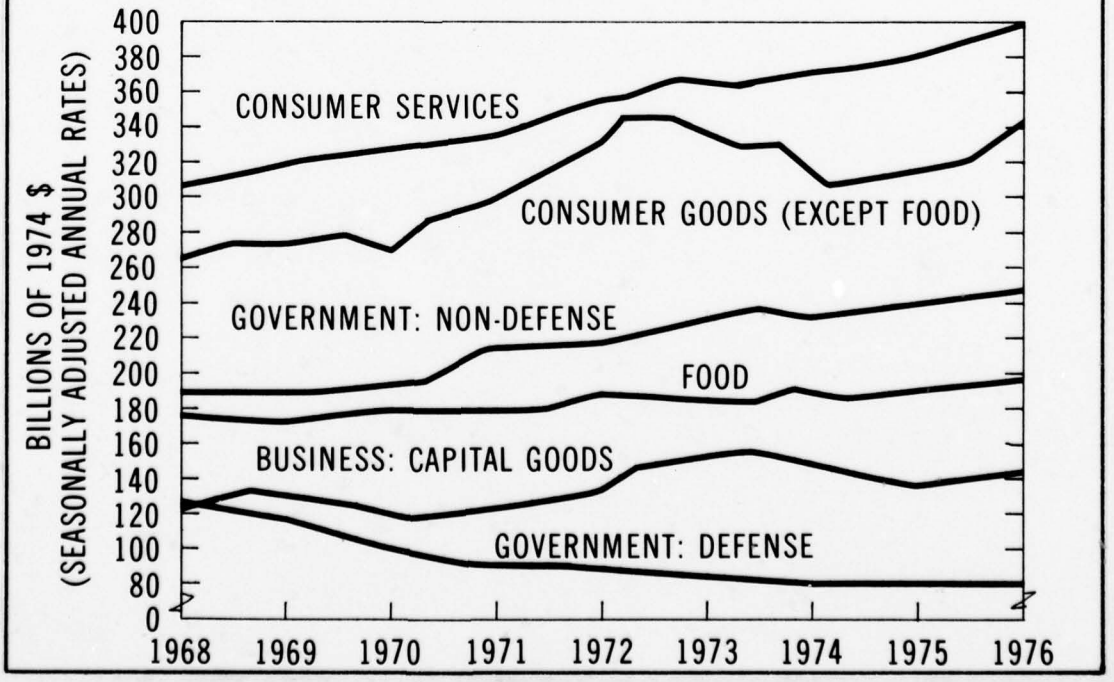
These trends point to prohibitive cost increases and indicate that the probability of large weapon systems buys will be difficult and possibly nonexistent in the future. Additionally, they illustrate, in the author's opinion, that in order to support outlays of a major magnitude for future weapons, increases in the defense budget must be made. The 3 percent growth which is the target for the current administration falls well short of requirements if any systems are to be procured.

DOD Trends Relative to Other Sectors

Another review of the non-defense and National Defense outlays is in order. Figure 12 shows that National non-defense outlays are increasing at a rate of approximately 7.5 billion dollars per year. Investigations of the major sections in the economy show them to all be increasing. The sole exception is that of defense.

FIGURE 12.

THE COURSE OF SPENDING BY GNP SECTORS

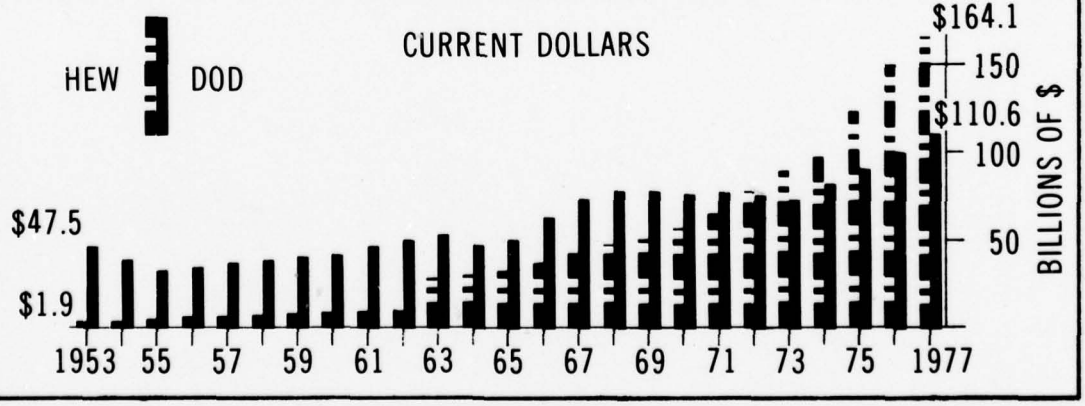


SOURCE (3:1)

One other aspect of the defense budget in the competition for dollars will be covered in the ensuing discussion. An interesting illustration was recently highlighted in US News and World Report. Competition and demand for the budget dollar in this country is altering. The Department of Health, Education and Welfare (HEW) for example has placed new pressure on the economic system. Since 1953 the HEW budget has increased by a factor of 86. Employment increased 326 percent. In 1972 HEW overtook and now outstrips defense spending. HEW's estimated budget in FY 1978 is $164.1 billions with defense estimated at $110.6 billions. The problem of reaching all sectors of society and being able to satisfy the needs of National security are becoming divergent. Figure 13 illustrates the dramatic change between Defense and Health, Education and Welfare outlays.

FIGURE 13.

HEW VERSES DOD SPENDING



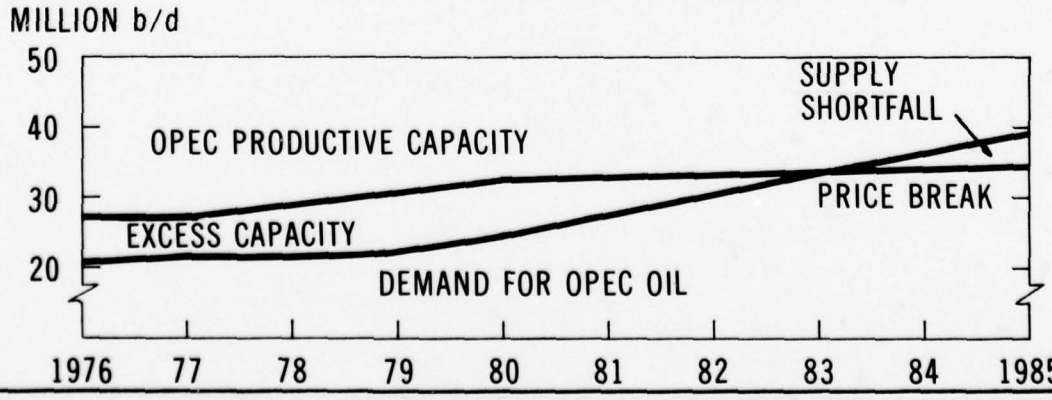
SOURCE (16:43)

The Impact of Energy Demands

To close out the review of trends one final issue will be considered. This consideration is for the energy outlook to 1985. The oil embargo in the early 1970's altered this country's economic growth. As an oil importer we have recently had to consider alternative means for fossile fuels and have had to review the world picture for the demand on energy. Even with the increased oil production from the North Sea and Alaska, our demand continues to outstrip our supply. Therefore, we must continue to rely on the Organization of Petroelum Exporting Countries (OPEC) for oil. Not only will the US be forced to place greater demands on this source but current estimates indicate that the Soviet Union will become an importer in the mid 1980's. In that time frame, estimates are that the demand for oil will be about 150 billion barrels per day for the United States, Canada, Japan and 19 free world countries in Western Europe. These countries are expected to have a capacity production of approximately 50 billion barrels per day during this time frame. As a consequence there will be such a high demand for OPEC oil that a supply shortfall is estimated in 1983. This projection is illustrated in Figure 14.

FIGURE 14.

OPEC OIL: THE SUPPLY/DEMAND GAP



SOURCE (17:16)

This projection becomes a major consideration since our economy will be responding to rising energy prices which are expected to follow the changing supply and demand for oil. What impact this will have on defense is not clear. However, it is conceivable that new weapons systems which use alternative energy sources will be required. Additionally, various sectors of the economy will be contending with higher prices and certainly will be making greater demands on the Federal budget. Here again is a situation in which the outlay for dollars will not be sufficient to meet all requirements.

It is interesting to note how estimates of this trend impact the Soviet Union. In the short term there appears to be nothing which offers substantive changes. It is expected that the forecast for higher investment in military goods will continue at the expense of investment in consumer goods. Fossile fuels production and use could alter this picture. In an article which appeared in the November 1976 Air Force magazine the following CIA estimate appeared:

> ....CIA estimates indicate that the Soviet military requirements and heavy industry will maintain prime claim on the nation's resources; improved technology will continue to receive emphasis. Agriculture and consumer industry will remain in approximately the same relative position. Although a goal in the tenth five year plan is to expand trade for chemical plants, oil and gas field equipment, wood processing equipment, motor vehicle manufacturing equipment and mining and construction equipment. Large amounts of equipment, as well as consumer goods, will no doubt be used to develop Siberian raw material according to CIA assessments. Fossile fuels and energy are areas which will impact the USSR. These needs are rising faster than domestic production rates and consume ever increasing shares of available domestic gas and oil. All of these factors coupled with need to expand the work force in the mid 1980's may cause an economic slowdown

and consequently a reduction in defense spending (18:66).

Although this prospect may appear favorable to the US in terms of reduced arms expenditures, other American economic issues surface and tend to negate these events if they materialize.

Thus it appears that a dichotomy in terms of an ample share of the budget and the constant level of growth desired for defense spending has developed. This problem faces the future program manager and he must be aware of it in order to successfully compete and develop the systems needed for secure defense. The next section will cover some of the potential means for possibly closing the gap and freeing dollars for systems acquisition.

SECTION IV

ALTERNATIVES

Prospective Solutions

What can be done in an attempt to adjust the current levels of defense spending and free funds for additional weapons systems acquisition?

There are a myriad of alternatives available; some are limited, others have what appears to be a significant potential and there are certain options with unknown potential. Among these considerations are the joint program activities where the procurement and development cost of a weapon is shared among selected services. One example is the weapon systems acquisition and program management scheme for the family of cruise missiles. On January 14, 1977 OSD established the Joint Service Cruise Missile Program Office (JSCMPO). This effort is devoted to the development of a cruise missile with three options for deployment. These are systems for air, ground, and sea launch. The Navy was assigned as the lead service with participation from the Air Force, who was assigned responsibility for the ground launched cruise missile (GLCM) development, and the Energy Research and Development Administration (ERDA), who has the responsibility for the warhead development. The management philosophy is to accrue savings through the development of systems with as many common elements as possible and to induce savings in the areas of maintainability, reliability and other logistic considerations. Cost avoidance is anticipated because of the commonality of subsystems and components which lead to a more efficient

test and evaluation. Other savings are expected due to lower common unit production costs, lower life cycle costs and lower total operating and support costs. The joint program approach is expected to be stressed and underscored as a key method for acquiring major weapon systems.

Other approaches which are sharing the limelight include Foreign Military Sales (FMS) and efforts between agencies with common goals such as the Air Force and NASA. Examples of the latter are the Space Shuttle program and the Aeropropulson Systems Test Facility (ASTF).

The Space Shuttle program is an effort to develop a transportation system for both civilian and military users. NASA is working with the Air Force which has been assigned as the DOD executive agent on this program. The Shuttle is designed to launch missions and payloads into space and return to earth by controlled landings. It is subsequently recovered intact and scheduled for reuse. Since the system can be recylced the replacement expense of rocket boosters can be eliminated for a great majority of future space missions. Moreover, the shuttle will be able to retrieve and to be used as a space station for spacecraft repair. In addition the cost of satellite replacements will be lowered since systems on orbit can be recovered for refrubishing and modernization.

The ASTF is a large windtunnel project located at the Air Force's Arnold Engineer Development Center. Since it will be used to the benefit of both the Air Force and NASA, it has been jointly funded and the cost of construction approved on that basis.

Another project of interest is the R2508 Enhancement effort. The program is scheduled to improve the utilization of the airspace over the Mojave desert in southern California. All three services work jointly through a policy board and have developed the requirements for a series of ground surveillance radars for improving flight monitoring activity. The Navy, Air Force, Army, and FAA are funding the project which will consist of strategically located radars throughout the floor of the R2508 complex.

Foreign Military Sales

FMS has received continued interest and promises substantial saving and cost effective measures in many areas. The benefits from FMS can be achieved in a number of ways. Unit cost of a particular system can be reduced due to increased production runs, and savings are effected because R&D costs are shared. The industrial base is stabilized and improved due to FMS. Also, a favorable balance of payments and increased GNP is realized. In addition, the logistics support base is broadened and at the same time equipment purchased through FMS and used by NATO and other allied nations can be standardized. This standardization promotes effectiveness and interoperability which results in total support cost savings.

Life Cycle Cost

Other concepts show promise for addressing the means to reduce the cost of weapon systems acquisition. Incentive and other special contract procedures, reliability improvement, warranties, prospects for direct licensing to reduce procurement cost all have merit and are representative of innovative methods for lowering outlays.

Another area of significance that has considerable potential and exhibits the opportunity for cost reduction is the life cycle aggregate expense and the cost associated with operations and maintenance. These costs are defined as:

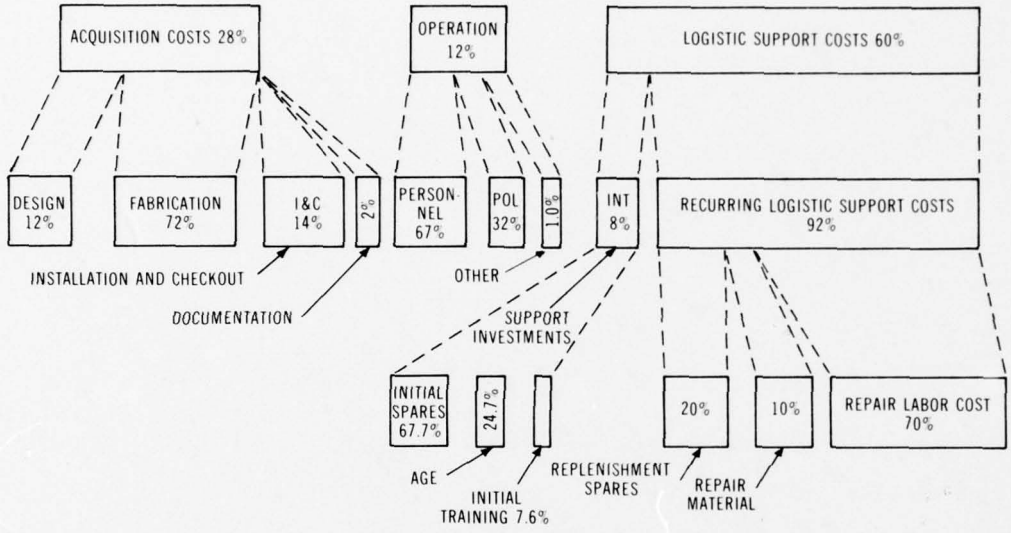
> The total cost to the Government of acquisition and ownership of that system over its full life. Included is the cost of development, production, operation, support and where applicable, disposal. (3:3)

These are the program life cycle costs and consolidate all areas of expense to deploy and maintain the system. Estimates have been made which show that the operating and support functions necessary to sustain the sophisticated systems of today run from 40-65 percent of the total cost. Total program outlays are spread over several areas. A typical profile of the percent of cost allocation of the four major areas in a systems life cycle is RDT&E 15 percent, mission hardware investment 25 percent, support investment 10 percent and operating and support (O&S) costs 50 percent (3:4) These O&S costs are largely determined at the onset of anticipated systems usage. The significant O&S drivers develop early in the program life cycle and emphasis is currently focusing on the methods for managing and reducing these costs.

How to approach this problem is a primary concern for the future program manager. The assessment necessary will be different for each system under consideration. However, for the purpose of this paper a model of the major cost drivers and elements is depicted in Figure 15.

FIGURE 15.

ASSESSMENT OF LIFE CYCLE COST 'DRIVERS'



SOURCE (3:32)

Each portion of this configuration must be considered. At the beginning of each program, estimates must be made for the necessary support requirements. The percentages in Figure 15 illustrate examples of the order of cost outlays which might be required. Using a model such as this can assist in the development of a management strategy for reduced life cycle costs.

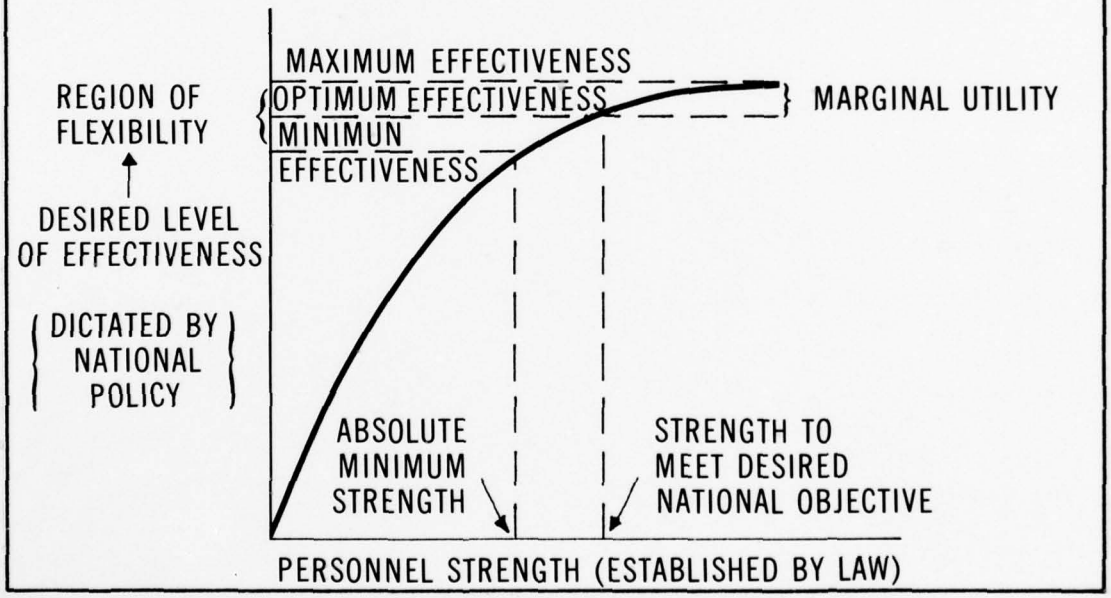
Manpower

It is interesting to note that in Figure 15 two areas, operations and logistics support costs, are labor and manpower intensive. Much of what can be done to reduce or free dollars for systems acquisition is dependent

on how to deal with the problem of manpower. Certainly it is recognized that the total force capability is sensitive to the trained personnel available to perform the mission. This level of manning is critical and necessary in order for the military to effectively accomplish national defense. Beyond a certain level force effectiveness becomes marginal and manpower reductions are no longer viable alternatives for cost savings. Figure 16 illustrates the issue of force strength and effectiveness.

FIGURE 16.

MANPOWER STRENGTH/EFFECTIVENESS



According to an article in the April 1975 Defense Manpower Journal,

> Although the trend of increasing unit cost of military hardware will inevitably play a decisive role in force structuring in the future, there is today

another even more dominant factor-personnel costs. People related costs consume approximately 56 percent of the current DOD budget. In the case of the Army budget, personnel costs exceed 69 percent. In contrast, the corresponding figure for the USSR is about 30 to 35 percent (19:37).

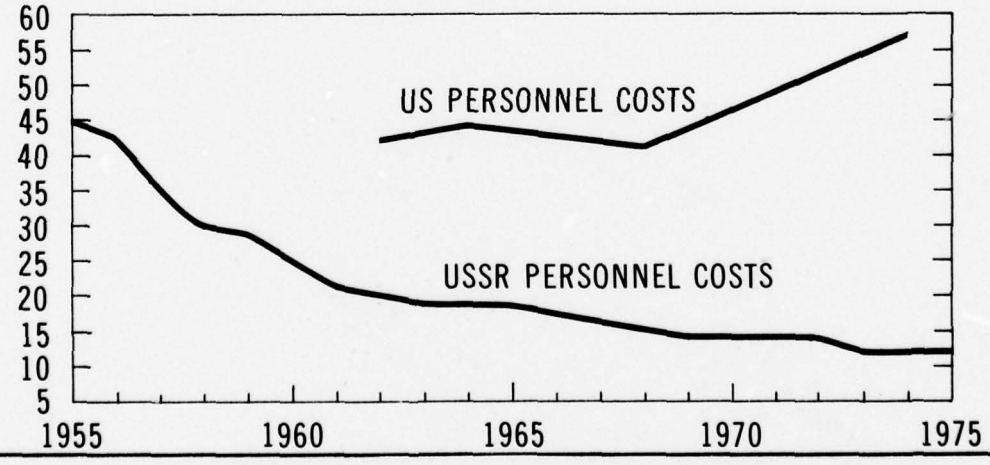
The trends in manpower costs when comparing the US and USSR reflect a dramatic difference. According to William T. Lee:

> In 1955, roughly forty-five percent of Soviet defense outlays went for manpower, while in Fiscal 1961 manpower accounted for about forty-two percent of the US defense budget (11:87).

This difference in expenditures is shown in Figure 17.

FIGURE 17

US AND USSR SHARES OF DEFENSE EXPENDITURES DEVOTED TO PERSONNEL COSTS



SOURCE (11:86)

The cost of manpower is obviously impacted by inflation. Another factor which bears on this problem is the prospective energy shortage.

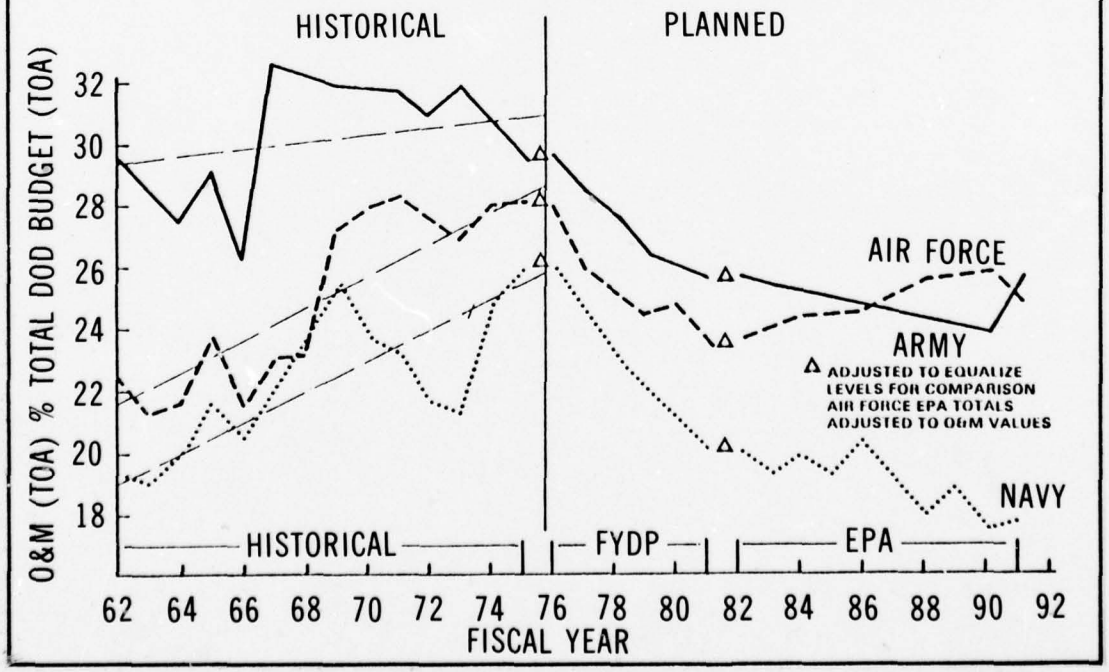
Traditionally our technology has progressed such that machines and equipment have been used to replace manpower. Because of increased productivity at a lower cost this was an obvious outcome. However, with the spiraling cost of oil and other energy sources, the substitution of manpower for machines, where possible, becomes an alternative for consideration. This requires study into the tradeoffs which must be made with lowering total life cycle costs. If additional manpower is an effective alternative it appears that cost growth levels can never be fully reduced and that other means must be considered for dealing with this dilemma.

Operations and Maintenance Costs

Looking at the historical trends and planned operations and support cost for each service shows some revealing characteristics. An illustration of these trends and future projections are shown in Figure 18.

FIGURE 18.

O&M AS A PERCENT OF TOTAL DOD BUDGET



SOURCE (3:18)

It is not clear what means are anticipated to drive the planned O&M cost downward. What appears to be the case is an over optimistic forecast and this optimism is projected into the Five Year Defense Program (FYDP) and the Extended Planning Annex (EPA). This type of forecasting may be one of the root causes for not being able to adequately address future budget requirements. At any rate the alternatives for an improved acquisition environment involve the consideration of many factors. It appears that the limitations are many and that a combination of strategies is necessary for effective cost savings. The hope for reversing the current cost trends through improved management and savings brought about by lower life cycle cost has some merit. However, one key issue involves the amount of savings that can be achieved and a question which requires an answer is if these savings can be sufficient to offset cost growth in other areas. If these savings are insufficient then the prospect for future major weapons programs and systems acquisition appears marginal.

The next section highlights the acquisition process in the event savings can't be accrued. Further it provides an approach to the problem given that the DOD is operating with essentially fixed funding.

SECTION V

CURRENT POLICY

New Requirements

Current guidance for Major System Acquisitions is contained in Department of Defense (DOD) Directive 5000.1; "Acquisition of Major Defense Systems", January 18, 1977. This directive along with OMB Circular A-109, "Major System Acquisition," April 5, 1976 and DOD Directive 5000.2, "Major System Acquisition Process," January 19, 1977, details policy for the management of processes for major weapon system acquisition. A critical requirement within DODD 5000.2 is the documentation to insure compliance with the stated policy and procedures. A new requirement called the Mission Element Need Statement (MENS) has been levied and is to be submitted for Secretary of Defense approval prior to Milestone 0 decision.

The MENS is designed to accomplish the following:

a. Identify the mission area and state the need in terms of the mission element task to be performed. The mission need shall not be stated in terms of capabilities, and characteristics of a hardware or software system.

b. Assess the projected threat through the time frame the capability is required.

c. Identify the existing DOD capability to accomplish the mission.

d. Assess the need in terms of a deficiency in the existing capability, a projected physical obsolecence, or a technological or cost savings opportunity.

e. State the known constraints to apply to the acceptable solution including operational and logistics considerations, requirements for NATO standardization or interoperability, limits on the resource investment to be made, timing, etc. These constraints will constitute boundry conditions for the exploration of alternative solutions.

f. Assess the impact of not acquiring or maintaining the capability.

g. Provide a program plan to identify and explore competitive alternative systems extending through to the next Milestone decision. Include the planning to establish a system program office. (20:3-4)

The procedures and approach for developing the MENS have not been well defined. Guidance to the Services is only marginal and consequently some difficulty has been encountered in establishing and meeting the criteria for MENS approval. At least two of the military Services have recently attempted to establish the need for new systems and these attempts have been unsuccessful because of the lack of a satisfactory MENS.

In a letter dated April 1977, Subject: Mission Need Statements and the "Type A" VISTOL Program, Secretary of Defense Brown concluded that a previously approved Mission Need Statement (MNS) for "Sea Based Air" was restrictive and not sufficient in the area of mission and threat determination. In broad terms the Secretary of Defense requested a reevaluation and new MENS for each mission element where the "Type A" VISTOL has potential application (21:1). This direction is unprecedented and has created apprehension among the Services. The concern pivots on the Service's ability to deal with a mission need and address deficiencies without specifying solutions. This problem has been particularly difficult since

the previous channels for developing needed hardware and systems have been altered.

Under the present administration the old methods of system acquisition are being changed, updated or replaced. It appears what is now desired is a revamping of the method for determining service needs, a fresh approach into planning and prioritization these needs and altering the budget methodology to accommodate these new concepts.

Air Force Planning, Programming and Budgeting

The Air Force's solution to PPBS and methods for development planning, program management and systems procurement appear to be tailor made for the new approach. Under the Planning, Programming and Budgeting System (PPBS) the Air Force provides a bottoms up estimate for achieving its annual budget. The Air Force, in the initial rounds of the PPBS cycle, aligns its programs to a budget bogie provided by OSD. Following a series of reviews the Program Objective Memorandum (POM) is directed through the Air Force Council, Chief of Staff and Secretary of Air Force and submitted for budget approval. While this system appears to be the least complicated and most streamlined among the services, there are certain inconsistencies and deficiencies which need to be overcome.

A New Approach

It is at this juncture that the author believes improvements can be made, new guidance implemented, and realignment accomplished so that the

Air Force process is closer to that desired by the administration and DOD. To deal with these problems the deficiencies require attention.

First, the identification of funds for a program is fragmented due to the method of accounting. The Air Force provides for new programs by itemizing through the various appropriations and requires separate Air Staff organizations to be key in the planning process.[1] The involvement of these organizations is cumbersome since the force structure planning and budgeting is carried out by these organizations with different major commands under different standards and restructions. While this approach amply meets the requirements for funding for a given system or program, it lacks in terms of assignment of priority. A form of what is needed to improve this system is already in being and exists in terms of the DOD program structure for the 10 program areas which encompass Strategic Forces through Support of other Nations.[2] The Air Force uses still another means to follow the DOD system and aligns its budget according to five essential mission areas. These mission areas are strategic (which is made up of the bomber and tanker forces, ICBM's and other categories), tactical air, mobility, defense wide intelligence and communications, and

---

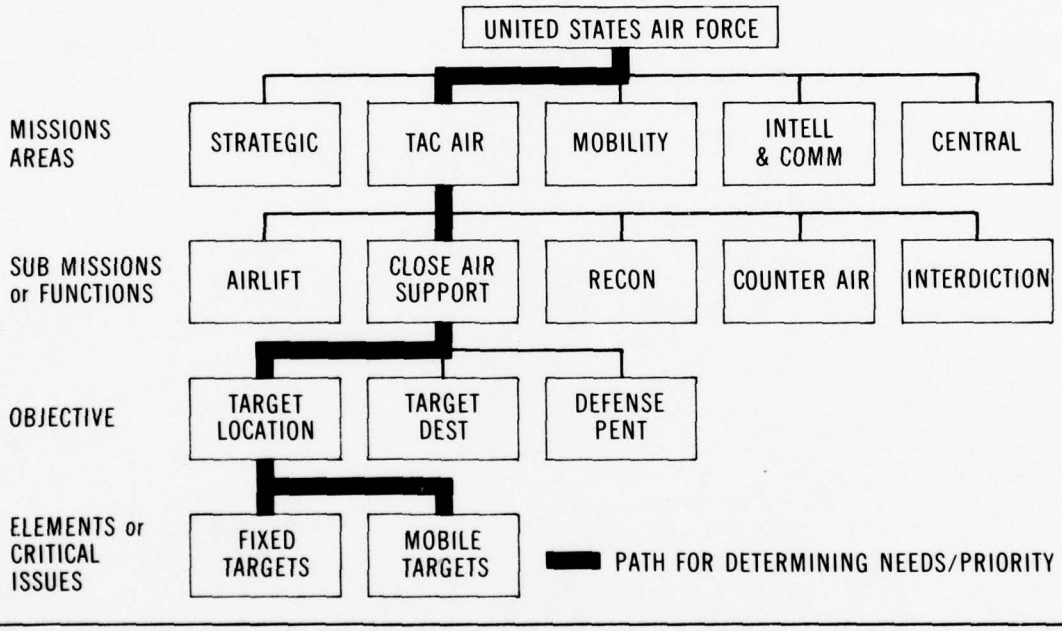
[1]The Air Force accounting system is aligned to appropriations as follows: 3010 Aircraft Procurement; 3020 Missile Procurement; 3080 Other Procurement; 3300 Military Construction; 3400 O&M, AF; 3500 Military Personnel, 3600 RDT&E; 3700 Military Personnel, AFR; 3730 Military Construction, AFR; 3740 O&M, AFR; 3830 Military Construction, ANG: 3840 O&M, ANG: 3850 Military Personnel, ANG: 0030 Retirement and 0070 Family Housing (22:58-66).

[2]The DOD program areas are as follows: 1-Strategic Forces: 2-General Purpose; 3-Intelligence & Communication; 4-Airlift/Sealift; 5-Guard and Reserve Forces: 6-Research & Development; 7-General Supply and Maintenance; 8-Training Medical Other Personnel; 9-Administration and 10-Support of other Nations (22:32-35).

a central category for accommodating as needed items. By using the mission area approach the Air Force can penetrate to the lowest tier necessary in search of critical needs. This structure is illustrated in Figure 19.

FIGURE 19.

MISSION AREA APPROACH



SOURCE (23:111)

Mission objectives can now be written in specific terms. In the example a comparison is needed to determine the importance of finding fixed versus finding movable targets in the close-air-support mission. Within this context the overall needs of the Air Force can be identified in terms of mission and can be ranked according to priority. While this approach serves to surface needs from the bottoms up through the mission areas it fullfills another function as well. To illustrate this point the overall

stragety and policy for the Carter Administration in terms of budget and long range planning is interpreted as being based on two concepts: (a) zero base budgeting and (b) the allocation of the total federal budget in a manner similar to and through a system like the DOD program structure of mission areas. Before covering point (b) a brief review of zero base budgeting is in order.

Zero Base Budgeting

In a nutshell, zero-base budgeting has been defined as:

> An operational planning and budgeting process which requires each manager to justify his entire budget request in detail from scratch [hence zero base] and shifts the burden of proof to each manager to justify why he should spend any more money at all. This approach requires that all activities be identified in "decision packages" which will be evaluated by systematic analysis and ranked in order of importance (24:12).

During the McNamara era the Department of Defense budgeting policy evolved from the old traditional approach of fixing on what was spent, extrapolating these spending levels, escalating them for various factors such as inflation, salary and wage increases, etc., and then adding for new projects and programs. During the early 1960's this system for budgeting was replaced with the current PPBS. However, the major emphasis here has been towards planning and the long range estimates for maintaining the military force structure. In general, it has accomplished the objective of formalizing the operating budget but usually lacked the indepth perspective into priority requirements according to mission areas. In the past, programs have been adequately identified, cost justification has been established

against strategic needs and in the majority of cases results in terms of a system has been the outcome. However, this methodology can and should be augmented. The continuing slowdown of resources due to the multitude of competing elements previously discussed and the requirements to improve the nation's investment policy dictate this course of direction.

A primary feature of the zero-base budgeting concept satisfies this requirement for augmentation. This feature is the identification of decision packages early in the planning cycle. These packages can be structured as was indicated in the case for mobile and fixed targets in the close-air-support mission area. Again, by employing this concept, the complete spectrum of issues at the lowest tier can be compared and a priority assigned. Through this system then a grass root or bottoms up determination on priority can be achieved.

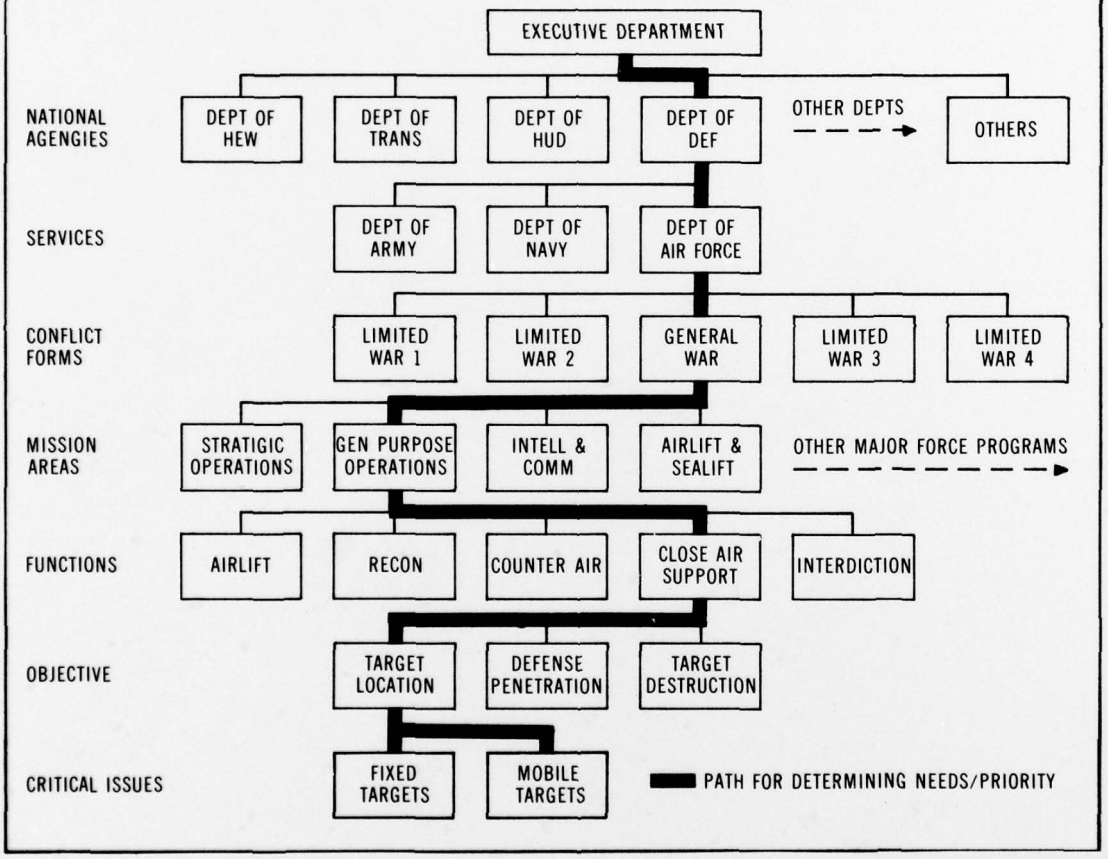
In general, the process then serves a two fold purposes. It provides an approach for priority in the case for zero-base budgeting and it also can be used to identify mission element needs in keeping with the requirement in DOD Directive 5000.2 It further serves to address the criteria and issues which were outlined in the Secretary of Defense letter of April 1, 1977, which was discussed previously.

The methodology for augmenting the AF, Services, and DOD needs can be expanded, and the hierarchy elevated to include the total Federal sector.

This proposition is displayed in Figure 20.

FIGURE 20.

EXPANDED MISSION AREA APPROACH



As was previously stated the problem under the specific mission area was to improve the force capability for defeating fixed and movable targets. Establishing a priority for the relative importance of each is essential

in the event that a deficiency exists. Once this priority is established it can be addressed in terms of a mission element need. Obviously this approach would allow a comparison across the services in terms of mission and in cases where similar needs exist joint efforts and priorities could be established. This system theoretically includes a comparison through the horizontal network and considers the needs of other sectors or agencies such as NASA, ERDA or the new energy administration. Furthermore, it provides identification in terms of resource allocation. Within this consideration the Federal Budget can be addressed and a first approximation made on fund distribution. In this case the flow is from the upper level of aggregation to the lowest tier. Using the arguments previously discussed in the trends section and assuming that the total Air Force budget bogie will remain at about 30 percent of the total budget, a fixed dollar amount can be allocated to each mission area. This amount can be further allocated to the lowest levels within the high level hierarchy structure. By following this technique a second check can be made. The estimating process conducted by the Air Force under the PPBS approach during the POM phase can be further corroborated. The question of how to best allocate each increment of money will always be difficult. Marginal benefits must somehow be addressed and the answer will usually be scenario dependent. However, the current procedures for budget allocation can be improved by taking the ZBB approach, structuring priorities from the grass roots level and reinforcing the PPBS process through the mission essential need statement. Tomorrow's program manager must understand this process and the

elements contained therein to be able to successfully compete for dollars for weapon system acquisition.

SECTION VI

A TEST CASE

The Very Large Airplane

In conclusion a hypothetical case will be discussed and tested against the requirement for ZBB and the MENS. Information contained in Rand's Report (R-1889-AF) dated December 1976 will be used extensively. This report deals with an Evaluation of Very Large Airplanes and Alternative Fuels. This report was the result of research conducted jointly by Rand and the Aeronautical Systems Division of the Air Force Systems Command under the Deputy for Development Planning (ASD/XR). This study contained a two fold objective:

a. Evaluate very large airplanes in the context of existing and potential future Air Force missions.

b. Determine the most attractive alternative fuels for airplanes of this type.

The potential need for this type of aircraft came to light as a result of the Air Force New Horizons II study. This study suggested that:

> ....the capability to deploy combat units worldwide, without reliance on foreign bases, may soon emerge as a definite requirement. Such an operational capability substantially exceeds that provided by any contemporary airplane. Rather, an airplane with a maximum gross weight in excess of one million pounds the working definition of a very large airplane (VLP) may be needed. Given historical trends, airplanes of this size could become operational as early as 1985.
>
> ....The widespread recognition of the ultimate depletion of U.S. petroleum resources further suggests that a very large

> airplane might benefit from the employment of a fuel other than a conventional hydrocarbon jet fuel (JP) refined from crude oil. Energy considerations are becoming increasingly important. In fact, the Department of Defense recently directed that the concept of energy-effectiveness be included with cost-effectiveness when the relative merit of alternative weapon systems is being judged (20:ix).

It is interesting to note that the needs stated here cross several domains. The application of this type of system could easily surface through mission area needs in the following categories.

1 - Heavy airlifter

2 - Tankers

3 - Missile launcher

4 - Tactical battle platform

5 - Maritime Air Cruiser

6 - Command, control and communication platform (C^3)

Technically, to comply with the intent of the DODD 5000.2 the MENS would be generated prior to considerations for hardware and could include any or all of the above six categories. In addition, it is conceivable that the Army could list airlift support as a mission need and the Department of Energy could test the development of alternative fuel sources for aircraft as a mission need. This need could also fall within the sector of a mission need from the Department of Transportation.

Each of these agencies could properly address the mission threat, requirement, existing and planned capabilities, assessment and impact of staying with the present capability, program plan to identify and explore competitive alternative system concepts and a general statement for

resources required to meet a Milestone I review.

Using the Air Force as the agent then the alternatives would follow the lines of those proposed in the study. Very large airplane (VLA) designs using either conventional hydrocarbon jet fuel (JP), liquid hydrocarbon (LH_2), or liquid methane (LCH_2) chemical fuels were three alternatives. A fourth alternative was added and consisted of a nuclear powered VLA. The life cycle cost estimates of each option is presented in Table 4.

TABLE 4.

VERY LARGE AIRCRAFT LIFE CYCLE COST ESTIMATES
(BILLIONS OF 1975 DOLLARS)

ALTERNATIVE	ACQUISITION COST	20 YEARS O&S	TOTAL LCC
VLA-JP	15.5	16.4	31.9
VLA-LCH_4	16.5	18.8	35.3
VLA-LH_2	13.6	21.3	34.9
VLA-NUC	32.1	24.6	56.7

NOTE: FOR 112 UE AIRCRAFT AT 2 HOURS PER DAY AVERAGE UE RATE

SOURCE (25:83)

Based on this information then the Air Force could proceed into the Milestone 0 phase. It is assumed that a need has been demonstrated, a priority assigned and, based on initial cost estimates, the impact of this program on the budget and force structure established. A program manager can now be selected! The test of the validity of this system now comes as the program evolves and proceeds through the acquisition cycle. If costs overwhelm priority or if other more cost effective options develop the

fate of the effort would obviously be determined. It would likely experience a demise similar to that of the B70, Skybolt, Manned Orbiting Laboratory (MOL) or any other technically feasible and desirable but cost prohibitive programs which have been cancelled prior to production.

SUMMARY

It is clear that the Soviets are investing heavily in defense. They have documented a policy of attaining both qualitative and quantitative weapon superiority. This situation has done little to promote detente. While the USSR continues to increase allocations for defense and spends a greater portion of its GNP for improving its weapon arsenal, the US is following a more conservative course. Our policy for defense has been structured as if detente existed. The president's proposal for a defense budget which grows at the rate of three percent per year in real terms allows for only limited improvements and restrictive growth. Liberal estimates assume that this country and the USSR are currently at parity in terms of national defense capability.

The threat trends indicate the need for force improvements, weapon system modernization and investments in equipment for defense. These goals will not be achieved unless new budget levels are authorized and implemented. The opportunity for any type of new major military weapon system hinges on this change.

We are maintaining a declining posture relative to the Soviets' technology and R&D for defense. They outstrip the US by over a factor of two in these areas. The viability of major weapon systems development pivots on improvement in the technology area.

Factors such as inflation, the pressures invoked by the social sector to diminish treasury outlays for military needs, and the drastic rise in the cost of military systems compound the problem. It is questionable that the proposed raise in the defense budget (three percent per year) can offset the problems brought on by these negative factors. Certain means do exist to cope with these burdens but no alternative on the horizon offers a total solution. Jointly funded programs, Foreign Military Sales (FMS), innovative incentive contracting, reduced system life cycle cost through improved management techniques are some of the more promising alternatives.

Cost avoidance appears to be the main benefit of the LCC approach The case for accruing savings thus allowing additional funds for systems acquisition is attractive but there are uncertainties. Feedback mechanisms must be improved to be able to draw firm conclusions about LCC. Moreover, the personnel portion of a systems LCC is essentially rigid and savings through manpower reductions are limited due to the impact on effectiveness. Energy factors play a role in the future since additional manpower may be required to function as a substitute for machines which require fossil fuel for operation.

Military service needs and the weapon systems acquisition process are going to be severely tested as a result of the Mission Element Need Statement (MENS). Zero Base Budgeting (ZBB) offers what could be constructive changes to the planning, programming and budgeting process. However, the full impact of the MENS and ZBB is unknown. The Air Force has been using an approach similar to ZBB and appears to be the best prepared service

to implement the new requirement. Identification of priorities for systems needs are a key feature of the ZBB method. Using ZBB as a baseline and following a top down process has the potential for a fixed budget operation which could be applied to the DOD and military services by the administration.

Using this approach, the three percent growth rate for defense could be closely monitored and allocations to priority packages within key decision units could be carefully apportioned. This method presents an opportunity for improved reprogramming and possibly more efficient outlays if additional funds are needed for systems acquisition.

In conclusion future program managers will be faced with known elements and trends which decrease the chance for successful program completion. The uncertainty and unknown elements are there also. These circumstances mitigate against the case for large weapons system procurement. Moreover, the balance is driven further in an unfavorable direction since the solution to the problem is mainly time and money and the forecast is for limited funds and insufficient time!

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STUDY PROJECT PROPOSAL FORM

PARTICIPANT:	ADVISOR:	DATE:
LT COL AL HIGGINS	MR BILL CAMM	16 SEPT 1977

STUDY PROJECT TITLE: AN OUTLOOK ON FUTURE WEAPON SYSTEM ACQUISITION

OVERALL PURPOSE OF PROJECT: (What plan to learn and Why) TO ESTIMATE THE FAR TERM IMPACT OF THE CONTINUING RESTRAINTS ON THE ANNUAL DEFENSE BUDGET, IN ADDITION, HIGHLIGHT AREAS WHICH POTENTIALLY COULD BENEFIT AIR FORCE WEAPON SYSTEM ACQUISITION STRATEGY AND POLICY

SPECIFIC STUDY PROJECT GOALS: (to be achieved or questions to be answered)

GOALS WILL INCLUDE AN OVERVIEW OF ALTERNATIVES AND OPTIONS FOR CONTINUING SYSTEMS ACQUISITION TO INSURE AN ADEQUATE AND VIABLE USAF STRUCTURE THROUGH THE 1990 TIME PERIOD

PROJECT AND REPORT BODY ALTERNATIVE TO BE USED: LEARNING PAPER

STUDY METHODS TO BE USED AND DATA SOURCES:

CONDUCT A LITERATURE SURVEY OF TRENDS AND FORECASTS OF FUTURE THREATS, ECONOMIC CONSTRAINTS AND ENERGY IMPACT ALSO CONDUCT REVIEW OF CURRENT ACQUISITION DEVELOPMENTS. THIS PAPER WILL ADDRESS SELECTED TOPICS AND TRENDS REGARDING MANPOWER REDUCTIONS AND OTHER FACTORS WHICH MAY BE ALTERED TO COMPLY WITH SOUND ACQUISITION POLICY.

INTERVIEWS WITH HQ USAF PLANS, HQ AFSC ACTION OFFICERS AND PROJECT PERSONNEL ARE SCHEDULED, FUTHERMORE MEETINGS WITH SELECTED INDUSTRY AND AFSC INDIVIDUALS ARE ANTICIPATED.

TENTATIVE OUTLINE OF PROJECT REPORT: (Be as specific as possible.)

I INTRODUCTION
II PURPOSE
III DISCUSSION
IV THREAT TRENDS
V TECHNOLOGY TRENDS
VI OTHER FACTORS & ISSUES
VII IMPACT OF TRENDS ON SYSTEM ACQUISITION
VIII ACQUISITION ALTERNATIVES
IX CONCLUSION

KEY MILESTONES: (Include schedule to typist.)

DOCUMENT / LITERATURE SEARCH	WK 1-3
INTERVIEW	WK 5-9
DRAFT REPORT	WK 12
SMOOTH DRAFT TO TYPING	WK 13
TURN IN FINAL REPORT	WK 16

Progress review milestones: Weeks 7, 9, 12.

DSMC Form 23 (6 Jul 77)