STUDY PROJECT

CLOSE AIR SUPPORT - A CASE FOR DIVESTITURE PLANNING IN THE DEPARTMENT OF DEFENSE (DOD)

BY

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USAWC MILITARY STUDIES PROGRAM PAPER

CLOSE AIR SUPPORT - A CASE FOR DIVESTITURE PLANNING IN THE DEPARTMENT OF DEFENSE (DOD)

AN INDIVIDUAL STUDY PROJECT

by

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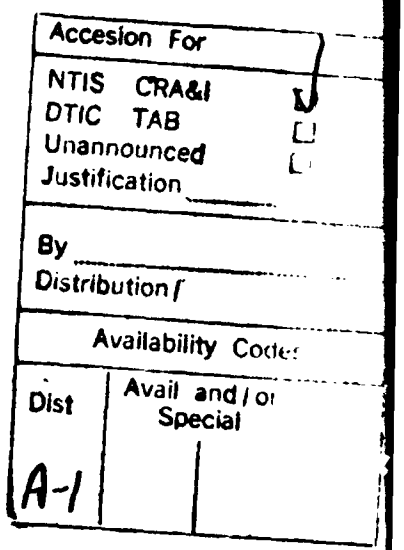

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CHAPTER ONE

INTRODUCTION

> "A ship that spends long periods of time at sea needs to be cleansed of its barnacles or their drag will deprive it of speed and maneuverability."[1]
>
> Peter F. Drucker

Recently, the United States Congress, in an amendment to the base closure legislation, directed the Secretary of Defense to:

> "conduct an independent assessment of the . . . close air support (CAS) aircraft alternatives for meeting military requirements of the United States; to develop an operational test plan for a competitive fly-off of alternatives, and; to assess the feasibility of transferring the CAS mission to the Army."[2]

This action not only stirred the coals of a long-standing debate over close air support but it also raised a more fundamental question concerning the adequacy of DOD's ability to cleanse itself of barnacles.

Barnacles form slowly beneath the water line of ships where the irregular shape that they impart to the hull increases drag. While their presense beneath the water-line may cause them to go unnoticed, their effect is to increase operating costs. For this reason, every good ship owner ensures that barnacle removal is done routinely with other maintenance.

The barnacles on the Department of Defense 'ship' are those research and development or production programs that have outlived their usefulness yet continue to consume resources. Unless routine removal is part of the acquisition process, barnacles will continue to consume resources until some outside influence (e.g. Congress) intervenes.

The question of barnacle cleansing is, of course, one of degree rather than design. The services routinely terminate many R&D programs and weapon systems. However, the systems that are removed usually are replaced in kind as part of a modernization process. The 'problem' systems, like DIVAD, incorporate technologies or provide support for functions that have passed their maturity. To minimize the lose of resources devoted to programs of declining value, acquisition management procedures must identify them early and deliberately plan for their elimination. Everything ultimately becomes obsolete. Only through effective divestiture planning can we ensure that scarce resources are not wasted at the end of a program's life span.

The purpose of this paper is to use the Close Air Support debate as a means to examine divestiture procedures within DOD's acquisition management system. In view of evolving technology and the current threat, does it make sense to devote scarce resources to a manned aircraft dedicated to reinforcing existing combat capabilities at the FLOT? If not, is there some shortcoming in DoD's acquisition management system that prevents it from divesting itself of the current Close Air

Support System, or any system, that is of marginal value to the force?

ENDNOTES

1. Peter F. Drucker, Managing in Turbulent Times, p. 43.

2. US Congress, Base Closure Amendment to the 1989 Department of Defense Authorization Bill, (Public Law 100-456), Dec 1988.

CHAPTER 2

CLOSE AIR SUPPORT - A 40 YEAR DEBATE

Background

The CAS dialogue between the Army and the Air Force has been on-going since 1948 when service responsibilities and missions were resolved in the Key West agreements. Several subsequent agreements including the 1949 Bradley-Vandenburg Agreement, the 1951 Pace-Finletter Memorandum of Understanding, and a 1956 SECDEF Memorandum for Members of the Armed Forces shaped the service responsibilities for CAS and helped establish the bounds of Army rotary wing aircraft useage but left Air Force proponency unchanged. Throughout the dialogue, the Army has generally focused on operational requirements for CAS and deferred aircraft design to the Air Force.[1]

Until 1985, the debate centered around the issue of using a single versus a multi-mission aircraft for CAS. The Air Force consistently opted for a multi-purpose aircraft capable of performing both the CAS and Air Interdiction (AI) missions while numerous Army studies, conducted over the 40-year period, concluded that the CAS mission required a single-mission aircraft that was simple, rugged, reliable, easily maintained, and capable of immediate response in the forward battle area.[2] It would seem, therefore, that the A-10 was specifically designed and built to meet this long-standing Army requirement. But was it?

A-10 development occured over a period of significant changes. It began five years before the publication of the Army's 'Active Defense' doctrine upon which its justification was based, and three years before the bitter lessons of the Yom Kippur War. However, when the full production decision was made in 1976, the lessons of the 1973 Middle East War were well known and had, in fact, shaped doctrine. Yet, there were no changes in the basic design of the aircraft. Further, it was well known and mutually agreed between the two services that CAS had to remain fourth in Air Force tactical air support priorities behind air supremacy, air interdiction, and battlefield air interdiction.[3] The A-10 was, in reality, obsolete before it was fielded. Therefore, one must assume, and available evidence suggests, that the A-10 production was influenced by factors other than the Army's stated tactical requirements.

The growing Army involvement with rotary wing aircraft in the late 1960's provided the real impetus for change in the Air Force's long-standing position regarding its need for a multi-purpose aircraft to fulfill the CAS mission. It was at this time that the Army, building on its Vietnam experience, began developing the Cheyenne helicopter to provide escort protection for its troop-carrying helicopters. Whether intended or not the Cheyenne would also provide a CAS capability under the Army's exclusive control. Recognizing the threat that Cheyenne posed to its CAS mission, the Air Force reversed its position, gave up its demand for a multi-purpose aircraft, and adopted, instead, the production of a dedicated CAS aircraft. As a result, the Cheyenne program was terminated, the Army got its dedicated "mud fighter", and the Air Force

retained its CAS mission. [4]

A Changed Tactical Environment

A lot has happened since then. The two services have developed the Joint Air Attack (JAAT) doctrine to control the joint employment of Attack Helicopters and fixed-wing aircraft; the Army has begun fielding the AH-64; and the Airland Battle doctrine has dramatically changed the way we plan to fight. The mid to high intensity battlefield of the 1990's envisioned under Airland Battle doctrine will be a fluid, non-linear, and highly lethal environment where it will be difficult, or impossible, to distinguish the front line of troops. The tempo of operations will likely be faster than the CAS planning cycle. In this environment, the enemy's air defenses will challenge the survival of any manned fighter and significantly reduce the probability of finding and killing targets close to the FLOT.

The services have not completely ignored this changing situation; however, their actions have done more to perpetuate traditional roles and missions than to seek innovative solutions to dramatic environmental changes. In a CSA-CSAF Memorandum of Understanding (May 85), the services agreed on two fundamental points: that the A-10 <u>will not</u> meet the requirements of the Airland battlefield and; more importantly, that a fixed-wing, multi-purpose replacement aircraft should be developed to replace it.[5] Thus, the Chiefs dismissed all other options for providing support to ground forces in contact, and returned, instead, to the 40-year old Air Force solution - a multi-purpose jet fighter.

Time for Reconsideration?

A paraphrase of definitions from several sources including TACM 2-1, and ATP 33 defines CAS as :

> "...air attack(s) requested by the ground commander, against hostile targets which are in close proximity to friendly forces and which need the detailed integration of each air mission with the fire and movement of those forces."[6]

The fundamental constant amidst all of the changes mentioned above has been the requirement for support in close proximity to friendly forces. It is this requirement for support at the FLOT , generally accepted as inside the Fire Support Coordination Line, that creates the greatest difficulty for the system designers. Here, the engagement timeline is most severely constrained, the target engagement problem most technologically difficult (and expensive) to solve, and the air space most lethal to the manned aircraft.

Consider first the situation in which a CAS mission might be requested. For discussion purposes, the friendly force is a battalion since this is the lowest echelon at which a Forward Air Controller (FAC) is located. There are essentially three scenarios which would normally warrant CAS assistance. Friendly forces are: (1) involved in a meeting engagement; (2) observing a by-passing enemy force which cannot be ranged with direct fire; or (3) are being penetrated by a superior enemy force. A fourth situation exists in which the enemy has been halted;

however, in this case, CAS is not needed.

In each case, time is the critical factor to the force in contact. From their perspective, direct fire weapons are responsive; all else is not. Even in an infantry war such as Vietnam, where the friendly force enjoyed air superiority and "the front line" was relatively stationary, average response times exceeded thirty minutes (see Figure 2-1). On a high intensity battlefield, response times of this magnitude to get a typical CAS mission through its complex, centralized, control system and over the target area is too long.

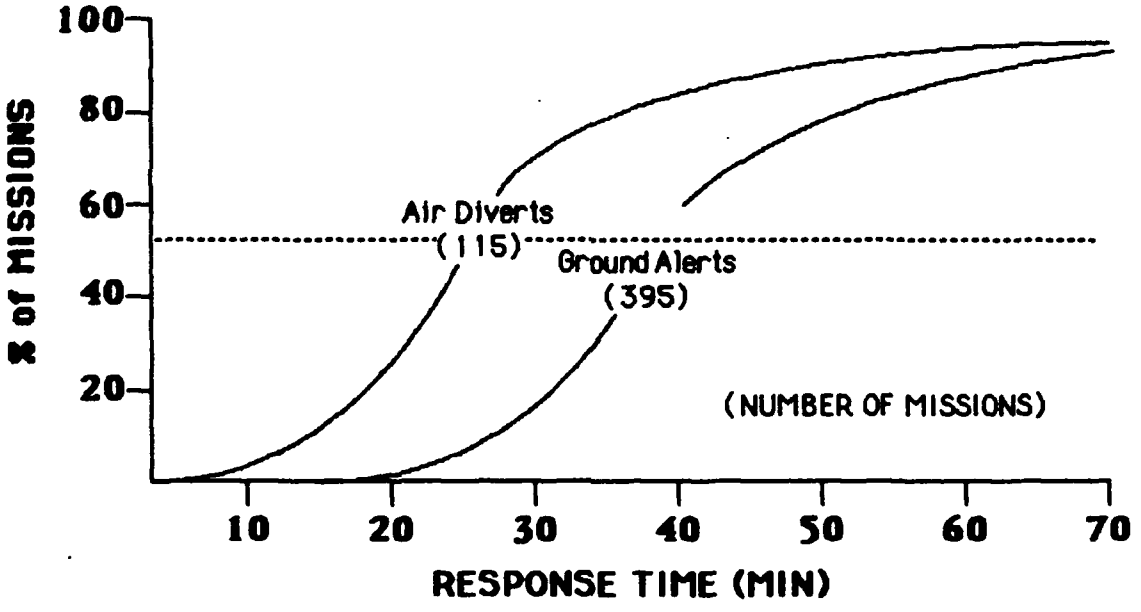

Figure 2-1: Tactical Air Response Time - Vietnam, Oct-Nov 1969

A soviet-style attack moves at 20 kph. In this environment, targets are fleeting and the likelihood of a single soldier (e.g., a Forward Air Controller) being able to watch a target for more than a couple of minutes is remote. Even if the FAC's vantage point and the terrain permitted it, normal battlefield fog and friction would prevent sustained 3-way contact between target, FAC, and CAS aircraft. It may be for these reasons that the Army has consistently placed responsiveness at the head of the requirements list. Unfortunately, the the Army and Air Force perceptions of responsiveness are widely different and there is little hope of closing the gap.

Disregard, for a moment, the complex nature of the existing centralized TACAIR control system, the limited availability of aircraft to support the fifth priority mission, and the fog and friction at the point of contact. Assume that an aircraft is immediately available for the mission. Where in this vast terrain beneath him is the target? What kind of target is it?

Battlefields are normally confused with friend and foe intermingled. One vehicle looks much like another at firing range. Stationary tracked vehicles are especially difficult to detect - especially if they don't want to be. The acquisition task is further complicated by the smoke of battle , gun smoke, diesel exhaust fumes, and dust from exploding artillery. The terrain itself may screen targets, particularly where it is mountainous or

rolling. And under adverse weather, even with modern thermal imaging devices, a stationary target is hard to detect and recognize. From a high speed fighter, the acguisition task is infinitely more difficult.

Look at the task from the fighter pilot's point of view. He is flying at high speed over unfamiliar terrain. He will probably be presented, not with one target to attack, but several. Once he gets close to the target area, he must sort out friend from foe, isolate his target, take up the correct attack angle and direction, and maintain that attitude for a finite time until he launches his ordnance. Because of the difficulty of acguiring targets from the air, the pilot is dependent upon help from the ground in the form of a Forward Air Controller (FAC)

While the FAC is responsible for guiding the aircraft to the target, a host of challenges inhibit him from performing his task reliably and efficiently. First, he must be able to see both the aircraft and the target simultaneously so that he can talk the pilot onto the target - difficult task on the modern batttlefield where line-of-sight interruptions are frequent and targets are fleeting. Also, in a high ECM environment, the FAC is the only one on the ground who has the radios capable of talking to the aircraft. If he is incapacitated or out of position, the CAS aircraft can't be vectored to their targets. Finally, the requirement to initiate the attack over, or close to, the FAC position (mutual line of sight) constricts the optimum use of the inertial navigation systems on modern fighters which might otherwise allow a more optimal approach route.

Laser designators used for target marking, dubbed, ". . .the biggest breakthrough in acquisition of battlefield targets during the short history of aerial warfare."[9] may improve the efficiency of the task. If the laser target marking device incorporates a position location system and a ranging capability, the FAC, theoretically, can pass accurate grid coordinates directly to the pilot theerby eliminating the need for continuous and mutual line of sight.

However, there are some drawbacks. Sensors that detect laser energy are inexpensive alarms that, if mounted on enemy tanks and infantry fighting vehicles, can alert the vehicle crew and allow it to seek cover. A slightly more sophisticated version could be employed to assist in divulging the FAC's location and to permit his suppression before the aircraft arrives. Finally, a laser marking system is not cheap and only adds to a steadily increasing cost of the CAS mission.

Responsiveness and acquisition difficulties aside, much of the current debate dwells on the vulnerability of fixed wing aircraft in the low altitude regime of modern air defenses. The Soviet Union has provided its ground forces, its Warsaw Pact allies, and its client states with a formidable array of air defenses including large numbers of surface-based missiles, anti-aircraft guns, and all-weather fighters tied together in a comprehensive command and control system. The efficiency of the air defense system was demonstrated to the Israeli Air Force during the early days of the Yom Kippur War fifteen years ago.

Since then, Warsaw Pact air defenses have been continuously upgraded. Modern look-down, shoot-down fighters have been fielded along with AWACS aircraft to supplement surface radars. These radars and the highly mobile SAMs have progressively diminished the feasibility of low altitude CAS operations. How vulnerable CAS is to these defenses has been the subject of considerable analysis all of which is sensitive to assumptions, inputs, and scenarios. Expected losses vary enormously and only serve to reinforce the conclusion that effective fixed-wing CAS is not likely on the high-intensity battlefield without substantial loss of aircraft.

Are There Other Options?

With all of these factors working against the success of a CAS mission, it is time to consider some alternatives and their consequences. One option is to rely totally upon the Army's weapons for the close battle and save the fighter for the more profitable interdiction missions. Army weapons are immediate, responsive, all weather, day/night, and cheaper than aircraft. Appache and MLRS are now available to take up some of the CAS mission if necessary. These systems are capable of reinforcing the ground forces at the FLOT responsively, accurately, and at considerably less cost than a new $35 million fighter.

This option provides a number of advantages to the land forces commander. First, from an operational viewpoint, fighters can now be exclusively targeted against the enemy's lifelines and follow-on forces. These attacks will not only destroy enemy targets but also cause him to

disperse and seek concealment in his rear area where he normally would expect to have freedom of movement. The result will be a slowdown of his operational tempo. Second, the exclusive use of our fighter assets in the enemy's rear will force him to disperse his air defense assets to cover potential fighter penetration routes which will clearly be along avenues where the enemy is not concentrated. This should complicate his ADA command and control and reduce the vulnerability of our fighters. Third, if our fighters are not operated over our own troops as a matter of doctrine, the rules of engagement for our air defenses are simplified and the probability of fratricide reduced.

A second option is to exploit the advantages of Unmanned Aerial Vehicle (UAV) technology. This technology was demonstrated by the Israeli forces during the Lebanon incursion with great success. The cost of UAVs will vary from one to ten percent of a new fighter dependent upon the requirements.[10] UAVs eliminate the risk to pilots and the associated support structure. They could also assume some of the reconnaissance and Suppression of Enemy Air Defences (SEAD) missions, both of which are infrequently discussed prerequisites for CAS. If they can also designate for the growing arsenal of smart, over-the-horizon, munitions, UAVs may also take over a principle portion of the CAS mission at least on the high-intensity battlefield.

All of these arguments against fixed-wing CAS do not mean that there is no place on the modern battlefield for the manned fighter - only that its place is not over the FLOT in close proximity to friendly troops.

Air superiority, deep interdiction, and offensive counter-air capabilities are vital to the success of AirLand Battle. Fighter aircraft should be designed for those missions.

There is little question that technology can overcome all of the current weaknesses of the manned CAS aircraft; but at what cost? Special materials and shapes can minimize radar cross section to help avoid radar-directed air defenses. Avionics can be developed to increase the probable success of high-speed, low-level navigation, target acquisition, and ordnance delivery. And the command and control system can be streamlined with secure, digital communications and automated mission planning capabilities. However, all of these improvements have one thing in common. They increase the cost of the manned aircraft CAS system with little hope of significantly improving it. On the other hand, these are the same technologies that make UAVs possible.

Conclusion

At a time when defense dollars are dwindling and, more importantly, when the environment and technology of war is changing, we need to stop trying to optimize obsolete systems and doctrine. At some point in every operational system, there comes a time when improvement is more costly than the resulting gain. Better becomes the enemy of good enough. Instead of operating, and spending, on the margin of success, we must shift our vision to the future and find the systems and techniques that will enable us to shape the battlefield environment to our advantage.

A recommendation for the reallignment of the CAS mission is not the intent of this paper, though the arguments for it appear strong (at the unclassified level). However, it offers the kind of competitive advantages that we should be seeking - better use of limited forces, neutralization of a portion of the enemy's sizeable air defense force, and the possible development of a technology with enormous potential for assisting or assuming other battlefield missions such as reconnaissance, SEAD, EW, and command and control. The overarching question, however, is whether or not DOD policies and proceedures will support a radical technological change in a current operational system or a cross-service mission reallignment.

ENDNOTES

1. Charles E. Kirkpatrick, Maj, The Army and the A-10: The Army's Role in Developing Close Air Support Aircraft, 1961-1971, Washington: U.S. Army Center of Military History, 1985, pg 7-8.

2. Ibid., p. 34

3. Ibid., p. 33

4. Morton and David Halperin, "The Key West Key", Foreign Relations, No 53, Winter '83-'84, pg 119

5. General Robert D. Russ, "Battlefield of the 1990s", Defense 88, Jul-Aug 1988, pg 13.

6. Department of the Air Force, AF ATP 33: Air Support,

8. Department of the Air Force, Tactical Air Support in South Vietnam Oct-Nov 1966, pp IV-10

9. Marshall J. R. Walker, Air Vice Marshal, Air to Ground Operations, London: Brassey's Defense Publishers, 1987, pg111.

10. Capt J. D. Williams, "Role of the Fighter Aircraft on the Modern Battlefield", Marine Corps Gazette, May 1984.

CHAPTER 3

THE CURRENT SYSTEM: FORM OVER FUNCTION?

> "In order to devise the best form that the means should take, you must first gain an understanding of the functional demands that must be met."[1]
>
> BG E. M. Lynch (USA, Ret)

Introduction

The CAS debate continues, in part, because the DoD acquisition management policies and procedures are inadequate to resolve functional issues. They focus on systems and acquisition efficiencies instead of functions and functional boundaries and they fail to provide fiscal authority to resolve the difference. This is particularly true for systems that, like CAS, satisfy the functional needs of two or more services or service branches. Because of these inadequacies, divestiture planning is done on an ad hoc basis usually as the result of congressional initiatives such as the recent CAS directive quoted at the introduction.

Guidance

One source of the problem is the Office of Management and Budget (OMB) Circular A-109 which established the life cycle system upon which all subsequent guidance concerning system acquisition is based. Published in 1972, OMB Cir A-109's intent was to reduce cost overruns and diminish the controversy over the need for new systems. It outlined an acquisition process that begins with individual agencies' analysis of their capability to perform their assigned mission and proceeds through

the identification of deficiencies to resolution after alternatives have been considered. Policy regarding the termination phase of a program was not addressed.[2] Thus, it is not surprising that the subject of divestiture planning is not included in the primary DoD acquisition management directive.

DoD Circular 5000.1 - Major and Non-Major Acquisition Programs - focuses on the early stages of an acquisition program. It establishes policies, practices and procedures for the acquisition of major systems and requires, among other things, a tailored acquisition strategy to minimize development time through concurrency, competitive prototyping, simultaneous developmental and operational testing, and early definition of logistical requirements.[3] This front-end focus emphasizes efficiencies in the process of bringing a system to production but, until 1987, there was no mention of system management at the tail end of the life cycle.

In 1987, partially as a result of the Packard Commission Report, DoD Circular 5000.1 added a requirement for two new post-production reviews. One of these reviews, Milestone V, addresses system upgrade or replacement. During this review, the Defense Acquisition Board (DAB) is required to consider the following issues:

- the systems capability to continue to meet its original or evolved requirements;
- the necessity for modifications to meet requirements or service life extensions;
- changes in threat that require increased capability;

- changes in technologies offering significant breakthrough in system worth; or

- disposition of displaced equipment.[4]

Note that all of these considerations address the upgrade, replacement-in-kind, or retirement of the particular system under review. No explicit requirement exists for consideration of the supported function to determine if it can be better satisfied in a different manner or with different technology. As a result of this omission, the Milestone V review may tend to perpetuate system upgrades and new starts of like-systems.

The timing of the Milestone V review, 5-10 years after initial deployment, also contributes to a 'systems' focus. Because the 8 - 15 years that it typically requires to develop a new system, either technological obsolescence or a deficiency in the face of an evolving threat will almost certainly lend a degree of urgency to the proceedings. This sense of urgency will reinforce the advocates' arguments for upgrade or replacement and discourage the type of functional review required to support a shift in technologies for meeting the functional needs.

The 1985 CAS agreement between the Air Force and Army is an example of a compromise born of urgency. In this case, the urgency was to replace the A-10 aircraft in the face of an ever increasing Soviet air defense threat. The two services agreed that the A-10 could not

effectively support the Army's Airland Battle doctrine (which had been published three years earlier) and, therefore, had to be replaced as soon as possible.[5] Several studies and much staff work has been done by both services to determine the requirements for the follow-on aircraft. A special task force - Close Air Support Mission Area Support Group (CASMARC) - was established by SECDEF to "jointly develop and monitor aircraft design efforts".[6] However, the original 1985 agreement to replace the A-10 with another aircraft as opposed to any other solution remains in effect in part because of the perceived risk associated with failing to fill the hole left by the A-10 retirement.

It can be argued that a functional assessment should be done in conjunction with the requirements validation process instead of a decade after a system's fielding. In this case, divestiture planning would be done at the front end, rather than the tail end, of the system's life cycle where interests and urgency are not as strong. Again, however, DOD directives don't support this approach.

At the beginning of a system's life cycle, DOD Directive 5000.1 requires analyses of alternative approaches to satisfying all major new starts. According to this directive, the analyses should consider:

- Changes in US or Allied concepts and Doctrine
- Use of existing commercial systems
- Modification or improvement of existing defense systems
- A cooperative program with an Allied nation [7]

A new acquisition program will only be considered after these analyses are completed and concurrent with the OSD POM review based on the justification provided by the service component. The proposal for a system new start is embodied in a Mission Need Statement that addresses the following decision information:

- Defense Guidance (DG) element to which the acquisition responds,
- Mission areas and threat analysis and shortfalls of existing systems to meet the threat,
- Cooperative opportunities to be explored - inter-service and international,
- State of technology needed,
- Funding implications and affordability,
- Constraints in the areas such as reliability, mauntainability, and survivability.[8]

The Defense Acquisition Executive (DAE) approves the MNS at Milestone 0. This major step in the program authorizes the component to proceed to the concept exploration phase and grants authority to budget for the program. Milestone 0, therefore, becomes a critical step in the life of a program. A sponsoring agency/service must provide as much supporting information as possible if it wants the program to survive. As part of this information requirement, the sponsoring component must address affordability and the level of funding it is willing to commit. To do this, cost estimates must be developed before a concept should have been selected.

" Because of this request or expectation, the services is put in an untenable position. It must limit the number of

> alternatives to be considered well before Milestone 0 if they are to develop realistic cost estimates for the MNS or they will submit only the most conservative of cost estimates to avoid unwarranted or premature demise of their proposal.[9]

It has been suggested that DOD would be better served if a Program element and its associated budgeting authority were not assigned until the services completed a less restrictive concept exploration phase. To pay for the proposal, OSD would retain a portion of the research and development (R&D) funds and have the Defense Acquisition Board allocate them.[10]

The Army's Concept Based Development System (CBRS) might provide a model for DoD's management of requirements. Under this system, the Army places requirements in a higher-order framework using a heirarchy of operational concepts. From the umbrella concept of AirLand Battle (FM 100-5), the Army develops mission area and battlefield concepts describing battlefield capabilities that, when analyszed, articulate deficiencies leading to the development of doctrine, training, organization, and materiel.[11] The system includes the management procedures for the identification, review, and tracking of concepts under development. It also distinguishes between current and future methods of satisfying needs without specifying means (e.g., specific weapon systems).

But the CBRS is not without faults. One of the objections to the

system is that it tends to be deficiency rather than opportunity oriented -- a criticism which may be encouraged more by viewpoint or need-to-know than by fact. However, the proponents of operational concepts are normally the branch schools which have traditional methods of accomplishing battlefield tasks. Also their approach to combat developments, guided by the CBRS system and current DoD guidance, tends to favor the non-materiel solution first, followed next, by the least expensive materiel solution (e.g., a Product Improvement). Under this system, it is exceedingly difficult to find support for 'solutions' to battlefield requirements which do not allign with a proponent's traditional method of operation or which requires fiscal support from several proponents. Thus, radical changes that may provide opportunities for significant battlefield advantage may be hampered by the very system which is supposed to foster their identification and development.

The fault, however, is not simply proponent myopia or proprietary interests, but rather, with the management system that focuses on front-end and weapons effectiveness analysis rather than the analysis of system-independent battlefield functions. The operational concepts developed under CBRS are useful; however, they are not taken to their logical conclusion. Approval of an operational concept should include identification of the specific functions (and their associated performance parameters) that are critical to its success. Further, they should identify all systems that contribute to the performance of each function. This type of functional analysis would identify the minor or non-contributors to functional success and could, if required by

management, result in a plan for divesting the 'weak sisters'.

Regardless of the model used, the proposal for DoD to assume the management of requirements provides the opportunity to overcome the system's focus. If OSD had the fiscal authority for conceptual analysis, the requirements could begin with a definition of the function being supported by the proposed system. When the function and its requirements are understood and agreed upon, a functional analysis including all technologically feasible options for satisfying them would be accomplished by a DOD task force. A plan for divesting the current system(s) would be among the outcomes of this analysis.

The plan would define the divestiture milestones in terms either of absolute dates or technological windows. If technology currently exists, the recommendation might be to terminate the current method and associated systems (e.g. the A-10). The decision makers would have to agree that the risk associated with not buying a follow-on aircraft is acceptable given the cost savings, some or all of which must be spent on the emerging technology. On the other hand, if the alternative technology(s) are not ready for fielding and the risk of not having this capability is too great, the decision would be to field a follow-on aircraft but re-examine the function again when specific technologies mature. In either case, divestiture of the current way of doing business, not necessarily a particular system, is made part of the formal decision process and divestiture would be linked to acquisition.

Life Cycle or Life Span?

Figure 3-1 illustrates the dilemma from a different perspective and shows why divestiture planning can only be done within the context of a functional point of view. System managers orient on system requirements and front-end acquisition planning for what is usually a series of life-cycles. Each system in the chain represents an improved (and usually more expensive) version of its predecessor. The current advocacy system requires, rightly, that the system managers champion their systems. Only through their efforts can the services ensure that they get the best possible systems. However, barring any other influence, it also ensures the continuation of the system's method of meeting the functional requirement.

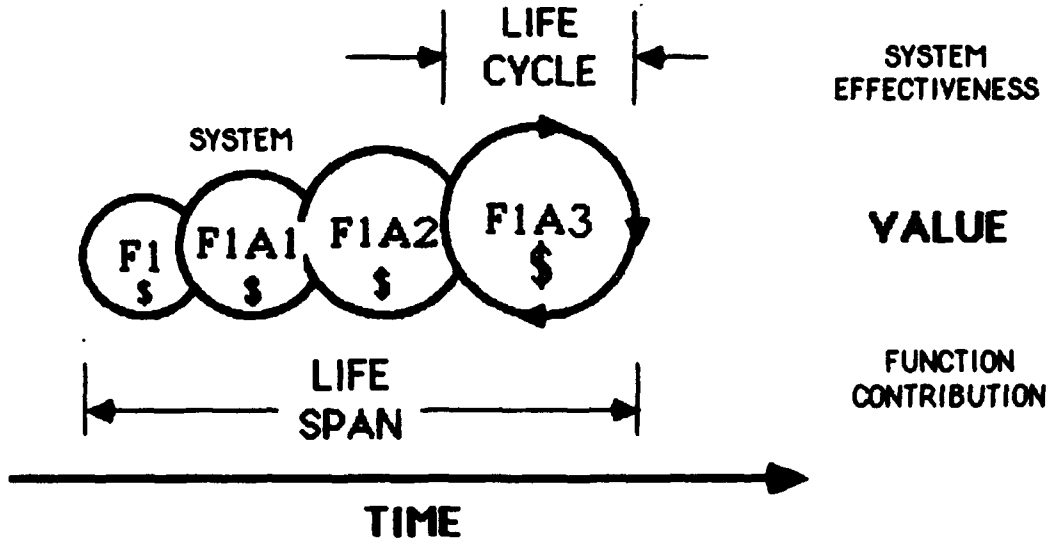

FIGURE 3-1: Life Cycle versus Life Span

A functional analysis system, on the other hand, would provide the

forum necessary for balancing the advocate's views against the overall needs of DoD and available resources. The functional managers would be the ones concerned with battlefield functional requirements and alternative technological means of meeting them. Their focus would be on determining when, in its life span, a type-system begins to decline in utility. They would always be asking the question, 'If we weren't in this [method] already, would we go into it knowing what we now know?' If the answer is, 'No,' they would be asking, 'How can we get out; or at least, how can we stop putting additional resources in?'[12] For CAS, the issue is whether it makes better sense to spend an estimated $35M/copy on another manned aircraft or change the method by which the CAS function is provided? Without a DoD-level analysis cell that focuses on functions instead of systems, the natural system-oriented and component biases will continue.

Conclusion

Congressional intervention in the CAS debate may have been inevitable because the policies and practices of the DOD acquisition management system do not provide for the examination of the function that CAS supports, the active search for alternative methods of meeting the functional needs, or the investigation of the means and effects (i.e., risk) of divesting the current A-10 fleet. Function must precede form. Unless some means of funding unconstrained conceptual analysis is established, the forest will remain lost in the trees.

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4. Department of Defense, DOD Directive 5000.2: Major Defense Acquisition Program Procedures, pp. 4

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6. Ibid.

7. DOD Directive 5000.1, pp. 4

8. DOD Directive 5000.2, pp. 3-1

9. H. Marshall Ward, LTC, Is Our Acquisition Process Responsive to Our Joint Warfighting Needs?, pp 14.

10. Ibid., Pp 22.

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12. Drucker, pp. 42.

CHAPTER FOUR

SLOUGHING OFF YESTERDAY

"All large organizations need to aggressively pursue divestiture strategies to ensure that they do not retain outdated or outmoded policies, doctrines, weapons systems, or research and development programs."[1]

MG Perry M. Smith

Incentives

There are compelling reasons for pursuing a means for effective divestiture planning. First, the trend in technological change is upward. The next 25 years will be witness to ever increasing turbulence caused by technological change. Effective managers will be those who can operate effectively in this environment.[2] Michael Porter, writing about competition in business, concludes that industries in decline,

> "have probably increased with slower world economic growth, product substitution resulting from rapid cost inflation, and continued technological change in areas like electronics, computers, and chemicals."[3]

Porter's observation about the world industrial economic trend probably applies equally to the military establishment where budget authority is declining and weapons systems are becoming increasingly dependent on electronics and computers. The only way to curb ever-increasing systems costs may be by "product substitution" using state-of-the-art technologies packaged in radically different forms. The

battlefield functions, however, are likely to remain. Thus, as new technologies arrive, DOD must have the organizational and procedural means to optimize them against functions and not simply adapt them to an existing form (i.e., weapon system). Manufacturing techniques may have to change to keep pace. This increased rate of change must bring with it an ever-increasing need for attention to the means of retiring obsolete systems.

Second, there is a potentially large cost avoidance associated with a timely divestiture decision. As discussed earlier, most DOD hardware systems evolve through one or more modernization cycles. Each cycle may be either a Product Improvement (PI), a service Life Extension Program (SLEP), or a new start. Thus, depending upon when the divestiture decision is made, the associated savings could be as low as the phase out costs of a system in being (e.g. the A-10), or as high as the

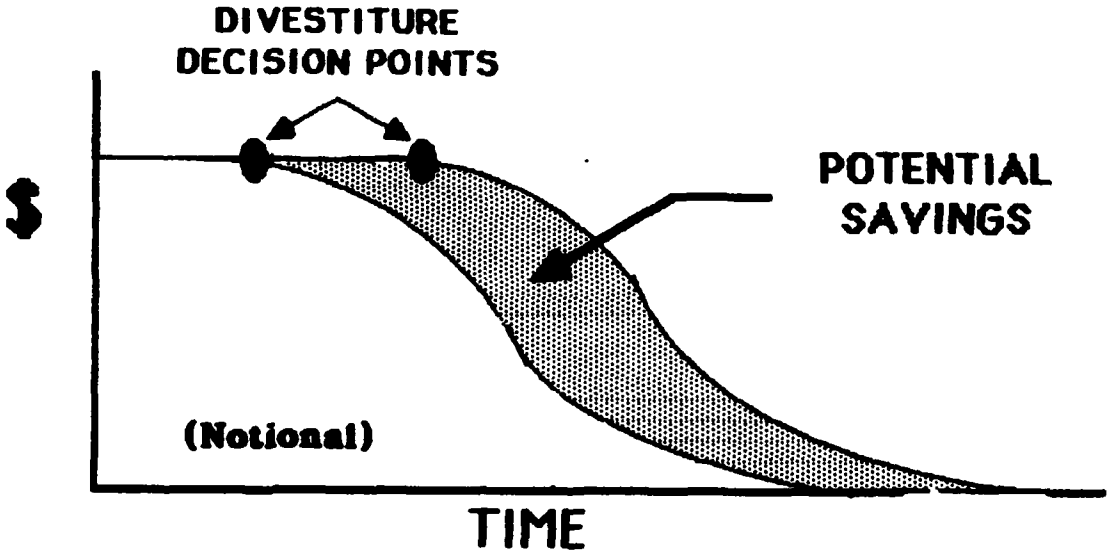

FIGURE 4-1 : Divestiture Opportunity Cost

life cycle cost of a replacement system. Clearly, the amount of resources 'wasted', increases with any delay after a system has entered the declining phase - resources that could be more effectively spent on emerging systems.

By acknowledging these realities, divestiture planning will help balance the need for change with the resulting affects on the organization. Properly done, it should minimize the impact on the organizational structure that supports the systems being divested and, at least, ensure a graceful retirement process. This chapter will examine the barriers to change and suggest methods to overcome them.

Exit Barriers

While there are attractive incentives for divestiture planning, there are equally pressing disincentives. They include both hardware and human effects within a service as well as some strategic considerations for DOD.

The hardware-related problems of divestiture are the easiest to solve. They include sale, transfer, and/or asset retirement; logistic support during the divestiture period; and the sustainment of a trained capability until the system is out of the inventory. Also, if the system is divested through Foreign Military Sales, the preservation of the support base may be required long after the system is out of the US inventory. Nonetheless, these are rather straightforward requirements for which

the services have ample experience.

By far, the most difficult barriers to overcome are the human ones related to jobs, power, prestige, and emotional commitment. Every weapon system carries with it both military and civilian job requirements that only vary in degree of commitment. In the Army, for example, an infantryman may be assigned as a gunner for the Dragon Antitank weapon - a temporary assignment requiring limited preliminary training. Larger weapons systems tend to have higher entry-level training requirements, longer associations, and stronger system ties. It is this strength of commitment, particularly in senior leaders, that makes divestiture decisions difficult.[4]

In the case of Close Air Support, for example, many of the senior leaders of the Air Force are ex-fighter pilots who are wedded to the CAS function by many years of service. Throughout their careers, they have ,likely, been trained, indoctrinated, and involved in CAS-related acquisition decisions. It would be only natural for them to oppose divestiture of the CAS mission. For this reason, the burden of deciding when to exit (ie., to divest or restructure the CAS system) must fall on top management above the service level. Porter points out that even at these high levels (e.g., JCS or OSD), identification with the [function] can be, "particularly strong if they are long-standing,...are part of the historical core, or were acquired [as with a weapon system] with the encumbant's direct participation."[5]

This train of logic leads quickly to the unfortunate conclusion that DOD, by virtue of the long-standing associations of its members, is incapable of resolving functional, or roles and missions, issues that cross service lines. Thus, the role of Congress as arbitrator and decision maker may be inevitable. Recent Congressional intervention in the CAS debate tends to reinforce this view.[6]

Unfortunately, this method of resolving issues transfers the decision making process from those who have the expertise, experience, and interests to ensure that tradeoffs are made on the basis of sound tactical principles and military judgement to those whose basis of decision is political. While the loss of civilian jobs under almost any divestiture plan will inevitably attract congressional interest, the military division of opinion should not be simultaneously laundered. A clear, unambiguous, and logically derived DOD position can, and should be, derived before the political pressures of the POM cycle set in.

Even if the divestiture action faced no opposition from either hardware retirement costs or human commitment considerations, it may face barriers due to the system's importance to the service. The system in question may be central to a services identity or image. Or it may be that exiting may damage the services clout in the budgetary process; even reduce its Total Obligation Authority. An Air Force without its traditional mission of supporting the Army, for example, is anethma to anyone who understands its, the Air Force's, origins. Just the prospect of this image prevailing through the budgetary fights may be enough to

prevent such a simple decision as an 'adjustment' of service budgets to reflect the lack of priority that CAS has within the Air Force missions.

Much of the CAS function - the delivery of additional ordnance within close proximity to friendly troops - is performed by the Army. The Air Force's capacity for CAS would not dissolve if the A-10 was divested tomorrow. Yet, because of any or all of these barriers, it may continue to build or upgrade its CAS systems to meet perceived Army needs though their contribution to the function they serve is of marginal or questionable effect. In effect, the height of the exit barriers may overshadow the perceived need to exit.

Overcoming the Barriers

Divestiture planning in the business world, where economic analysis is normally used to point to areas of decline, is relatively easy. In the military, however, obsolete areas are harder to find and more difficult to exorcise for all of the reasons just discussed. Nonetheless, the limited literature in this area points to several methods for improving the likelihood that obsolescence will be identified and, thus, create the opportunity for timely divestiture planning. Among them are:

- <u>functional analysis at DoD level</u>. Routinely done, functional area analysis will ensure that divestiture occurs as part of a long-term plan rather than a short-term political or budgetary necessity. Including functional analysis in the system acquisition process will help to build concensus among the DoD leadership by raising acquisition issues above

the system effectiveness level. It will bring the rationale for system procurement more in line with the perspective of the leadership, who themselves must sell the need to the Congress. For example, a trade-off decision between manned aircraft to replace the A-10, while appropriate at the Air Staff level, is meaningless at the DoD level where trade-offs should be between all systems and technologies capable of performing the same function. A second advantage of the functional analysis approach is that it will raise the consciousness level of decision makers to the reality of obsolescence in acquisition decisions and force them to overcome a problem that all leaders face - a reluctance, "to develop a mindset which requires spending considerable time planning for a period beyond [their] tenure."[7]

Several actions are required to institutionalize functional analysis in DOD. First, all functional areas need to be identified, defined in terms of their requirements, and agreed upon by the service components. They then need to be sorted by proponent with OSD/JCS retaining those that cross service boundaries. When this is done, functions and proponents need to be alligned with Program Elements and added to the Program Optimization and Budget Evaluation (PROBE) data base. Finally, a functional review system must be established at DOD level to ensure periodic reviews separate from system-level milestone reviews.

- Creation of an innovative environment. In an atmosphere of rapid technological change, many management experts agree that fostering of an innovative spirit will be critical to the health of

organizations. But defense is not business in the business sense. What works in a peace-time, profit-motivated environment may lead to defense solutions that cost lives on the battlefield. As Peter Drucker cautions, "Efficiency is doing things right; effectiveness is doing the right things. And doing the wrong things less expensively is not much help."

With this caution in mind, the military must find innovative ways to satisfy functional needs and eliminate the marginal contributors. The imperative of innovation is customer satisfaction, not the mechanical output of the production facility.[8] For the military, this imperative applies to weapon systems. If they are not responsive to the needs of the user, or to the needs of the receiver of their product, as in the CAS case, they should be modified, replaced, or eliminated. The military expends a lot of effort in human engineering and user testing to ensure that systems are user friendly but most of this effort is expended after tha form is set. If the goal is functional effectiveness, some attention should be focused at the pre-concept exploration phase identifying the physical and psychological parameters what will satisfy the user (or receiver) of the functional system.

Like any innovation building initiatives, the foundation must be built on participation from all levels of the organization.[9] Surveys, task forces, think tanks, etc., all can, and are, used to elicit ideas from users. For functional innovation, where the aim is to change the method in which a function is performed, the difficulty may be in freeing the

participants from prejudices of their past experiences while keeping their imaginations within technologically feasible boundaries.

DARPA's work in Simulation Networking (SIMNET) is a good example of functional innovation. Faced with weapons of increasing lethality, exotic capabilities for which peacetime training would be unsafe, a need for realistic unit training at reduced O&S costs, and the prospect of rapidly changing technologies, the heavy force needed a method of performing the training function more effectively and efficiently. The user, in this case represented by the Armor School got together with the Defense Department Advanced Research Projects Agency (DARPA) to develop the requirements.

The architects of the system were soldiers, NCOs, and junior officers at the US Army Armor School who explained and demonstrated their needs to the DARPA engineers in a field environment over several months. Their efforts resulted in a set of technologically feasible baseline requirements that the engineers then used to create the form of the final system. By participating with the soldiers before any 'metal was bent,' the engineers gained 'battlefield insight' that proved invaluable during the course of the system development and the users ensured that the final product would include their critical functional needs.

It is difficult, in hindsight, to identify where the original idea for SIMNET originated. It is part of the "pre-history" that is common in an

innovative environment.[10] The important questions are: How many other equally good innovative ideas have washed up on the shore and not been captured?; Can we trust innovation to chance and ad hoc arrangements?; Is a permanent think-tank of soldiers and technocrats needed?;

- Commitment at DoD level. A decision to divest a major system will require strong commitment by DOD to overcome the opposition and barriers that will accompany it. In many of the writings in the applied areas of strategic decision making and organizational change behavior, "visible management" and "statesmanship" are cited as critical to the implementation of any decision affecting change. Otherwise, why change?

> "Certainly not because of the vision of changes organizational environment and the need for new goals; most members below top management levels, most of the time, would have neither the information, the perspective, nor the feeling of responsibility to decide upon the need for radical change and act upon it."[11]

Leadership will have to champion the change, sell it to their services, and smooth the divestiture process. No divestiture should destroy the organization. Actions need to be taken to preserve as many jobs as possible and ensure cross-training to new ones where required. Education of the noneffected portions of the services can help by providing a support base for those effected by the change. Only top level management can prompt, plan for and implement an effective divestiture plan.

Leadership will certainly change over the implementation period of any divestiture plan. Therefore, once a functional decision involving the divestiture of one or more systems (and the emergence of others) is made, additional steps must be taken to ensure continuity of the change(s) and carry it through to completion. Periodic updates, with or without additional research, should be provided to new leadership to ensure understanding of the underlying rationale and program linkages. Procedures should be established to enbed the decision in the POM together with the linkage between new and old systems and their battlefield function.

Conclusion

Divestiture planning is like estate planning and should be done for the same reasons. It has the potential for considerable savings and it provides a plan where the alternative is only a knee-jerk reaction. The barriers that confront a divestiture decision involving a major system require that the decisions be made at DOD level. However, by formally planning for system divestiture, DOD decision makers will be forced to think above the system level and beyond current methods of performing battlefield functions. Their perspective also makes it more likely that new technology is introduced in the most cost effective form without regard to current systems. In the case of the current CAS debate, this type of system might have prevented Congressional intervention.

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1. Perry M Smith, MG, Taking Charge, pg 120

2. Peter Drucker, Managing in Turbulent Times, pp. 50.

3. Michael E. Porter, Competitive Strategies, pp. 254

4. Ibid., pp. 264.

5. Ibid.

6. Wildavski devotes a great deal of his book, Politics of the Budgetary Process, to the issue of roles and decision aids. He concludes that a system of service advocates, each providing a partial view of the public interest (PVPI), is preferrable to each attempting to provide a total view of the public interest (TVPI). His arguement is based on the observation that PVPI is simpler and has the added virtue of minimizing the danger of omitting important values which is more likely if each attempts to take the broader view.

7. Smith., pp. 122.

8. Kanter., pp. 22.

9. Ibid., pp. 244.

10. Ibid., pp. 282.

11. Ibid., pp. 262

CHAPTER 5

CONCLUSIONS

There is no formal requirement to conduct divestiture planning within the Department of Defense where current acquisition guidance focuses, almost exclusively, on the front end of the procurement process. There are two results: First, there is no routine procedure for resolving roles-and-missions related disputes between services particularly when one of the options is divestiture of a major system. Second, by failing to forecast system obsolescence and act on it through timely divestiture decisions, opportunities for potentially significant savings are lost.

While there have been some recommendations made to involve senior leadership earlier in the acquisition process by giving DoD the fiscal authority for the Concept Development phase, the recommendations fail to provide a higher-order, decision making framework to aid in the task. In other words, there is no common yardstick against which to measure the contribution, vice performance, of disparate systems. The Army's Concept Based Requirements System (CBRS) provides a useful framework based on a heirarchy of operational concepts, but it, too, fails to extend and link the concepts to a set of battlefield functional requirements which can be used in comparative analysis or a prioritization process. Divestiture planning has to be part of, and may provide the impetus for a system of functional requirements.

By formally planning for system divestiture, DoD decision makers will be forced to think above the system level and beyond current methods of performing battlefield functions. The higher perspective on which divestiture planning will have to be based also makes it more likely that new technology is introduced in the most cost effective manner without regard to the form of current systems.

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