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JOINT SERVICE ACQUISITION: AN ESSENTIAL STRATEGY,
FUNDAMENTALLY FLAWED

by

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guidance and organizational infrastructure, until fundamental problems in the selection and initiation of joint Service programs are corrected, joint Service acquisition will remain an elusive strategy. This research recommends establishing joint Service-specific policy guidance which would create formal and standard processes for the selection and initiation of joint Service acquisition programs. Key products of this research are proposed joint program selection criteria and proposed mandatory "exit criteria" for Milestone II.

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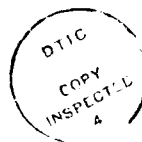
Abstract of
JOINT SERVICE ACQUISITION: AN ESSENTIAL STRATEGY,
FUNDAMENTALLY FLAWED

To satisfy the demands for increased "jointness" among the Services and for more efficient use of defense resources in an increasingly constrained fiscal environment, joint Service acquisition is an essential acquisition strategy to be considered for future defense systems. Historically, however, the potential benefits of this attractive strategy have been elusive for major systems acquisition. This research identifies fundamental problems which have impeded joint Service acquisition of major systems, reports on recent changes designed to eliminate some of these problems, and highlights critical areas that need further improvement. The research concludes that while some progress has been made in providing policy guidance and organizational infrastructure, until fundamental problems in the selection and initiation of joint Service programs are corrected, joint Service acquisition will remain an elusive strategy. This research recommends establishing joint Service-specific policy guidance which would create formal and standard processes for the selection and initiation of joint Service acquisition programs. Key products of this research are proposed joint program selection criteria and proposed mandatory "exit criteria" for Milestone II.

PREFACE

Conducting research on a contemporary issue, especially one with the Presidential priority, the volatility, and the far-reaching implications of "acquisition reform", is problematic. While the problems surrounding joint Service acquisition are historical in nature and documented, the solutions are/will be the product of an on-going reform process. As with any evolutionary process, the output will change over time. This report assesses the output of the reform process at a given point in time--June 1990. It does not speculate on reforms that may be "in draft" or "in coordination". Therefore, the reader should be aware that additional reforms may be instituted by the time this report is published.

In any event, this interim assessment does not criticize what has already been accomplished, for most of these changes provided much needed acquisition policy guidance and oversight. Rather, this interim assessment provides a useful benchmark for what remains to be accomplished. Thus, this research is an attempt to actively participate in the on-going reform process and to influence it in a positive way, rather than to critique the attempts of others after the fact.



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JOINT SERVICE ACQUISITION: AN ESSENTIAL STRATEGY, FUNDAMENTALLY FLAWED

CHAPTER I

INTRODUCTION

The Problem. Recent world events and contemporary defense issues have increased the demands on the Department of Defense (DOD) to make more effective and efficient use of scarce defense resources. First, the U.S. public's perception of a decreasing Soviet threat combined with the large federal deficit and no new tax increases all portend a shrinking defense budget for the foreseeable future. Second, recent legislation has rekindled congressional demands for increased doctrinal emphasis on joint warfighting and interoperability among the Services, and for greater cost-effectiveness in military procurement.¹ Finally, the presidentially commissioned Packard Report reemphasized the need for acquisition reform and increased DOD oversight.²

Faced with this fiscal reality and these congressional imperatives, the concept of two or more Services jointly developing and procuring systems for common use will become an increasingly attractive, if not essential, acquisition strategy through the turn of the century. Ideally, similar, single Service programs merged into one joint program have the potential for substantial cost savings while increasing commonality and interoperability. Joint Service acquisition

appears to be a straightforward, business-like solution: combine the partly complementary, the partly substitutable, and the technically similar into fewer types; use common parts; and save considerable money.

In reality, however, joint Service programs are not so straightforward. Historically, the potential benefits of this attractive strategy have proven elusive for major systems.³ To quote a former DOD executive, "It's (joint programs) a snare and delusion. What you get is high cost, lost opportunity cost, system elaboration, and in the end, no product. Joint programs use up lots of money and lots of executive time."⁴ Therefore, while recent trends suggest an increase in joint Service development and procurement programs may be appropriate, unless the problems that have historically plagued joint programs can be identified and corrected, the potential efficiencies will continue to elude us.

Purpose. The purpose of this research is threefold: first, to examine previous studies on joint Service programs and identify the fundamental problems impeding their success; second, to assess the impact of recent changes that have been implemented to eliminate these problems; and finally, to highlight critical areas that are candidates for further improvement. The ultimate goal of this research is to actively participate and influence in a positive way the ongoing defense management and acquisition reform processes.

Scope. As with any study of this nature, the scope of the effort must be defined. Terminology was one of the first obstacles to understanding the problems surrounding joint programs. Joint programs can be grouped into several categories based on "who" the participants are, "what" the nature/scope of the program is, and "where" (timing) they are in the acquisition cycle.

Who participates in a joint program is important to establish since the policy and the problems can be different depending upon who the "players" are. Joint programs exist between: DOD and other U.S. Government agencies; non-DOD U.S. Government agencies (State and Treasury); DOD and other nations; the Service components within DOD; etc. This study will focus on defense programs conducted between two or more Service components--joint Service programs.

Based on their scope/nature, joint Service programs can be categorized into four groups: major systems; non-major systems and subsystems; components; and technology base programs. Those programs that meet the cost and priority criteria as defined in DOD Directive 5000.1⁵ are designated major systems. Non-major systems and/or subsystems are those complete, fully-functioning systems that do not meet the criteria of a major system, or those constituent elements of a major or non-major system that constitute a significant portion of the complete system's value and perform a major function (e.g., an aircraft engine). Components are those

constituent elements of a complete system or subsystem that constitute a small portion (less than 5 percent) of the value of the system or subsystem and perform a generic function (e.g., a microprocessor). Technology base programs are research and development programs that will advance the state-of-the-art in a specific military mission, but without necessarily proceeding beyond the prototype stage (e.g., high energy lasers). This research will focus on those programs qualifying as major systems.

The term "acquisition" was also problematic since, in the broadest interpretation, acquisition spans the entire life of a system. Joint programs have been established (and terminated) in several stages of the acquisition process--concept exploration (CE), demonstration and validation (DV), full scale development (FSD), and production. This research will focus on the problems associated with selecting and initiating joint programs during the early stages of development (CE through the start of FSD).

In sum, this research concentrates on problems associated with the selection and initiation of "joint Service acquisition" programs in general, and more specifically, on those programs qualifying as "major systems" in accordance with DOD Directive 5000.1. Furthermore, for the purposes of this report, acquisition is limited to the early stages of development, concept exploration through the beginning of full scale development.

Methodology. This research consisted of a detailed literature search on joint Service acquisition problems, a review of DOD's and the Services' acquisition policy and directives, a review of the Services' requirements directives, and a review of legislation and other literature dealing with the general topic of "DOD Acquisition Reform". In addition, several interviews were conducted with individuals in the Services and JCS who are responsible for joint program requirements, joint program selection, and joint program management.

Organization. Following this introductory chapter, Chapter II provides additional background on the impact of recent defense trends on the acquisition reform process, explains why joint programs will become an attractive, if not essential, acquisition strategy, and summarizes the results of several studies on joint Service acquisition problems. Chapters III and IV address in more detail the fundamental problems surrounding joint program selection and initiation, respectively. These chapters also examine what corrective actions have been implemented and highlight those areas that are candidates for further improvement. Chapter V draws conclusions from the research and makes recommendations for continued improvement in joint Service acquisition.

CHAPTER II

JOINT SERVICE ACQUISITION: A "CANCER" OR A CURE

Contemporary Trends. In 1986 the President and the Congress approved two historic initiatives aimed at improving defense management. In February 1986, the President's Blue Ribbon Commission on Defense Management (The Packard Commission) issued its Interim Report to the President which offered sweeping recommendations to enhance the budgeting process and the acquisition of defense systems. In April 1986, the President issued National Security Decision Directive (NSDD) Number 219, directing DOD and other responsible Executive agencies to implement virtually all of the recommendations contained in the Interim Report that did not require legislative action. Later in April, the President sent a message to Congress requesting the early enactment of legislation to enact the balance of the recommendations.⁶

In September 1986, Congress passed Public Law (PL) 99-433, the Goldwater-Nichols Department of Defense Reorganization Act, which not only mandated major changes in the DOD organization, but also contained provisions to increase the "jointness" among the Services, to improve interoperability, and to reduce Service parochialism in the acquisition process.⁷

The Packard Commission and the Goldwater-Nichols DOD Reorganization Act resulted from a period of intense

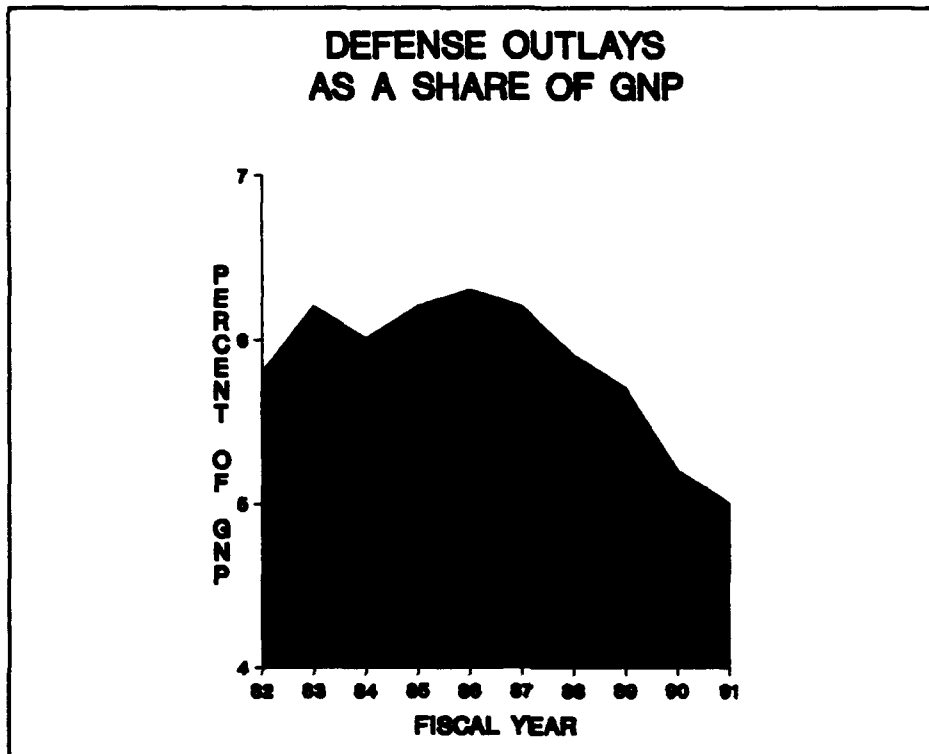
frustration with the defense establishment. To be sure, efforts to reorganize the Department of Defense have existed since its creation in its present form by the National Security Act of 1947 and the Reorganization Act of 1958. "But clearly, if the President of the United States was compelled to establish a Blue Ribbon Panel on Defense Management and one of the military's most ardent supporters in the Congress, Senator Barry Goldwater, was compelled to lend his name and prestige to legislation for defense reorganization, then something was seriously wrong."⁸

More recently, in July 1989, Secretary of Defense Cheney forwarded the results of the Defense Management Review (DMR) to the President for his approval. One major facet of DMR set forth a plan "to implement fully the Packard Commission's recommendations, to improve substantially the performance of the defense acquisition system, and to manage more effectively the Department of Defense and our Defense resources."⁹

Complementing these Presidential, Congressional, and DOD initiatives for a more efficient defense acquisition system is the U.S. public's perception of a decreasing Soviet threat leading to expectations of reduced defense expenditures and a corresponding "peace dividend". Additionally, a massive U.S. federal deficit, the President's pledge for no new taxes, and the Gramm-Rudman-Hollings Balanced Budget Amendment all portend a shrinking defense budget for the foreseeable future.

FIGURE 1 illustrates the U.S. defense budget trends.¹⁰

FIGURE 1 DEFENSE BUDGET TRENDS



Seemingly incompatible with the trends just mentioned, the U.S. will need to maintain its world position as a military power. Deterrence, both nuclear and conventional, remains the cornerstone of our national military strategy.¹¹ Moreover, qualitative, technological superiority has been and, most-likely, will continue as the means by which the U.S. compensates for quantitative imbalances vis-a-vis other world powers. Finally, as existing defense systems reach the end of their projected life expectancies, or become technologically

obsolete, they will need to be replaced with modern (more expensive) systems.

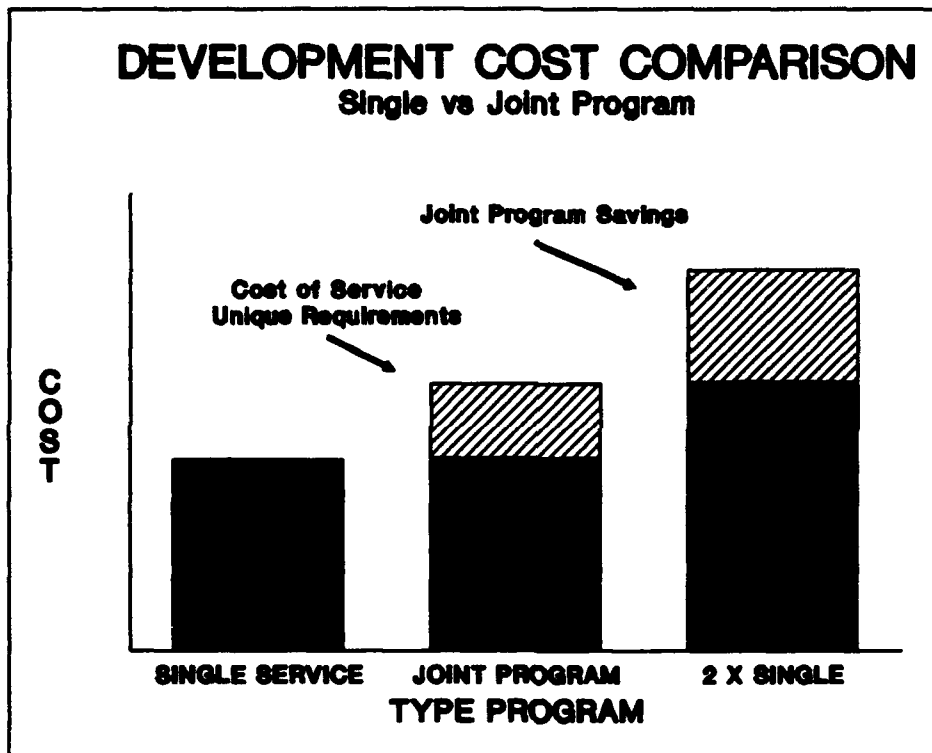
These tenets of our balanced defense posture remain valid despite projected force structure reductions. Force reductions will tend to accentuate the importance of these tenets to our national security while at the same time increasing the pressure for more efficiency in defense acquisition. How can the Department of Defense possibly accommodate these contradictory trends?

An Attractive Remedy?. One acquisition strategy with real potential for reducing the cost of modernizing and maintaining our military, while at the same time increasing Service interoperability and acquisition efficiency, is joint Service programs. Intuitively, the concept of two or more military Services working together to develop and procure major systems for common use is an attractive one. Duplicative development, production, and operating costs should be avoided.

Development cost savings in joint programs should result from not duplicating development efforts. The cost of developing a joint system to meet the needs of two Services should be less than the cost of developing two separate, but comparable systems. Development costs for a joint program, however, could be somewhat higher than the development costs for one single Service program of similar scope due to incremental costs associated with incorporating any Service-unique requirements of the participants. Thus, joint program

development costs might be somewhat higher than those of a comparable single Service program, but overall will be substantially lower than the total costs associated with two independent single Service developments. These development cost relationships are illustrated notionally in FIGURE 2.¹²

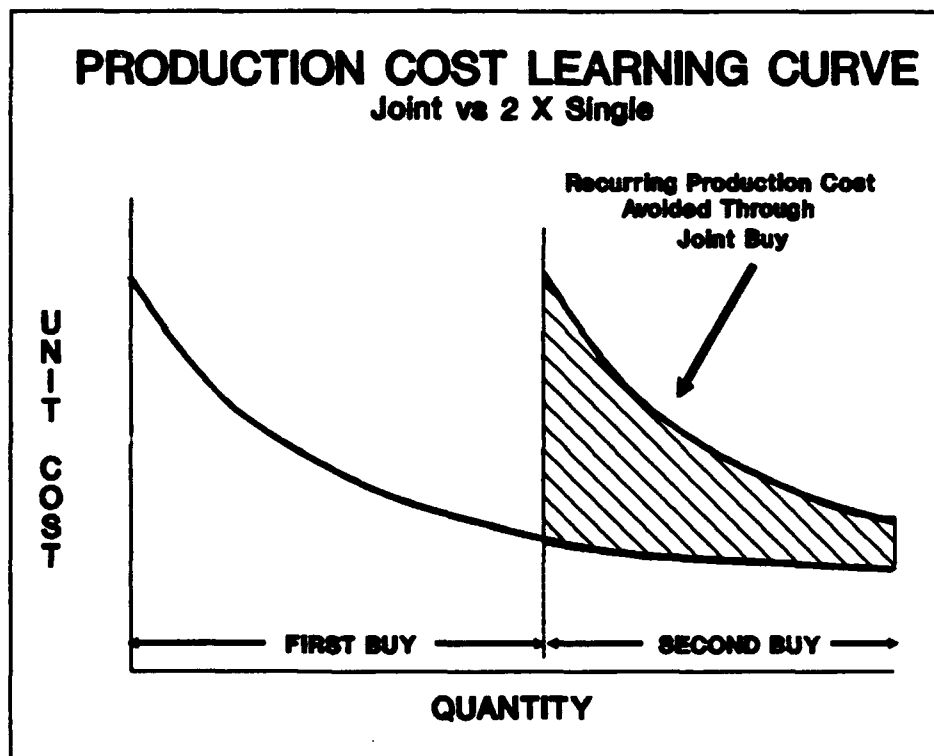
FIGURE 2 DEVELOPMENT COST SAVINGS



Production cost savings for joint programs should accrue by avoidance of non-recurring costs (production set-up costs) and from reductions in recurring costs due to learning curve effects and more efficient production rates. For example, a production facility with sufficient tooling and production line capacity to handle the combined requirements of two or

more Services will generally require less non-recurring investment than two or more separate lines of lower capacity. Recurring production cost savings are realized by taking advantage of the reduction in unit costs that occurs as the cumulative number of items produced in a given line increases, the so-called "learning curve effect". The potential savings that can result from a combined buy are illustrated notionally in FIGURE 3.¹³

FIGURE 3 PRODUCTION COST SAVINGS



The area under the curve from the origin to any point on the horizontal axis represents the total recurring production cost for that quantity. The production cost which can be avoided

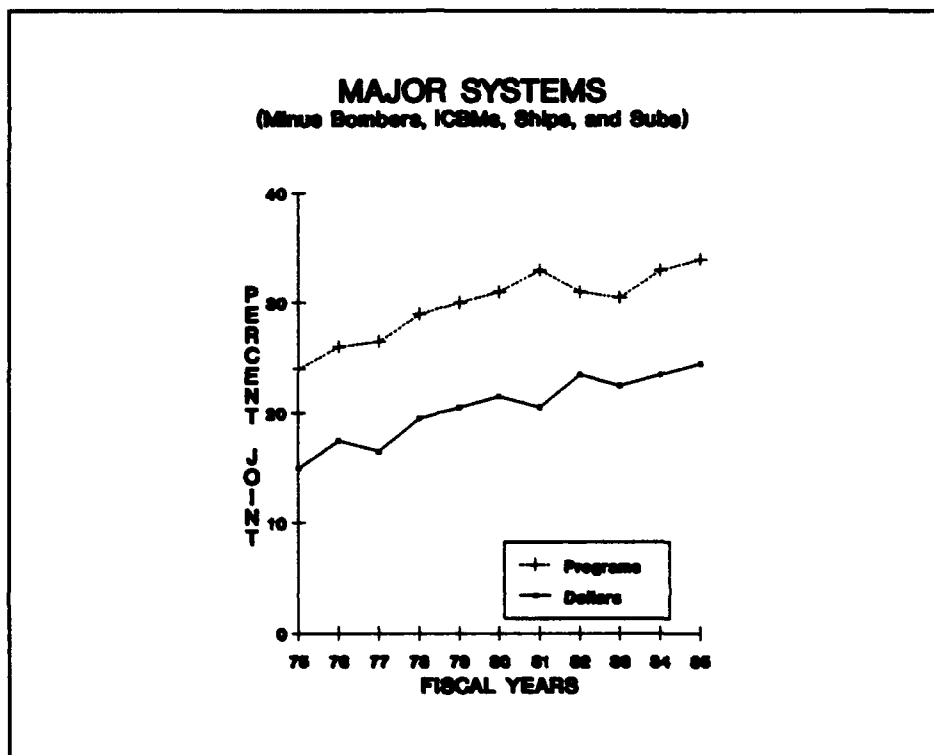
by combining two equal quantities on the same production line is illustrated by the hatched area below the second learning curve. In sum, the second buy on an established production line takes advantage of the "learning" achieved during the first buy. Unit costs are significantly below those which would be experienced by starting a second or third line.

Joint programs also present opportunities for reduction of both recurring and non-recurring operation and support (O&S) costs. Recurring O&S cost savings can be realized through acquisition of common spares. Larger combined spares buys provide opportunities for cost reduction through learning curve effects and economies of scale. Non-recurring cost avoidance can occur through such practices as multi-Service utilization of common technical manuals, joint depot servicing, and use of common test equipment and tooling.¹⁴

In addition to these potential cost savings, joint programs should enhance interoperability among the Services due to the development of common technologies, the procurement of common hardware, and the utilization of common support. Even more encouraging, the last decade has shown that, as a percentage of all major weapons systems programs, joint programs have increased in both dollar amounts and actual numbers. This trend is even more significant when programs not eligible for joint status (e.g., ships and strategic bombers) are removed from the total. FIGURE 4 shows these adjusted trend lines. Note that the trend is increasing and

that in 1985 joint programs represented 24 percent of the dollar value and 32 percent of the total number of programs.¹⁵

FIGURE 4 JOINT PROGRAM TRENDS



In sum, while contemporary trends are pushing DOD towards more efficiency in defense acquisition and more jointness in defense operations, it has been shown that joint Service acquisition can potentially satisfy both of these demands, and that the number of joint programs has been steadily increasing. Unfortunately, these potential benefits have seldom been realized. Studies show that although joint programs provide the potential for tremendous benefits, they

also bring to acquisition management an entirely new set of challenges and problems.

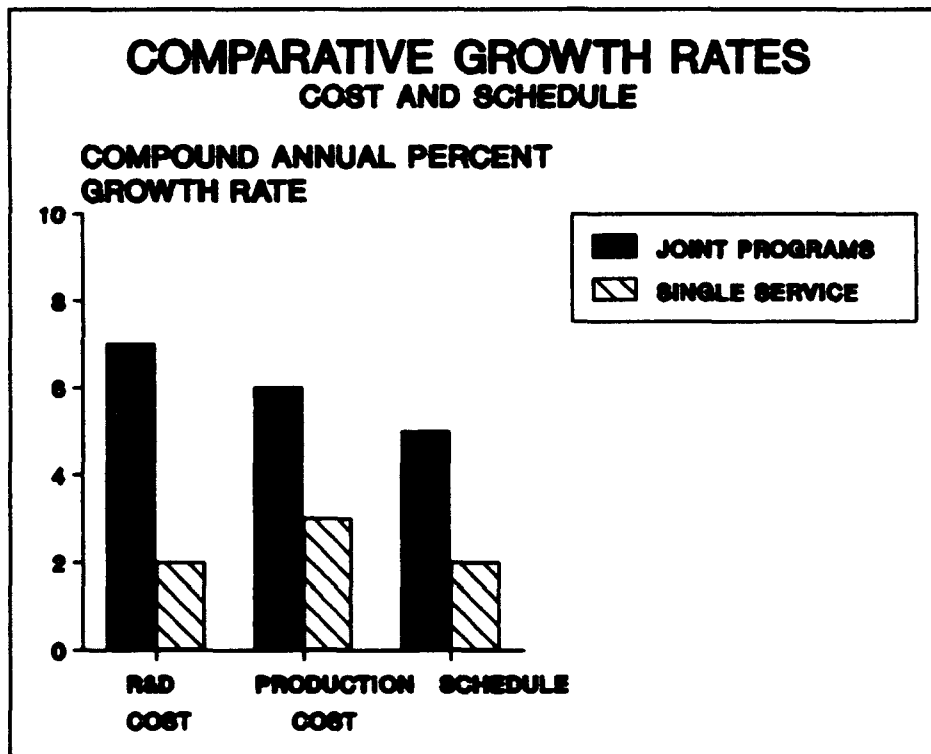
An Insidious Cancer?. A detailed literature search on joint program acquisition revealed only a limited number of documents written on the subject. Most only address problems specific to a particular weapon system (e.g., F-111 or cruise missiles). Others had insufficient quantitative data to be useful as a tool for analysis on joint programs. Three major studies, one by the General Accounting Office (GAO)¹⁶, one by the Defense Science Board (DSB)¹⁷, and one by the Joint Logistics Commanders (JLC)¹⁸ provide the bulk of the data for this report.¹

Surprisingly, while each study had a different perspective (organizational bias), different scope, and different definition of success, the fundamental problems they identified were the same and manifested themselves in the same way: increased development costs, increased production costs, schedule slippage, and high incidence of participating Service withdrawal. More than 25 percent of the major joint programs directed by Congress or OSD experienced participating Service withdrawal. Moreover, the average annual development cost growth rate for major joint Service acquisition programs were 3.5 times greater than that of the average single Service program. Average production cost growth rates and average

¹ Appendix I contains a synopsis of the scope, key definitions, and the results of these three major studies.

schedule slippage were double those of single Service programs (FIGURE 5).¹⁹

FIGURE 5 COMPARATIVE GROWTH RATES



Clearly, the potential cost benefits of joint programs are quickly lost if they experience cost growth rates and schedule stretch-outs of this magnitude. Moreover, any savings shown in development are academic if no joint system is ever produced or it is produced in uneconomic quantities/rates due to withdrawal of a participant. It is this dismal track record that has led many to believe that joint programs are an insidious "cancer". To quote a former DOD executive, "It's (joint programs) a snare and delusion. What you get is high

cost, lost opportunity cost, system elaboration, and in the end, no product. Joint programs use up lots of money and lots of executive time."²⁰

The cost growth, the schedule slippage, and the program withdrawals, however, are merely the visible symptoms, the manifestations, of the much more fundamental flaws/causes. TABLE I summarizes the major problems encountered by joint programs with regard to program selection and initiation. These problems and their potential solutions will be the subject of the following chapters.

TABLE I. FUNDAMENTAL FLAWS

- **Joint Program Selection**
 - **No formal OSD policy**
 - **No joint requirements process**
 - **No formal selection criteria**
 - **No supraservice "umpire"**
 - **Joint Program Initiation**
 - **No effective policy guidance**
 - **No jointly-approved charter**
 - **No Service commitment**
-

CHAPTER III

JOINT PROGRAM SELECTION: "THE" FUNDAMENTAL PROBLEM

Why It's Been Problematic. The selection process is the cornerstone of the joint Service acquisition program. It is as fundamental to the ultimate success of a joint program as a stable foundation is to the structural integrity of a building. If the selection process is done poorly, then the "foundation" upon which the rest of the program is built will eventually fail. The following paragraphs provide a synopsis of how major joint Service programs have been selected. These paragraphs also serve as a useful outline for addressing the problems with that selection process.

From a historical perspective, virtually all joint program problems stem from inattention to the front-end work so necessary to establishing a firm foundation for a joint program. Acquisition policy/guidance with respect to joint Service program implementation did not exist. There was no formalized joint requirements process, no standard joint program selection criteria, and no supraservice organization with the means and the sustained "clout" to provide joint program direction and oversight.

In this policy vacuum, the Services had the initiative for joint program initiation. Each Service's unique requirements and acquisition processes, however, were not oriented toward that end. The Services tended to advocate their own Service-

specific solutions in response to operational needs. This led to apparent duplications of effort in the development of new systems.

To combat this apparent duplication of effort, Congress and OSD directed the merging of several high priority programs into major joint Service acquisitions. "Harmonization" of the Services' missions, doctrines, requirements, priorities, need dates, or budgets were often relegated to distant second-order effects to be considered after the potential cost savings. These "forced marriages" were thrust upon the Services to manage using essentially the Service-unique acquisition procedures of the "lead" Service.

No Formal OSD Policy. DOD Directive 5000.1 and DOD Instruction 5000.2, which provide policy and implementation instructions for DOD Systems Acquisition, provided no formal policy, no direction, and no specific implementation guidance for joint Service acquisition.²¹ This deficiency in the DOD policy reflected a lack of understanding of the nature of joint acquisition programs and how they differ from single-Service programs. The policy did not recognize or provide for the increased complexities, unique demands, and new challenges associated with multi-Service acquisition of major systems. This policy void resulted in an ad hoc approach to the selection of joint programs which is inconsistent with sound acquisition management.

No Joint Requirements Process. "The most critical aspect in commencing a joint Service acquisition program is the delineation of the needs of each participating Service and the resolution and harmonization of those needs into a specific requirements statement".²² However, no formal, structured joint requirements process existed to recommend programs to be merged. By default, the responsibility for initiating joint Service programs and harmonizing the requirements fell to the Services. However, each Service, with its finely drawn doctrine, unique capabilities, and particular operating/technical needs ensured that the requirements for any new capability conformed to its view of defense missions and priorities.²³ Each Service tended to generate Service-peculiar requirements documents which had Service-specific requirements and were system-oriented (vice mission-oriented).

The Services' requirements documents were forwarded to the other Services for review and comment, however, there was little incentive to identify joint program opportunities. A Service's autonomy, its total operational control over its own forces and funds, is enhanced by Service-specialized systems. Joint acquisitions, on-the-other-hand, are a committee product, a compromise of a Service's requirements, and a dilution of control of its resources. The requirements review processes were largely single Service-oriented and were not structured or motivated to identify joint program

opportunities. In sum, the Services' "...requirements processes were largely ineffective in identifying potential joint program opportunities [and] review of other Service requirements [was] very perfunctory, with little meaningful feedback".²⁴

This ad hoc approach resulted in the apparent duplications of effort among the Services' development programs. OSD and Congress, in an attempt to reduce these apparent duplications, initiated a large number of major joint Service programs.¹ However, there was no effective process for systematically reviewing potential candidates and arriving at a recommendation for or against jointness.

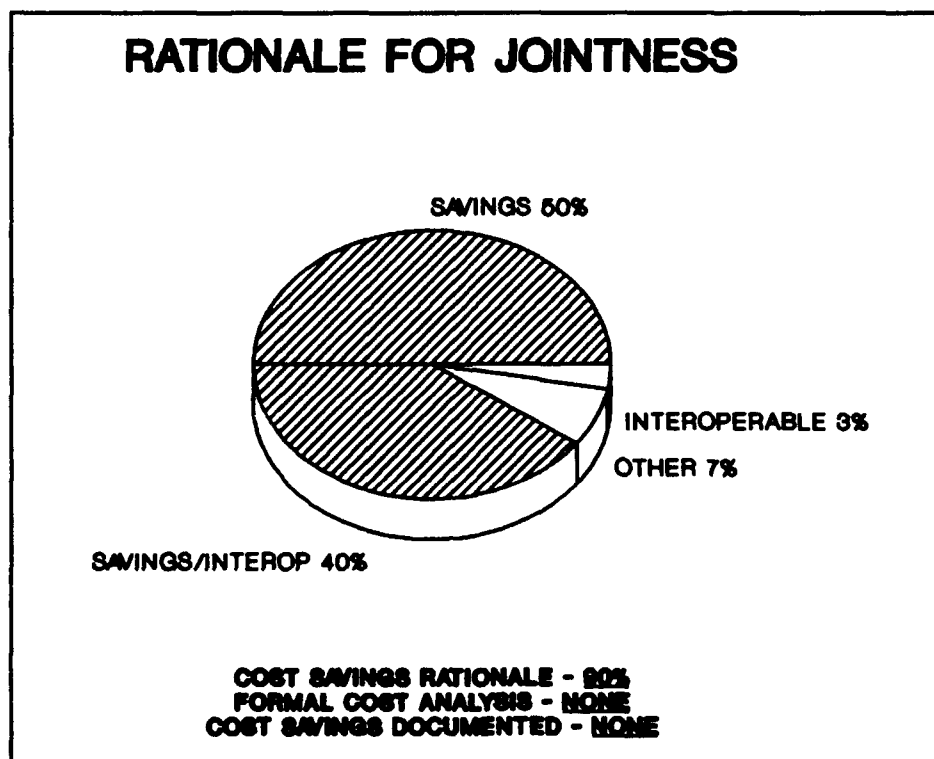
No Formal Selection Criteria. The absence of a formal selection process and criteria resulted in joint program mergers based on intuition rather than analysis. Additionally, key prerequisites for a successful joint program (e.g., common mission, common priority, etc.) were often not addressed prior to the decision to merge Services into a joint program, or were relegated to distant, second-order factors to be considered after potential cost savings.

The most dominant rationale for jointness was clearly the achievement of cost savings. The second most important

¹The JLC study showed that 73 percent of the major joint service programs were initiated by external sources (i.e., OSD and Congress). This supports the subjective findings of other reports which suggests that the Services have been reluctant to take the initiative in establishing major joint programs.

objective was achievement of cross-Service interoperability for systems such as communications and intelligence distribution networks that serve the needs of multiple Services. In most cases where interoperability objectives were cited, the goal of cost savings was also cited. Amazingly, "...not one program was able to produce documentation of any kind of comparative cost analysis of joint versus parallel single Service program strategies, [and] no program had attempted to document savings actually achieved through jointness".²⁵ FIGURE 6 illustrates the dominance of the cost saving rationale in the selection process and the corresponding absence of any cost analysis.²⁶

FIGURE 6 JOINT RATIONALE



The premise of a joint program is that there is sufficient commonality in the Services' missions, doctrine, requirements, need date, and priority that a joint effort would be beneficial. In the past, a number of programs were merged without adequate preparation or analysis of these prerequisites for Service commitment and joint program success. For example,

"To cut down on attack aircraft variety and to save the costs of developing a new plane, the Air Force was pressed to buy the Navy's A-7, already operational. However, the A-7 airplane was then customized to suit Air Force doctrine [emphasis added], doubling its cost and reducing its commonality with the Navy's A-7 to 40 percent."²⁷

"In the TFX (F-111) program to develop a fighter aircraft for both the Air Force and the Navy, the requirements were often in flux during the development, but essentially both Services' performance needs [requirements] were not aerodynamically compatible in a single aircraft."²⁸

"The Joint Tactical Information Distribution System [JTIDS], is [was] a coalescence of systems in different development stages [different need dates]. By merger time, contractors had already sunk millions on their various system concepts. It took 2 years to reach agreement on the joint program charter. The Services were also reluctant to release development money for the program. Few, if any, joint mission analyses were done."²⁹

"...In 1982 OSD ordered the merger of the Air Force's Pave Mover and the Army's Battlefield Data System (now JSTARS)...the Pave Mover is more complicated and expensive than the Army wants or is willing to pay for [different priority]...What is cheaper and faster for the Army, however, may be more expensive, slower, and have less growth potential for the Air Force".³⁰

Failure to adequately address these important criteria during the selection process has led to requirements, schedule, and

funding turbulence during the execution of the program; and has led to Services withdrawing from joint programs.¹

No Supraservice Umpire. Resolving all of the selection criteria to the satisfaction of each participating Service would represent an arduous, if not impossible, task. In all joint programs there are compromises, trade-offs, and changes. What has been lacking is a formal, institutionalized supraservice "umpire" to seek out the most promising opportunities for joint programs, to sponsor requirements and management analyses to justify the merger, and to negotiate and/or resolve intra-Service disputes throughout the life of the program.

OSD has tried to settle conflicts over technical and operating requirements which the Services cannot resolve on their own. Multi-Service agreement on OSD-directed changes, however, is very difficult to bring about if one Service perceives a threat to what it considers to be "its mission". Moreover, while the Secretary of Defense has the legal power to curtail, transfer, or abolish programs, these options have been used sparingly. The Secretary may "ramrod" an occasional change or compromise, but if it is not acceptable to the

¹In the joint Air Force/Navy development of the F-100/F-401 aircraft engine intended for the F-15 and the F-14 fighters, the Navy came to believe that the engine would not be right for its needs and pulled out of the program. More recently, the Army, who was the lead service for the development of the J VX (Osprey), withdrew from that program due to a change in its priorities. The Air Force withdrew from the joint development with the Navy of the Advanced Self Protection Jammer (ASPJ).

Service bureaucracies, it has been diluted at lower levels, or "outwaited" and reversed when the Secretary's term is up. Consolidating rival Service systems has been very difficult for the Secretary of Defense and remains a major challenge.³¹

The JCS had the potential to resolve disputes over joint Service requirements and program priorities; however, until recently the JCS was not set up or sufficiently detached from the Services to be able to resolve such conflicts or recommend one Service's concepts over another's. The Chairman of the JCS was the only officer in DOD in a supraservice position. Former Chairman of the JCS, General David C. Jones, noted:

"...the lack of adequate questioning by military professionals results in gaps and unwarranted duplications in our defense capabilities. What is lacking is a counterbalancing system involving officers not so beholden to their Services who can objectively examine strategy, roles, missions, weapon systems...to offset the influence of the individual Services".³²

A Reformed Selection Process. Beginning in 1986, the way major programs were reviewed and selected to become joint Service acquisition programs was significantly reformed. Two driving forces for this reform were the President's Blue Ribbon Commission on Defense Management (The Packard Commission) and the Goldwater-Nichols Department of Defense Reorganization Act of 1986. Significant changes that directly impact on the joint program selection process are: the creation of the Under Secretary of Defense (Acquisition), the establishment of the Defense Acquisition Board (DAB), and the

expanded roles of the Chairman, Vice Chairman, and Joint Requirements Oversight Council (JROC).

Under Secretary of Defense (Acquisition). The position of the USD(A) was established within OSD in September of 1986. In meeting the intent of the Congress and the Packard Commission, the USD(A) has policy and procedural authority for the defense acquisition system. Accordingly, the USD(A) is the principal acquisition official of the Department of Defense and is the acquisition advisor to the SECDEF.

The USD(A) provides the organizational structure within OSD and the Department-wide policies regarding how equipment is developed and procured. It is significant that DOD Directive 5000.1 and DOD Instruction 5000.2 were both updated shortly after the creation of USD(A) and both of them address "common-use" (joint service) systems.

In addition to establishing DOD acquisition policies, USD(A) is responsible for managing the structure and processes through which acquisition decisions are made and implemented. One notable change in the structure and process that has the potential to positively influence joint Service programs is the creation of the Defense Acquisition Board (DAB).

Defense Acquisition Board. Organized in 1986, the DAB replaced the former Defense Systems Acquisition Review Council (DSARC) and the Joint Requirements and Management Review (JRMB) processes. The DAB is the senior DOD

acquisition review board and is chaired by the USD(A). An important change from previous review boards is that the Vice Chairman of the JCS (VCJCS) also serves as the Vice Chairman of the DAB. The VCJCS inclusion on the DAB provides the indispensable "...link between strategy, plans, and doctrine and the requirements and systems they shape".³³ Also significant, the VCJCS is the only permanent member of the DAB who is not a civilian.

The DAB comprises the "corporate vice presidents" on acquisition program issues. It holds formal reviews at all Milestones for approximately 100 major weapon system programs, it assesses Service execution of the previous phase, and recommends to the SECDEF a "go/no-go" decision to proceed to the next phase of development or production.

Of pivotal importance to the selection of joint Service programs, the DAB performs OSD's supraservice oversight role by providing early direction during the requirements process and early development phases. The DAB assesses possible program tradeoffs among cost, schedule, performance, and logistics support and addresses issues such as: affordability; cost growth, control and effectiveness; threshold breaches; joint Service squabbles; acquisition strategy; production rates; test results; inventory objectives; and interoperability.³⁴

Chairman of the JCS. In the DOD Reorganization Act, Congress designated the Chairman of the Joint Chiefs of Staff

(CJCS) as the principal military advisor to the President, the National Security Council, and the Secretary of Defense. In this capacity, the Congress empowered the Chairman to (among other things): prepare fiscally constrained strategic plans, review Service budget proposals to ensure they conform with the priorities and the requirements of the CINCs, to submit alternative budget proposals to achieve a better match between the strategic plans and the requirements of the CINCs, and assess the military requirements for acquisition programs. Congress hopes these new responsibilities and functions will offset the "undue Service influence" and "predominance of Service perspectives in DOD (acquisition) decision making".³⁵

Vice Chairman of the JCS. As discussed earlier, the inclusion of the VCJCS as the Vice Chairman of the DAB provides a "joint" perspective as well as the crucial supraservice link between the CINCs' operational needs and the acquisition process. Additionally, the VCJCS serves as the Chairman of the Joint Requirements Oversight Council (JROC).

Joint Requirements Oversight Council. The JROC consists of the Service Vice Chiefs of Staff¹ and is chaired by the VCJCS. With regard to the joint program selection process, the JROC: examines potential joint military requirements; identifies, evaluates, and selects candidates for joint Service acquisition; provides oversight of cross-

¹Includes the Assistant Commandant of the Marine Corps.

Service requirements and management issues; resolves cross-Service requirements and management issues; and resolves functional, operational, and interoperability issues that arise during joint Service development. The JROC is supported by J-7, the Operational Plans and Interoperability Directorate, for interoperability requirements coordination and joint program development oversight.³⁶

Assessment. The reforms listed above indicate that OSD and JCS recognize the shortcomings of the previous ad hoc approach to joint Service program selection and are seriously attempting to improve the process. Of the four root causes for problems in the selection process (TABLE 3.1), two have been directly addressed and one partially addressed by these OSD and JCS initiatives.

TABLE II. STATUS OF SELECTION FLAWS

-
- No formal OSD policy.....CORRECTED
 - No joint requirements process...PARTIALLY CORRECTED
 - No formal selection criteria.....NOT ADDRESSED
 - No supraservice 'umpire'.....CORRECTED
-

OSD has provided some formal policy guidance on joint Service programs. DOD Directive 5000.1, the policy directive

for major defense acquisition programs, includes specific guidance regarding joint programs...

"Consideration of Potential Common-Use Solutions. To foster commonality and to avoid redundant efforts, all major defense acquisition programs for potential common-use items must consider potential common alternative solutions as early as the concept exploration/definition phase."J

Additionally, DOD Instruction 5000.2, which provides defense acquisition program procedures and details on documentation, provides the following representative statement regarding Milestone requirements...

"Milestone I and II - Common-Use Alternatives Statement. During DAB review of Service-unique programs, the SAE [Service Acquisition Executive] must provide to the DAE [Defense Acquisition Executive] a statement and supporting analysis regarding the feasibility of common-use alternative systems. This information, along with an independent assessment of the SAE's statement and supporting analysis by the OJCS, shall be considered by the DAE when making a recommendation to the Secretary of Defense."J

Additionally, The DAB and the JROC provide effective supraservice organizations to resolve joint Service program conflicts. These organizations provide a cohesive and comprehensive management overview of joint Service programs as they focus on the capabilities needed and the tradeoffs that must be made to achieve those capabilities. Together, the DAB and JROC provide much needed acquisition guidance for joint Service program selection and provide appropriate supraservice oversight.

With regard to the establishment of a joint requirements process, the top-level organizational infrastructure has been

established; however, the jury is still out on whether or not the process is effective in identifying programs with joint potential. For example, in September 1986 the JROC issued a Memorandum for Record regarding the policy and procedures for joint potential review and designation of programs and requirements. In essence, the Services were responsible for annually providing the JROC "a comprehensive list of programs and requirements reviewed" with a "joint potential designator assigned to each program/requirement".³⁹

The Services have responded with varying degrees of enthusiasm as indicated by the significant variance in the quality of their inputs and analysis. The end result being that the JROC has not published a Joint Potential Designation List since the program was initiated in 1986; therefore, no joint programs have been evaluated or merged by this process.⁴⁰ It is for this reason that the joint requirements process is rated as a "partial" success.

It may be that the inconsistency of the Services' inputs reflects the immaturity of the new process, and that as the Services become more familiar with it, their inputs will improve and the process will become productive. However, it could also be that since no formal selection criteria for joint Service programs exists, the Services have different perceptions of what factors give a program "joint potential".

Whatever the reason, this highlights one of the fundamental problems facing the joint program selection. The

JROC depends on the Services to nominate joint program candidates; however, the Services' requirements processes are not designed to accomplish that end. Historically, the Services have tended to operate as separate entities, planning for and acquiring the equipment needs of their individual Services independently. Each Service has its own unique requirements process.¹ "These processes are largely single Service-oriented and are not structured or motivated to identify joint program opportunities...in fact, the requirements processes have produced few, if any, joint program suggestions."⁴¹ As discussed earlier, even after the establishment of the JROC, the Services' inputs have varied significantly and no Joint Program Designator List has been published.

In sum, the absence of any formal selection criteria and the lack of a standard requirements process among the Services are two fundamental flaws with the current selection process.

Candidates For Improvement. The importance of selecting the "right" programs, the systems with the greatest potential for a successful joint Service merger, cannot be over-emphasized. Toward that end, the acquisition policy and

¹ The Services' requirements processes/documentation differ in terms of format, content, timing, coordination procedures, level of approval, and use.

supraservice organizational reforms that have been made regarding the joint Service selection process are nothing short of monumental. The following suggestions for improvement should not diminish in any way those accomplishments, but are offered to further improve the process. The suggested improvements are to establish formal criteria for selection of joint Service programs and to standardize the Services' requirements processes and documentation.

Establish Criteria. The first fundamental flaw with the current joint program selection process is the absence of formal selection criteria. Establishing formal selection criteria would not, as a former DOD executive suggested, provide a "cookbook approach" to joint program selection.⁴² Rather, it would provide a common, logical, and prioritized set of criteria by which organizations with differing perspectives could analyze the complexities surrounding candidate joint programs. Without a common understanding among all the "players" (Congress, OSD, JCS, and the Services) of what characteristics constitute "joint potential" and which programs possess the prerequisites for successful merger, the joint Service selection process will remain fundamentally flawed.

This was essentially what happened in the joint programs discussed earlier (page 22). While pursuing the objectives of cost savings or commonality, OSD, Congress, and the Services

sometimes merged programs without giving adequate consideration to the prerequisite criteria for achieving those objectives--criteria such as common missions, compatible doctrines, similar requirements, etc..

One of the hard-learned lessons to remember is that "cost savings" and "commonality" are not all-encompassing virtues. If a joint program ultimately fails to satisfy the users' mission requirements, it cannot be deemed a "success" regardless of the money saved. Likewise, commonality should not unduly override operational performance. Commonality sometimes offers the illusion of economy, but in reality can force compromises and trade-offs that severely limit the effectiveness of the system and its usefulness to the Services employing it. Commonality (for commonality sake) should not seek the lowest common denominator of mediocrity.

There is, therefore, a hierarchy or sequence to the selection criteria. An acceptable level of compromise on mission-related criteria (mission, doctrine, performance, etc.) must be established first, before the cost saving and commonality objectives can realistically be pursued. Failure to reach acceptable compromise on mission-related criteria is the leading cause for joint program schedule and funding turbulence.⁴³ It may be vogue to state that, "...cost, schedule, performance, supportability, commonality, etc., will be given equal consideration", but in reality, some criteria are (and should be) "more equal" than others.

Establishing formal criteria, a paradigm, for selection of joint Service programs will provide a common understanding of what the prerequisite criteria for merger are, and their relative priority. Merging programs which substantially meet those criteria will, in turn, significantly improve the success rate for joint Service programs.

In addition to improving the success rate, establishing selection criteria should improve the efficiency of the selection process. For example, a common understanding of the criteria among the Services should improve the quality of coordination on Statements of Need (SONs) and Requirements documents. It should improve the quality of the Services' inputs to the JROC's Joint Potential Designator List (JPDL). Moreover, a common understanding of the criteria should help build confidence in the Common-Use Certification, whether the certification is "for" or "against" jointness. Finally, to the extent that Congress understands and agrees with the criteria and how they are applied, Congressional acceptance of DOD's management of joint programs should increase and micromanagement decrease.

Appendix II provides recommended selection criteria for joint Service programs. It attempts to prioritize the criteria relative to their importance in the selection process. Some criteria, such as requirements similarity, are pivotal in determining whether the merger of two systems is "possible". Once a joint program is determined to be

possible, other criteria determine its feasibility and acceptability. Additionally, the selection paradigm attempts to use criteria which can be supported by documents currently required by DOD Instruction 5000.2 for Milestone decisions. The default position for a "system" which has "low joint potential" is to consider jointness at the subsystem, component, technology, and related program level.

Standardize Service's Requirements Processes. The lack of a standard requirements process with standard documentation among the Services is another fundamental flaw with the current joint program selection process. While joint program policy is established by DOD, requirements are established and programs are executed by the Services. Each Service has a unique requirements process sufficient to meet its own needs. However, as was shown earlier, these individual processes have not been effective in identifying or harmonizing the needs of more than one Service.

Standardizing the requirements processes of the different Services would not be a matter of placing broad value judgements on which Service's methods are best. Each Service can point to particular requirements practices with pride. However, none can claim that it has introduced exceptional wisdom in all that it does. In general, the Service-unique requirements approaches have not originated from necessity; rather, most procedures and documentation have evolved in

response to the dynamic needs of the independent Service bureaucracies.

These dissimilarities in the Services' requirements practices and documentation make the joint program selection process unnecessarily complicated and inefficient. To become more efficient and productive, the different Services' requirements practices should be standardized when the differences are not essential to the Service needs and impede the identification, harmonization, or coordination of joint Service candidate programs. Differences in requirements terminology; documentation format and content; and coordination procedures, timing, and level of approval are examples where standardization would remove institutional barriers to a more efficient process.

From a joint program perspective, combining some of the "best" attributes of the existing Service-unique processes into a standard DOD requirements process could minimize the confusion and conflict caused by selecting one Service's process as a prototype or creating an entirely new system. For example, The Navy's Developmental Options Paper (DOP), which is generated in response to a Tentative (draft) Operational Requirement, examines a range of alternatives (to include other Services' requirements) and cost trade-offs to satisfy an operational need. The DOP, or something similar, would be an excellent means to encourage cross-Service

coordination and to minimize parochial, single Service requirements solutions.

The Air Force's Requirements Correlation Matrix (RCM), which documents, tracks, and prioritizes a system's requirements, is another excellent tool that should be considered for any standard requirements documentation. The RCM distinguishes between "must have" and "nice to have" requirements, "need now" and "need later" requirements, and threshold and goal values for the requirements. Additionally, the RCM tracks the requirements and the rationale for any requirements changes from program initiation through procurement. This process helps prevent against "gold-plating" of initial requirements, uncontrolled expansion of requirements ("requirements creep"), and/or dilution of the requirements through the acquisition life cycle. This, in turn, reduces requirements turbulence which helps stabilize the program cost and schedule.

If implemented by all Services, the RCMs of joint program candidates could be used by the Services and the JROC to coordinate and harmonize the various program requirements. Furthermore, once merged, the requirements in the joint program RCM would provide a coherent basis for requests for proposals (RFPs), contract specifications, program baselines, test and evaluation criteria, and Milestone decision "exit criteria".

In sum, there are two fundamental flaws with the current joint program selection process: no formal selection criteria and no standard requirements process. Establishing new policy and new supraservice organizations, by themselves, will not solve the problems with the joint Service selection process. The Services must acknowledge that joint programs are significantly different from single Service programs and that they present a new set of acquisition challenges. These challenges make it imperative that the Services become more active in the identification, coordination, harmonization, and selection of joint Service programs. Toward that end, this research recommends that formal joint Service selection criteria be established and that the requirements processes and documentation be standardized among the Services.

CHAPTER IV

JOINT PROGRAM INITIATION: AD HOC APPROACH

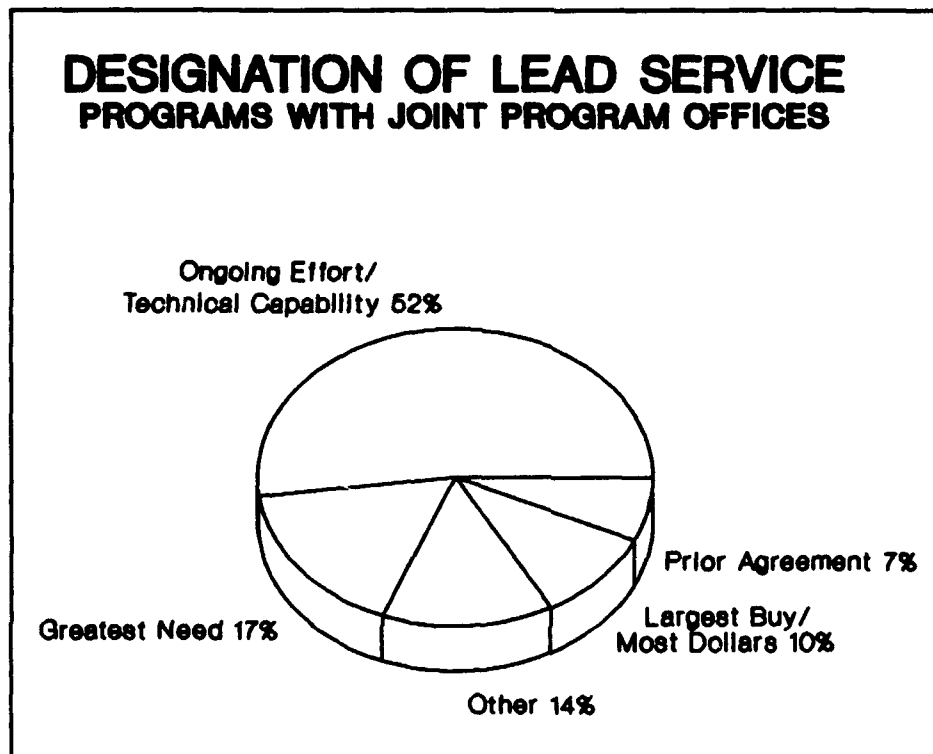
Why Its Been Problematic. Once a program is selected to become joint, the joint program initiation process begins. This process involves designating the executive (lead) Service, establishing a management organization, staffing the management organization, creating the all-important program charter and securing participating Service commitment. These are critical steps to getting a joint program started. If they are not done properly, the lead Service program manager has no effective basis on which to deal with the participating Services. The literature suggests that this important initiation phase has historically been accomplished in a very ad hoc manner. "...[P]roblems can be traced to the...ad hoc environment [used] to select joint programs, select the lead Service, and organize a management structure."⁴⁴

As with the selection process, the lack of policy guidance was the root cause for the Services' ad hoc and imprecise approach to the initiation of joint Service programs. This lack of guidance was compounded by Services' inability to agree on a program charter. Without a jointly-approved charter, issues critical to the successful management of the program, such as the objectives of the program, the scope of the program director's authority, and the responsibilities of key program participants, went unresolved. Failure to agree

on the scope of the program director's authority and the responsibilities of the joint program participants ultimately called into question each Service's commitment to the program.

No Effective Policy Guidance. The major source of problems with the initiation of joint programs stems from the lack of effective policy guidance. Very little policy guidance exists; that which does exist is not consistently followed. No policy exists, for example, that establishes the criteria for selection of the executive, or "lead", Service in a joint program. The different criteria that have been used are illustrated in FIGURE 7.⁴⁵

FIGURE 7 CRITERIA FOR LEAD SERVICE SELECTION



The importance of being selected lead Service can not be over-emphasized, since the lead Service's acquisition rules, regulations, and procedures are used to manage the program. Moreover, "...the interests of the lead Service will dominate the program."⁴⁶

Likewise, there is no effective policy for selecting the type of organization to manage the joint program. Though not explicit about program structure, the Joint Logistics Commanders' Memorandum of Agreement on "Management of Multi-Service Programs/Projects" assumes [emphasis added] the creation of a jointly staffed program office...." However, despite the JLC Study's confirmation that major joint programs tend to be high priority, technically complex, and require more coordination, only 73 percent of the joint programs had established joint program offices (JPOs). Of the 27 percent that were not JPOs, 67 percent felt they did not have the appropriate organization to effectively manage their programs. This is significant because the JLC Study also showed a high correlation between the appropriateness of the management structure and the success of major joint programs.

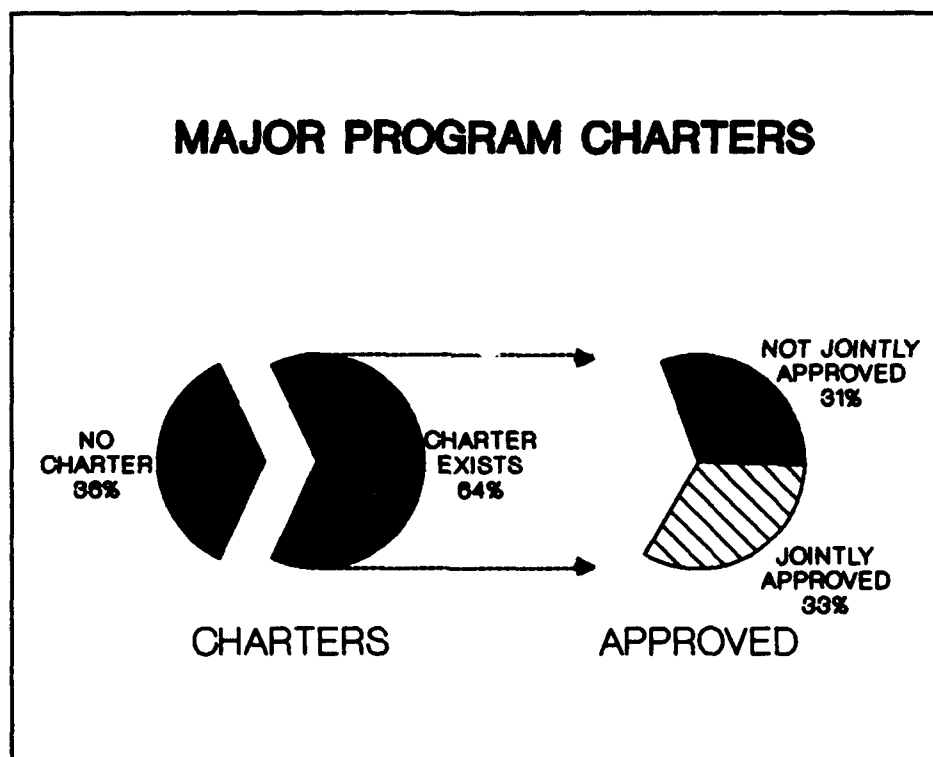
The lack of effective policy guidance for the initiation phase, once again reflects a lack of appreciation for the complexities associated with joint program acquisition and the corresponding need for different management approaches to accommodate them. Accordingly, lead Services were selected by ad hoc procedures based on various rationale, and some

management organizations established along the lines of a single Service program were inappropriate/inadequate to handle the unique demands of jointness. This ad hoc and imprecise approach to the initiation process has contributed to serious schedule and funding turbulence during the execution of programs.

No Jointly-Approved Program Charter. The program charter is the one document that is perhaps the most crucial to the successful initiation of a joint program. The charter, when coordinated and approved at the appropriate levels, should clearly define all aspects of the program director's authority, describe the means for conflict resolution, and define the program objectives, resources, and responsibilities of the participating Services. The program director cannot "assume" authority over another Service's area of responsibility; it must be mutually agreed-to and documented. Furthermore, in a joint program there are many issues whose resolution appropriately lies somewhere between the program director's level and the JROC level. However, if there is no established forum for resolving program conflicts (e.g. requirements and funding), they will not get resolved in a timely and efficient manner. Finally, it is fundamental to sound management practices to have all the participating Services understand and agree on the program objectives and their respective responsibilities in terms of resources and program management.

Despite the charter's importance to the initiation process and to the overall success of a program, the JLC found that only two-thirds (64 percent) of the major joint programs had charters, and only half of these (52 percent) were jointly-approved. Thus, only one-third of the major joint programs had a jointly-approved charter (FIGURE 8).⁴⁷

FIGURE 8 JOINTLY-APPROVED PROGRAM CHARTERS



Of the factors which contributed most significantly to the initial success of joint programs in the JLC study (appropriate program director authority, adequate and timely funding from participating Services, adequate participating Service staffing of the program office, and program conflict

resolution/harmonization), all are directly related to the establishment of a comprehensive and detailed program charter. Conversely, without a jointly-approved program charter, the program director lacks the means to effectively manage the joint program. "In general, joint programs are not organized, staffed, or chartered to effectively manage the unique challenges inherent in jointness."⁴⁸

Lack of Service Commitment. The lack of Service commitment to a joint effort usually manifests itself in the form of unilateral change to the program requirements, resources, and/or schedule, and is often the culmination of inadequate attention to the prerequisites for success in the selection and initiation processes. If, as often happened in the past, a joint program was the result of a "forced marriage" with little or no regard for harmonizing the Services' mission requirements and priorities, then the Services' commitment to the joint program was fragile at best from the start. This fragile commitment would deteriorate further if a program charter had not been approved which established each Service's commitment (responsibilities) for program execution.

Successful harmonization of the participating Services' mission requirements is essential if they are to remain committed to the program. In the past, many joint programs were selected for their cost savings or interoperability potential, then long and arduous negotiations were started to

accommodate each Service's mission requirements in the combined system.

"For the opening rounds--negotiations ordinarily run from 6 months to 2 years--long lists of requirements are presented by each side. Many are "nice to have" features, bargaining chips perhaps, rather than necessities. Others involve environmental factors or critical integration with existing systems."⁴⁹

"Some requirements may be omitted, held in reserve, or will evolve later on. Others, however, are so irreconcilable that they may be dropped from the discussion [negotiations], to surface later and set back acquisition plans and interservice agreement."⁵⁰

These untimely and inefficient negotiations resulted in requirements turbulence. This turbulence was the antithesis of the requirements harmonization (stability) that was necessary for the successful initiation of a joint program. The JLC Study, for example, showed a strong correlation between increased requirements turbulence and increased funding turbulence. The importance of this finding was that both of these problems are associated, in turn, with program cost and schedule growth.⁵¹ A Service which was a reluctant participant to begin with, often had its commitment to the program strained to the breaking point when the program experienced early cost and schedule growth.

As a result of trade-offs during the requirements negotiations and perhaps due to the relative bargaining strength of the Services, one Service was likely to get more than it wanted, the other Service less than it wanted, with both often dissatisfied with the outcome. The Service that

got more than it wanted had its commitment to the program tested as it tried to accommodate other Services' requirements that either exceeded its own needs, exceeded its budget, or were inconsistent with its priorities. On-the-other-hand, the Service that got less than it wanted had to continually weigh its commitment to the joint program against the possibility that its mission requirements would not be satisfactorily met.

More-often-than-not, the inability of the Services to satisfactorily harmonize their requirements, budgets, and priorities led to the deterioration of their commitment to the program. Deteriorating commitment normally manifested itself in the participants failing to adequately staff the joint program office, withholding their share of the program funding, and/or partial or total withdrawal from the joint program. Failure of the participants to provide the necessary manpower and funding resources left the program director without the means to effectively manage the program and only exacerbated the program's cost and schedule woes.

Service withdrawal, whether partial or total, was equally damaging. Many "forced marriages" resulted in one Service significantly reducing its procurement quantity or dropping out of the program altogether. Partial withdrawal left the other participants with higher, small-lot production costs; total withdrawal left the withdrawing Service's unique requirements unpaid for. Despite the fact that withdrawal defeated the original purpose of the joint venture and made

the cost savings and interoperability goals unachievable, there were no penalties for a Service unilaterally withdrawing from a joint program.

A Reformed Initiation Process. As with the reforms in the selection process, the Packard Commission's Report, A Quest for Excellence, played a significant role in the reforms of the joint program initiation process. Additionally, many of the reforms that have taken place in the initiation process stem from the establishment of the JROC and its role as a supraservice arbitrator of interservice requirements and funding disagreements. The following paragraphs will highlight the significant changes that have taken place in an attempt to reform the joint program initiation process.

JROC Initiated Reforms. The establishment of the JROC to "identify, evaluate, and select candidates for joint development and acquisition programs" and to "resolve cross-Service requirements and management issues" has been a major step towards correcting the deficiencies of the initiation process. Specifically, the JROC may address issues... "relevant to the distribution of Service responsibilities for joint program execution and provide recommendations, as appropriate to the USD(A) and the Secretaries of the appropriate Military Department"⁵² This means that when the JROC selects and forwards candidates for joint programs to USD(A), it can also forward recommendations regarding lead

Service, management organization, and joint program responsibilities. Organizationally, the JROC can serve as a supraservice arbitrator in inter-Service disputes and as an enforcer of acquisition policy. Although not part of its charter, the JROC has even played a role in establishing joint program acquisition policy.

The JROC used its supraservice status to endorse a joint Service position on joint program funding. Although promulgated as a JROC Memorandum for Record (MFR), it had the effect of "establishing" acquisition policy for joint programs. The scope of the MFR is broader than just funding and addresses many of the problems that have plagued the joint program initiation process. The following are excerpts from that MFR:

"The following joint Service position is endorsed by the JROC and is the preferred [emphasis added] funding arrangement for joint programs.

- The lead Service, particularly on major programs, should have total program funding authority and responsibility. Funding arrangements should be agreed to as early in the acquisition process as possible.
- Each participating Service should fund its own:
 - Service unique integration efforts
 - Service unique improvements/changes
 - Service procurement
- Programs falling under this concept must have [emphasis added]:
 - a firm statement of requirements
 - a commitment to funding (R&D and procurement)
 - a detailed MOA/MOU covering funding, management, technical baselines.

While we consider it desirable to apply this funding approach to as many joint programs as

possible, there are cases where it is inappropriate. We are confident that the Services, working together, will achieve the appropriate balance in R&D funding."53

It is clear from this MFR that the JROC recognizes the fundamental problems associated with the initiation of joint programs--requirements/funding turbulence and lack of Service commitment (MOA/MOU and/or charter)--and has used the influence of its supraservice position to "establish" acquisition policy.

Baselining of Major Systems. In response to the Packard Commission's recommendation to improve acquisition program stability, DOD Instruction 5000.2 and DOD Directive 5000.45 establish the policy and procedures for baselining acquisition programs. A program baseline is a formal agreement between the Program Director, the Program Executive Officer (PEO), the Service Acquisition Executive (SAE), and the Defense Acquisition Executive (DAE) that briefly summarizes the program's functional specifications, cost, schedule, and other factors critical to the program's success. The program baseline is submitted as part of the Milestone I, II, and III approval process and cannot be changed without DAE approval. Requiring a baseline to be submitted for Milestone decisions should facilitate early harmonization of the Services mission requirements, need dates, funding, and priorities. Additionally, baselines should establish a

commitment within the acquisition community to manage the program within the mutually agreed-to parameters.

Assessment. The reforms outlined above indicate that OSD and JCS recognize the fundamental problems associated with the previous joint program initiation process and are seriously attempting to make improvements. Of the three root causes for problems in the initiation process (TABLE III), all three have been partially corrected by the OSD and JCS initiatives.

Table III. STATUS OF INITIATION FLAWS

- No effective policy guidance.....**PARTIALLY CORRECTED**
 - No jointly-approved charter.....**PARTIALLY CORRECTED**
 - No Service commitment.....**PARTIALLY CORRECTED**
-

OSD has provided formal policy guidance on program baselining of major systems in DOD Instruction 5000.2 and DOD Directive 5000.45. Baselines are designed to facilitate early agreement on mission requirements and to provide a stable basis for Service commitment to a program. However, the DOD policy guidance does not address "joint" program baselines. As with other acquisition guidance, there is little or no

distinction made between joint programs and single Service programs as far as DOD policy is concerned.

The details of how to develop and coordinate a joint program baseline are left to the individual Services. Each Service, firmly entrenched in its own unique requirements and acquisition processes, is noticeably silent with regard to "joint" procedures. As was discussed earlier, the Services usually attempt to manage joint programs (requirements, baselines, and acquisition) just like single Service programs, using dissimilar, sometimes incompatible, Service-specific processes and procedures.

One caution regarding baselines is that they are only summary documents. Within a specified number of pages, the baseline must establish a minimum set of essential requirements which are most demanding in terms of performance, cost, schedule, and support criteria. However, these are not the only criteria. Another caution is that baselines are a commitment among the "acquisition community" on what is needed to successfully execute the program. Although the individual Services have provided guidance on coordination with the operational commands, only the acquisition community signs the baseline.¹ One must be careful to ensure that the critical

¹ This is a relatively recent change. In addition to the acquisition community, acquisition program baselines used to be signed by all commands with a vested interest in the program being acquired--those that have to employ it (operational commands) and those that have to support it (logistics commands), to name a few.

performance requirements in the baseline originate from a validated requirements document and have been coordinated with the operational commands of the using Services.¹ One advantage of the program baseline is that it is mandatory for the Milestone I decision. Thus, for programs that are merged early in the development cycle, baselines "encourage" the Services to address some of the difficult issues early in the program before large amounts of money are obligated.

The JROC MFR on joint program funding, with a few changes, would be an outstanding policy statement. However, the wording of the MFR suggests a reluctance on the part of the JROC to "direct" the Services in an area (acquisition) that has traditionally been the individual Service's purview. For example, the JROC "MFR" states that the joint Service position on joint program funding is "endorsed by the JROC" and is the "preferred funding arrangement". This is somewhat less compelling as a policy statement than, for instance, "this Directive provides policy for joint Service program funding and sets forth uniform procedures governing joint Service statements of requirements, funding commitments, and MOA/MOUs". Moreover, the substance of the MFR is referred to

¹ The Joint STARS program baseline and Decision Coordinating Paper (DCP) for the DAB IIB Milestone decision were initially forwarded to the Air Force Secretariat and OSD (respectively) without coordination with the Air Force or Army using commands. The performance parameters in those documents were different than the mission requirements in the validated joint requirements document.

as the joint program funding "concept" rather than "policy".¹ Finally, the JROC's "... confident [confidence] that the Services, working together, will achieve the appropriate balance...." is not supported by past performance. History has shown that "...the word joint does not necessarily mean togetherness. Most programs are the result of forced marriages...."⁵⁴

One reason the JROC may have felt the need to establish joint Service program "policy" is that the Services' attempts to provide their own policy guidance for joint program management has, for the most part, been ineffective. The Joint Logistics Commanders' "Memorandum of Agreement on the Management of Multiservice Systems/Programs/Projects" was signed in 1973.⁵⁵ Its stated purpose was to establish policies for implementing multi-Service programs. However, the JLC's own study in 1984 found that their policies for joint program management were largely ineffective. For example, despite the policy for joint programs to establish a charter, only 33 percent of the major joint programs had a jointly-approved charter. Additionally, nearly a third of the major programs were not managed by a joint program office. Participating Services are still poorly represented on current

¹ One could argue that when the Vice Chiefs of Staff of the Services "recommend" something be done, the subtlety of words is lost and it is, in fact, a "directive". However, one must also remember that they are, in effect, directing themselves. Each member of the JROC has his own Service's program and budget priorities to protect; therefore, the wording is more suggestive than directive in nature.

joint program office staffs. Multi-billion dollar joint programs like Joint STARS, the Advanced Tactical Fighter, and the Advanced Tactical Aircraft have one or two participating Service members on their staffs.⁵⁶ Finally, unilateral Service withdrawals continue to plague joint Service programs with the Air Force's withdrawal from the Advanced Self Protection Jammer (ASPJ) program with the Navy being the latest joint program "casualty".¹

To summarize with regard to policy guidance, the DOD policy on program baselines is a step in the right direction, but does not address the challenges associated with harmonizing the requirements of a joint program. Additionally, the JROC endorsement of the joint program funding "concept" is also a step in the right direction, but falls short of being a "policy" statement. Furthermore, the Services need to update their policies to address the unique and complex challenges associated with managing a major joint Service program and they need to enforce them. Finally, no policy exists which establishes the criteria for selection of lead Service or for selection of the management organization.

With regard to jointly-approved charters, the need is clear and the policy exists. However, the Services have been unwilling or unable to enforce their own policy regarding charters. The problem is getting the Services to relinquish

¹ There are strong rumors that the Navy may be withdrawing from the joint AF/Navy Advanced Medium Range Air to Air Missile (AMRAAM) program as well.

control over their resources and to harmonize their requirements in the interest of jointness.

The JROC may need to exert its supraservice influence as an arbitrator and/or enforcer if joint charters are to be effective. The JROC MFR on joint program funding states that programs falling under the joint program funding concept must have "a detailed MOA/MOU covering funding, management, and technical baselines". This could fill the jointly-approved program charter void. In sum, the problems surrounding jointly-approved program charters are only partially corrected.

With regard to Service commitment, the DOD policy on program baselines is a positive move toward stabilizing the acquisition environment. But, as was pointed out earlier, it is essentially an agreement among the acquisition executives and is a summary document. Moreover, the program baseline is based on the premise that the mission requirements have been prioritized and harmonized among the Services. This is normally not the case; the dissolution of many joint programs can be traced directly to inadequate resolution of requirements issues at the onset of a joint program. A DOD or JROC policy which establishes a "joint requirements baseline" (e.g., joint requirements document) as a precursor to the program baseline would appear to be a more effective means for securing Service commitment. Finally, there are no incentives for a Service to merge its requirements into a joint program

and no disincentives/penalties for unilateral withdrawal. For these reasons the fundamental problem of securing Service commitment is only partially corrected.

Candidates for Improvement. The success or failure of a joint program can hinge on how well the participating Services accomplish the program initiation process. The previous paragraphs have discussed some of the recurring problems associated with initiating joint programs and some of the corrective measures that have been implemented with varying degrees of success. The following paragraphs identify candidates for further improving the initiation process. The candidates for improvement are: to establish effective joint Service acquisition policy which recognizes the unique challenges surrounding joint program initiation, establish mandatory "exit criteria" for proceeding into full scale development, and create incentives for joint program participation as well as penalties for unilateral withdrawal.

Establish Effective Joint Service Policy. The one improvement that would significantly improve the initiation process and joint acquisition in general, is to develop an effective joint Service acquisition policy. It is universally acknowledged that joint programs are significantly more difficult to administer and present unique management challenges.

From the JLC Guide for Management of Joint Programs.
"Aspects of [joint] program management that demand

greater emphasis than single Service acquisition programs are discussed to provide an appreciation of the increased complexities resulting from the intricacies of multi-Service involvement."⁵⁷

From the GAO Study. "In any event, multi-Service programs are extraordinary tasks to carry through in the multifaceted DOD."⁵⁸

From the DSB Study. "Joint Service Program Management offers an exceptional challenge to the Acquisition Manager. Effective joint management not only requires a comprehensive understanding of the needs and requirements of each of the Services involved, but also requires an understanding of the differences in areas such as logistics support, financial management, program management philosophy..."⁵⁹

From the JLC Study. "Joint Program offices are not set up to handle the unique challenges of joint management. In general, joint programs are not organized, staffed, or chartered to deal with joint program issues. Too often joint programs are managed like single Service programs, with little or no recognition of the added complexities that come from working with two or more Services."⁶⁰

Despite the acknowledged differences and complexities, DOD acquisition policy does not distinguish between single and joint Service acquisition. With the exception of the Common-Use Statement, the acquisition policy in DODD 5000.1 and DODI 5000.2 treats all major acquisition programs the same.¹

Moreover, DODD 5000.1 directs the Service Acquisition Executives to...

"manage the established acquisition structure and process within their Component [emphasis added] in a manner that is consistent with, and supportive of the policies and provisions of this Directive and DODI 5000.2."⁶¹

¹ See page 29 for Common-Use discussion.

Therefore, the Services' acquisition policies are largely single Service-oriented and are not structured to accommodate the unique demands associated with joint acquisition of major systems. The Services' attempts at joint program policy have been largely ineffective and unenforceable.¹

The JROC can identify, evaluate, and select candidates for joint development and acquisition, but it is not part of its charter to establish joint Service acquisition policy. Therefore, in an attempt to use its supraservice status to influence the Services' ineffective joint acquisition policy, the JROC has resorted to endorsing Memorandums for Record.

The end result is that joint program initiation is accomplished in a very ad hoc manner. If DOD wants to take advantage of the potential benefits associated with joint programs, and if the Services' want to retain their autonomy with regard to acquisition, then they must establish and enforce an effective joint Service acquisition policy. They need to provide joint program-specific policy guidance for joint program selection, lead Service selection, and management organization selection. They need provide joint program policy that requires joint requirements documents, jointly-approved charters, and joint funding approaches. Establishing joint program policy is only part of the problem; to be effective, they must be able to enforce it.

¹ See the discussion on the JLCs' MOA on page 53.

Establish "Exit Criteria". There are certain "minimum standards of stability" that have to be established before any management and/or economic principles can hope to be effective. If the Services cannot reach a common understanding/agreement on the essential mission requirements, or if the funding responsibilities are unresolved, then it is unlikely that a joint program will succeed. Likewise, if the program management structure and staffing is inadequate, then the program director will not have the means to effectively handle the challenges associated with joint Service programs.

Before a joint program should be initiated, a sufficient basis for Service commitment to the program requirements, funding, and management responsibilities must be formally agreed upon. When these issues are not satisfactorily resolved or are "papered-over", they will plague the program during the execution phase. At that time program interruptions cost more money, cause budget and program perturbations, and induce a loss of Congressional and public confidence. Short-cutting the initiation process has proven to be a mistake.

To provide the minimum standards of stability, to provide the basis for Service commitment, and to ultimately improve the initiation process, it is recommended that agreements on requirements, funding, and management responsibilities be made mandatory "exit criteria" for a joint program proceeding into full scale development (Milestone II). In other words, before

a joint program can go before the DAB for approval to enter FSD, it must have a joint requirements document¹, Service commitment to a funding profile, and a jointly-approved program charter.

The joint requirements document should be fully coordinated and validated by the JROC. This joint requirements document will become the basis for the program baseline, the Decision Coordinating Paper (DCP), and the Test and Evaluation Master Plan (TEMP). Each Service must commit to their share of the funding (in accordance with the JROC joint program funding concept MFR) and provide the funding on a profile that meets the joint program needs. Finally, a program charter which clearly establishes the program director's authority, the participating Services' responsibilities, and interservice relationships should be jointly-approved at the Service headquarters level. The advantages of Service headquarter's-level approval are twofold: first, it is the level at which operational requirements are translated into equipment needs; and second, it is the level at which funding priorities are established.

Establish "Carrots and Sticks". The final candidate for improvement of the initiation process centers on securing joint Service commitment to the joint program, or conversely,

¹ See page 35, Standardize Services' Requirements Processes, for remarks regarding joint program requirements documentation.

minimizing the number of unilateral Service withdrawals. The current initiation process provides few, if any, real incentives (carrots) for a Service to participate in a joint program. On the contrary, there are numerous reasons why a Service would not want to participate (e.g., compromise requirements, cost and schedule growth, etc.).

Assuming that the other fundamental flaws previously identified have been corrected, the Services may be encouraged to consider joint programs as a viable alternative to single Service programs, if there were an incentive. One possible way to provide this incentive is to set aside a block of funds for joint Service development efforts. The Services would not contribute funds until the latter stages of development and procurement. Another approach would be for DOD to match development funds contributed by joint program participants at some pre-agreed rate. The premise for these incentives is that the Services will be more willing to commit to a joint venture, if the development is "cost free or discounted".¹

The opposite, but related problem, is how to maintain the Services' commitment once they are engaged in a joint venture. When one Service reduces its funding on a joint program, or is unwilling to fund its share of an cost overrun, major problems accrue to the joint program. Unfortunately, as

¹ One could argue that, from a Service perspective, set-aside funds are still DOD money and, in one way or another, a deduction from their budgets. In other words, the way that DOD would accumulate this pool of development funds would be to "skim" it off the top of the Services' R&D accounts.

the Services adjust their budgets in reaction to changing priorities and budget cuts imposed by external sources, unilateral funding reductions and/or Service withdrawal happens all too frequently.

The prevalence of unilateral Service withdrawals from joint programs can be attributed, in part, to the fact that there are generally no penalties ("sticks") to discourage them. The GAO, among others, has suggested that a Service be penalized for withdrawing from a joint program. One approach would be to take the funds that the withdrawing Service had budgeted and transfer them, less the cost of the Service's unique requirements, to the remaining participants.

Again caveating this recommendation with the assumption that the other fundamental flaws have been corrected, some sort of penalty should be imposed on a Service for unilateral withdrawal from a joint program.⁴

⁴ If the selection process identifies the programs with the prerequisites for success and the initiation process ensures a reasonable level of requirements, funding, and management stability, then a penalty for withdrawal should be warranted. If, however, the joint program is initiated as a "forced marriage", with little regard to the requirements harmonization, then a penalty would seem inappropriate.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Recent world events and contemporary defense issues have produced two seemingly irreconcilable trends. The first trend, a shrinking defense budget, is based on Presidential and Congressional initiatives for a more efficient defense acquisition system, the U.S. public's perception of a reduced Soviet threat, and the fiscal problems associated with the massive federal deficit. The second trend, a stable or increasing defense budget, is based on the U.S.'s need to maintain/modernize its military forces to protect our national interests and to preserve our position as a world military power .

One acquisition strategy with real potential for solving this budget dilemma, while at the same time increasing interoperability and acquisition efficiency, is joint Service programs. The concept of two or more Services avoiding duplicative development, production, and operating costs by acquiring major systems for common use could become an attractive, if not essential, acquisition strategy to be considered for future defense systems.

While joint programs provide the potential for tremendous benefits, historically, these benefits have been elusive for major systems acquisition. Unfortunately, joint Service programs bring to acquisition management an entirely new set

of challenges and problems. This research examined these recurring problems to joint program management in two distinct phases. The first phase, joint program selection, involves the process whereby single Service acquisition programs are considered for establishment as joint Service programs. The second phase, joint program initiation, involves establishment of the program management infrastructure (e.g., establishing a program office, staffing the office, developing a program charter, etc.) and securing participating Service commitment to the joint program.

Conclusions.

Selection Process Conclusions. The major conclusion regarding the selection of joint programs is that, until recently, it was essentially an ad hoc process. Acquisition policy/guidance for joint programs did not exist. There was no formalized requirements process, no standard joint program selection criteria, and no supraservice organization with the sustained "clout" to provide direction and oversight.

Recent reforms have been instituted that partially correct several of these deficiencies. The update of DOD policy directives to include Common-Use certifications for all major program new starts ensures the SAE and JROC review all programs for joint potential. Furthermore, the establishment of USD(A), the DAB, and the JROC provides the organizational infrastructure for supraservice oversight of joint programs.

However, conclusions regarding the joint requirements process are unsettled. While the JROC provides the infrastructure for the Joint Potential Designation List (JPDL) process and is chartered to select candidate programs for joint acquisition, it depends on the Services to nominate joint program candidates. The Services' requirements and acquisition processes, however, are largely single Service-oriented and are not structured or motivated to identify joint program opportunities. No joint programs have been initiated as a result of the JPDL process since its inception in 1986.

Lastly, no joint program selection criteria has been established. Without a common understanding among all the participants of what factors constitute "joint potential" and what programs possess the prerequisites for successful merger, the selection process will remain fundamentally flawed.

Initiation Process Conclusions. The major problem with the initiation process, as with the selection process, was the lack of effective policy guidance. This led to an ad hoc approach to selection of the lead Service, the management organization, and other factors crucial to the success of a joint program. The failure to provide comprehensive and effective policy guidance reflects a lack of appreciation for the complexities associated with joint program management and represents a fundamental flaw in the initiation process.

A second major problem was the unwillingness or the inability of the Services to enforce their own policy on joint

program charters. Despite its importance to the successful initiation of a joint programs, only 33 percent of the programs had a jointly-approved charter. The failure to agree on the participating Services' authority, resource responsibilities, and interservice relationships leads to program instability. Instability, in turn, leads to cost and schedule growth.

Lack of Service commitment to joint programs was the final problem with the initiation process. The DOD policy on program baselining is a step in the right direction, however, it does not adequately address the other challenges associated with joint program initiation (e.g., requirements baselining). Finally, there are no incentives for a Service to merge its requirements into a joint program and no penalties for unilateral Service withdrawal.

Recommendations.

Selection Process Recommendations. The importance of selecting the "right" programs, the systems with the greatest potential for success, cannot be overemphasized. This research recommends two major improvements to the joint program selection process. First, establish formal selection criteria, and second, standardize the Services' requirements processes and documentation.

Establishing a formal selection criteria would provide a common, logical, and prioritized set of criteria by which

organizations with differing perspectives could analyze the complexities surrounding candidate joint programs.⁴ Establishing formal criteria will provide a common understanding of what the prerequisite criteria for merger are, and their relative priority. Merging programs which substantially meet those criteria will, in turn, significantly improve the success rate for joint Service programs. In addition, a formal criteria would improve the cross-Service coordination on requirements documents, the quality of the Services' JPDL nominations, the rationale for Common-Use certification, and the Congressional acceptance of DOD's joint program management.

The second recommendation, standardizing the Services' requirements processes and documentation, would eliminate unnecessary obstacles to the efficient cross-Service coordination and harmonization of requirements. Currently, differences in requirements terminology; documentation content and format; and coordination procedures, timing, and level of approval make the selection process unnecessarily complicated and inefficient.

Initiation Process Recommendations. The ultimate success of a joint program can hinge on how well the participating Services accomplish the initiation process. This research recommends three improvements to that process:

⁴ Recommended selection criteria are provided at Annex II.

establish effective joint Service acquisition policy, establish "exit criteria" for proceeding into full scale development, and create incentives/disincentives to secure Services' commitment to joint programs.

The first recommendation is to establish effective joint program policy guidance. While it is generally acknowledged that joint Service programs are substantially different and more complex than single Service programs, existing policy is largely single Service-oriented. This results in attempts (sometimes futile) to manage a joint program using dissimilar, single Service management approaches. In order to take advantage of the potential benefits of joint programs, joint program-specific policy guidance must be established for joint program selection, lead Service selection, management organization selection, joint requirements documents, joint program charters, and joint program funding.

The second major recommendation is to establish "exit criteria". This research recommends that joint Service agreements on requirements, funding, and management responsibilities be made mandatory "exit criteria" for a joint program to proceed into full scale development (Milestone II). This will provide minimum standards of stability, provide a basis for Service commitment, and ultimately improve the initiation process.

The final recommendation is to create incentives for Services to participate in joint programs, either through DOD

provided funding during early development or through a DOD cost sharing arrangement. Conversely, to help stabilize joint programs once they've been established through a more formal and standard selection process, disincentives (penalties) should be instituted for unilateral Service withdrawals.

APPENDIX I

SUMMARY OF MAJOR JOINT PROGRAM STUDIES

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The General Accounting Office (GAO) Study. The GAO study examined 15 major joint Service acquisition programs. Their definition of a joint program was the most restrictive, requiring:

"... two or more Services getting together, early on, to (1) agree on a joint system's functional requirements--military capabilities and operating features needed, (2) cooperate through development, and (3) procure system versions for themselves that are substantially alike ... full collaboration from early development to deployment."

Their measures of success were substantial commonality, satisfied participating Services, and actual documentable savings. Based on these ground rules, the GAO study concluded that there had been no successful joint programs.

The Defense Science Board (DSB) Study. The DSB study expanded the scope considerably, examining 68 joint DOD/component programs that ranging from major systems to technology base programs. The DSB defined a joint program as:

"Any Defense system or technology program that substantially (formal coordination, direction, and/or funding) involves more than one DOD component during any or all of the four major phases of a system life-cycle in a planned and systematic fashion for the purpose of gaining one or more of the hoped for benefits in performance, cost, readiness, or operations."

The DSB criteria for a successful program was: over 50% commonality; system/components fielded in large numbers; and goals [performance] achieved without major (over two years) schedule slippages. Not surprisingly, using these more

liberal criteria, the DSB determined "...about two-thirds of the programs were "successes" or had good prospects for success."⁶⁴

The Joint Logistics Commanders' (JLC) Study. The JLC study was by far the most comprehensive and quantitative analysis performed on joint programs. The JLC study examined 80 joint Service programs representing the full spectrum of joint program activity (i.e., technology base to major system, and concept exploration through deployment). While never stated, it could be inferred from the broad scope that the JLC definition of a joint program was more liberal and multi-dimensional like the DSB definition. Because of its increased emphasis on quantitative data, the JLC study eliminated several measures of success focused on by other studies. One important measure, the degree of user satisfaction with the end product, for example, was not used as a measure of success in the JLC study because it is a subjective characteristic and cannot be meaningfully measured. The JLC measures of success for a joint program are: "minimal technical requirements compromise, high degree of commonality, low cost growth, low schedule growth, attainment of performance goals, attainment of supportability goals, and high harmony".⁶⁵

APPENDIX II

RECOMMENDED JOINT PROGRAM SELECTION CRITERIA

RECOMMENDED JOINT PROGRAM SELECTION CRITERIA

General. The following is a recommended approach to the selection of joint Service programs. No values are placed on the criteria since their relative importance may vary from program to program. However, the priority sequence of the criteria does place the emphasis on mission accomplishment over cost savings or commonality. This approach represents a logical sequencing of criteria to determine whether a joint program is "possible", "feasible", and "acceptable". As one proceeds through the paradigm, a decision against jointness at the "system level" does not rule out the possibility for jointness at the subsystem, component, or related system levels. In fact, that should always be the default path.

These criteria should be helpful to the Services in evaluating candidates for the JPDL, the SAE's in developing their Common-Use Certifications, and the JROC in evaluating the joint potential of various programs. Whether this recommended approach is utilized or some other criteria is used, it is important that all parties involved in the joint program selection process use the same criteria.

Is a Joint Program POSSIBLE?. The premise for a joint program is that there is sufficient commonality in the mission requirements of two or more Services that one system, or variants of one system, could satisfy them all. Therefore, the first set of criteria that should be examined relates to the commonality of the mission-related requirements.

MISSION NEED. The first criterion is mission need. If the mission is clearly unique to one Service, then the prospects for jointness at the "system" level are low and one should consider the default path to determine joint potential. If, however, the mission is a shared mission (e.g., close air support) or the mission is similar/complimentary to another Service's mission, then one system, or a variant of one system, may support both Services' needs.

THREAT. If the missions are common, do they operate against the same threat? If the threats are the same or similar, then a joint program is still possible. If the threats are different, then they may drive different system requirements that are not compatible in a single system. For example, the Air Force and Navy versions of the ATF will both be air superiority fighters; however, the threat and operating environments are different. Therefore, while stealth may be a critical threat-driven requirement for the Air Force, the Navy may not place a premium on that design requirement.

OPERATIONAL CONCEPT/ENVIRONMENT. Next, the operational concept/environment should be examined to determine if it drives any system requirements that may make commonality a problem. For example, an aircraft that operates off a carrier or from austere landing strips may drive system requirements that are dramatically different from an aircraft with the same CAS mission, but that operates from a main operating base.

Differences in command and control, basing, support/logistics should be examined for commonality and/or dissimilarities. Different theaters of operation can also demand different requirements. If this criterion precludes a joint program at the system level, the default path should be explored to determine if joint development of subsystems and components may be productive (e.g., engines, avionics, mission planning systems, etc.).

DOCTRINE. Service doctrine may also drive system requirements. One should examine whether the proposed system and concept of operations is compatible with its Service's doctrine. Keeping an open mind is essential when evaluating this criterion. A possible merger should not be rejected based solely on incompatibility with doctrine without first asking if the mission might be better served by changing the doctrine. Advances in technology can change concepts of operation and doctrine.

REQUIREMENTS. This criterion is the "acid test" for whether a joint system is possible. A high degree of commonality among the requirements means that a joint program is possible without compromising the mission. However, the previous four criteria may have generated mission-related system requirements (speed, range, altitude, reliability, capacity, supportability, etc) for the Services' missions that are physically incompatible in the same system.

If not compatible, then the specific mission requirements that cannot be accommodated should be clearly identified and the default path should be explored. If the requirements are compatible, all assumptions, constraints, and risks should be clearly stated along with the list of common requirements before moving to the feasibility criteria.

This is clearly is an oversimplified portrayal of the requirements coordination/negotiation process. In reality, the Services may have differing views on what is mission essential and what isn't. The JROC may need to intervene as the supraservice arbitrator to resolve some of the requirements issues. However, mission-related requirements should be the sole basis for determining whether a joint system is possible.

Is a Joint Program FEASIBLE? Having passed the first set of criteria means that there is a common understanding of the mission essential requirements and there is a mutual agreement that these requirements can be realistically accommodated in a single system or variant. The feasibility criteria assess whether there is any practical advantage to merging the systems. Joint programs are very complex to organize and to manage. Unless there are compelling operational and/or economic rationale supporting a joint venture, single Service acquisition would be advised.

SCHEDULE. The first feasibility criterion is schedule. One should first determine whether the schedule for the proposed system is reasonable and whether it is compatible with the stage of development and the need date of the other Service. Based on the maturity and/or the complexity of the technology involved, assess the schedule risk and each Service's sensitivity to possible schedule slips. If the Services' systems are in vastly different stages of development, it will be difficult, costly, and risky to merge the programs. It would also be worthwhile to examine the schedules of related programs within the mission area to determine the pacing systems. A reasonable amount of schedule stretch-out or compression may be warranted in the interest of jointness if related systems schedules justify it.

COST. Cost savings is the reason most often given for merging two Services into a joint program. However, as was shown earlier, these predicted cost savings were based more on intuition than on analysis. As difficult as it is, a cost analysis must be done if projected cost savings are a major factor in the decision. The economic assumptions, acquisition strategy, schedules, production quantities, and production rates must be clearly stated. As a minimum, the cost analysis should compare the development, production, and operations and support costs as well as life cycle costs for the single Service and the joint alternative.

OPERATIONAL BENEFIT. In addition to cost savings, the potential operational benefits need to be examined. Commonality and increased interoperability are usually the measures of merit for this criterion. However, as discussed in the report, not all commonality is good. Commonality is good when it eliminates unnecessary duplication in systems, or increases interoperability among the Services. However, common systems may have common vulnerabilities. One needs to evaluate whether embarking on a joint program creates a single point failure across a family of weapon systems (e.g., electronic countermeasure suites). Moreover, commonality that seeks the lowest common denominator of mediocrity, may ultimately sacrifice mission accomplishment.

If the feasibility criteria indicates that there is little or no schedule, cost, or operational benefit to merging the programs at the system level, then examine the default path. However, if the analysis clearly indicate benefits in these areas, then proceed to the acceptability criteria.

Is a Joint Program ACCEPTABLE? By now the analysis has indicated that common mission requirements provide the essential prerequisite for selecting a program for joint acquisition. Furthermore, the feasibility criteria have indicated that the schedules are compatible and that there is compelling economic and/or operational benefit to merging. The last step is to determine whether the merger will be acceptable to all parties involved.

LEVEL OF COMPROMISE. The level of compromise required by each Service to reach agreement on the common mission requirements must be equitable. If one Service believes that requirements compromises have jeopardized its mission, the joint program will not be accepted.

PRIORITY. If the proposed joint program attempts to merge widely divergent Service priorities, the program may not be acceptable to the Service that has the lower priority. Alternatively, the Service may accept the merger only to unilaterally withdraw when budget pressures force it to divert funds to higher priority programs.

COST. The total program cost must be acceptable (i.e., affordable). Likewise, each Service must be able to accept its share of the program cost and provide it on the schedule required.

SCHEDULE. The development, production and delivery schedules must be coordinated and agreeable to all parties. The schedules that met the feasibility criteria and produced cost savings may not be supportable by all the participants.

SERVICE COMMITMENT. For a joint program to be acceptable, all of the participants must remain committed to the joint requirements, the cost and schedule goals, and to their responsibilities for funding, staffing, and executing the program.

EXTERNAL PRESSURES/COMMITMENT. External pressures play an important role in the ultimate success of a joint program. Congress controls the appropriations for defense programs, therefore, early and sustained Congressional support for any joint effort is essential to its success. While Congress has been the instigator of many joint programs and is pressing DOD for more joint programs, that does not mean that they support all joint programs with equal vigor simply because they are joint programs.

INCENTIVES/PENALTIES. Currently, there are no incentives for joint program participation and no penalties for unilateral withdrawal. However, if these were to be instituted, then the participants would need to accept them as a part of their commitment to the joint program.

Summary. The preceding selection criteria provide a prioritized framework for the evaluation and selection of joint programs. Joint program possibilities should be based on the commonality of the mission requirements, not on potential economic and operational benefits, and not on what is preferred by the Services. The feasibility of a joint program must be based on analysis, not on intuition. While there are many impediments to overcome in conducting joint programs, the reality is that single Service programs cannot be afforded for every possible use. These selection criteria are recommended to improve the joint program selection

process. Services need to take a more active role in the identification, coordination, and selection of joint programs.

NOTES

Chapter I

1. "Goldwater-Nichols Department of Defense Reorganization Act", U.S. Code, Congressional and Administrative News, Public Law 99-414 to 99-462, 99th Congress, 2nd Sess. (West Publishing Co.), No. 9, Nov 1986, p.2174.
2. A Quest for Excellence, Final Report to the President, The President's Blue Ribbon Commission on Defense Management (Washington: 1986), p.4.
3. U.S. General Accounting Office, Joint Major System Acquisition by the Military Services: An Elusive Strategy, Report to the Congress (Washington: 1983), p. ii.
4. Ibid., p. 28.
5. Department of Defense, Major and Non-Major Defense Acquisition Programs, DOD Directive 5000.1 (Washington: 1987), p. 2.

Chapter II

6. Robert P. Bongiovi, The Role of the OJCS in Weapon System Acquisition (Washington: The Industrial College of the Armed Forces, 1986), p.4.
7. Goldwater-Nichols, p. 2177.
8. Bongiovi, p. 4.
9. Dick Cheney, Defense Management Report to the President, (Washington: 1989), p.1.
10. Figure 1 is adapted from the Annual Report to the President and to the Congress, prepared by the Secretary of Defense, (Washington: 1990), pp. 11 and 71.
11. Frank C. Carlucci, Annual Report to the Congress, Fiscal Year 1990, (Washington: 1989), p. 5.
12. Figure 2 is adapted from the Joint Program Study, Final Report, Volume II, prepared by the Joint Service Acquisition Program Management Study Ad Hoc Group, (Washington: 1984), p. H-3.

13. Figure 3 is adapted from the Joint Program Study, Volume II, p. H-7.

14. Joint Program Study, Volume II, pp. H-9-11.

15. Figure 4 is adapted from the Joint Program Study, Final Report, Volume I, prepared by the Joint Service Acquisition Program Management Study Ad Hoc Group, (Washington: 1984), p. 1-3.

16. U.S. GAO, pp. 1-50.

17. Department of Defense, Joint Service Acquisition Programs, Defense Science Board 1983 Summer Study, (Washington: 1984), pp. 1-39.

18. Joint Service Acquisition Program Management Study Ad Hoc Group, Joint Program Study, Final Report, Volumes I and II, (Washington: 1984).

19. Figure 5 is adapted from the Joint Program Study, Volume I, p. 3-17.

20. U.S. GAO, p. 28.

Chapter III

21. Joint Service Acquisition Programs, Defense Science Board, p. 11.

22. The Joint Logistics Commanders' Guide for the Management of Joint Service Programs, (Washington: The Defense Systems Management College, 1987), 3rd Ed, p.3-1.

23. U.S. GAO, p. 10.

24. Joint Program Study, Volume I, pp. ES-3-4.

25. Ibid., p. 3-11.

26. Figure 6 is adapted from the Joint Program Study, Volume I, p. 3-12.

27. Robert F. Coulam, Illusions of Choice: The F-111 and the Problem of Weapons Acquisition Reform (Princeton University Press, 1977) pp. 252, 333, and 334 f.n..

28. Robert J. Art, The TFX Decision: McNamara and the Military (Boston: Little, Brown and Co., 1968) pp. 18 and 36.

29. U.S. GAO, p. 13.

30. Ibid., p. 17.
31. Ibid., p. 21.
32. David C. Jones, General, U.S. Air Force (Retired), "What's Wrong With Our Defense Establishment," New York Times Magazine (November 7, 1982) pp. 76 and 78.
33. Bongiovi, p. 10.
34. Wilbur D. Jones, Introduction to Defense Acquisition Management (Washington: The Defense Systems Management College, 1989) p. 12.
35. Congressional Record, 12 September 1986, p. 6835.
36. Joint Requirements Oversight Council Memorandum, "New Charter for the Joint Requirements Oversight Council (JROC)," 25 September 1989.
37. DOD Directive 5000.1, p. 4.
38. Department of Defense, Defense Acquisition Program Procedures, DOD Instruction 5000.2 (Washington: 1987) p. 8.
39. JROC Memorandum for Record, "Policy and Procedures for Joint Potential Review and Designation of Programs and Requirements," 4 September 1986, p. 1.
40. Interview with Colonel Robert P. Bongiovi, JCS Directorate of Force Structure, Resources, and Assessment, the Pentagon, Washington, DC: 4 April 1990.
41. Joint Program Study, Volume I, p. 3-8.
42. U.S. GAO, p. 41.
43. Joint Program Study, Volume I, p. 3-26.

Chapter IV

44. Defense Science Board, p. 11.
45. Figure 7 is adapted from the Joint Program Study, Volume II, p. D-48.
46. The Joint Logistics Commanders' Guide, p. 6-2.
47. Figure 8 is adapted from the Joint Program Study, Volume I, p. 4-6.

48. Joint Program Study, Volume I, p. ES-7.
49. N.A. McDaniel and D.A. Lorenzi, An Analysis of Joint Service Programs (Newport, RI: Center for Advanced Research, Naval War College, June 1979) p. 46.
50. U.S. GAO, p. 15.
51. Joint Program Study, Volume I, p. 3-22.
52. Joint Requirements Oversight Council Memorandum, p. 6.
53. JROC Memorandum for Record, "Joint Program Funding", 7 August 1986, p. 1.
54. The Joint Logistics Commanders' Guide, p. 13-1.
55. Ibid., p. A-1.
56. Interview with Colonel Bruce Carlson, Chief of Advanced Program Requirements, Headquarters Tactical Air Command, Langley AFB, VA, 18 April 1990.
57. Ibid., p. 1-1.
58. U.S. GAO, p. 46.
59. The Defense Science Board, p. 31.
60. Joint Program Study, Volume I, p. 6-3.
61. DOD Directive 5000.1, p. 8.
62. U.S. GAO, p. 2.
63. Defense Science Board, p. 9.
64. Ibid., p. 10.
65. Joint Program Study, Volume I, p. 2-16.

BIBLIOGRAPHY

- A Quest for Excellence, Final Report to the President, The President's Blue Ribbon Panel on Defense Management. Washington: 1986.
- Art, Robert J. The TFX Decision: McNamara and the Military. Boston:; Little, Brown and Co., 1968.
- Bauer, Theodore W. Requirements for National Defense. Washington: Industrial College of the Armed Forces, 1970.
- Bongiovi, Robert P. The Role of the OJCS in Weapon System Acquisition. Washington: The Industrial College of the Armed Forces, 1986.
- Carlucci, Frank C. Annual Report to the Congress, Fiscal Year 1990. Washington : 1989.
- Cheney, Dick. Defense Management Report to the President. Washington: 1989.
- Clark, Asa A. IV, et al., eds. The Defense Reform Debate: Issues and Analysis. Baltimore: John Hopkins University Press, 1984.
- Coulam, Robert F. Illusions of Choice: The F-111 and the Problem of Weapons Acquisition Reform. Princeton University Press, 1977.
- Department of Defense. Acquisition Strategy Guide. Fort Belvoir, VA: The Defense Management College, 1984.
- Department of Defense. Baselining of Selected Major Systems. DOD Directive 5000.45. Washington: 1986.
- Department of Defense. Defense Acquisition Program Procedures. DOD Instruction 5000.2. Washington: 1987.
- Department of Defense. Glossary: Defense Acquisition Acronyms and Terms, 4th Ed. Fort Belvoir, VA: The Defense Systems Management College, 1989.
- Department of Defense. Major and Non-Major Defense Acquisition Programs, DOD Directive 5000.1. Washington: 1987.
- Department of Defense. Program Manager's Notebook, "Joint and Multiservice Programs. Fort Belvoir, VA: The Defense Management College, 1988. pp. 8.2a-h.

Fallows, James M. National Defense. New York: Random House, 1981.

"Goldwater-Nichols Department of Defense Reorganization Act."
U.S. Code, Congressional and Administrative News. Public
Law 99414 to 99462, 99th Congress, 2nd Session.
Washington: West Publishing Co., 1986. No. 9.

Interview with Colonel Robert P. Bongiovi, JCS Directorate
for Force Structure, Resources, and Assessment, the
Pentagon, Washington, DC: 4 April 1986.

Joint Logistics Commanders' Guide for the Management of Joint
Service Programs, 3rd Ed. Fort Belvoir, VA: The Defense
Systems Management College, 1987.

Joint Requirements Oversight Council Memorandum, "New Charter
for Joint Requirements Oversight Council (JROC)," 25
September 1989.

Joint Service Acquisition Program Management Study Ad Hoc
Group. Joint Program Study, Final Report, Volumes I and
II. Washington: 1984.

Jones, David C. "What's Wrong With Our Defense
Establishment?" New York Times Magazine, November 1982.

Jones, Wilbur D., Jr. Introduction to Defense Acquisition.
Fort Belvoir, VA: The Defense Systems Management
College, 1989.

JROC Memorandum for Record, "Joint Program Funding", 7 August
1986.

JROC Memorandum for Record, "Policy and Procedures for Joint
Potential Review and Designation of Programs and
Requirements", 4 September 1986.

Luttwak, Edward N. The Pentagon and the Art of War. New York:
Simon and Schuster Publication, 1984.

McDaniel, N.A. and Lorenzi, D.A. An Analysis of Joint Service
Programs. Newport, RI: Center for Advanced Research,
Naval War College, 1979.

McKittrick, Jeffrey S. Reforming the Joint Military
Establishment. Naval War College, Newport, RI: Center
for Advance Research, 1985.

U.S. General Accounting Office. Joint Major System
Acquisition by the Military Services: An Elusive
Strategy. Washington: 1983.