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STRATEGIC AIRLIFT: A CASUALTY OF DEREGULATION

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INTRODUCTION

In any society, logistics is the means for bridging the gap between the national economy and a planned military operation. However, in a democracy, logistics planning must compete with other national objectives for an equitable distribution of that society's scarce resources. The share allocated to logistics must be effectively utilized to create and sustain military forces in support of National policies and objectives. Towards that goal, logistics is comprised of four principal processes: requirements determination, acquisition, distribution, and conservation. The suboptimization of one of these components can adversely effect the entire logistics function which would have severe consequences for the defense effort as a whole. In other words, it makes little sense to procure sophisticated equipment (acquisition), but lack the ability to expeditiously move it to the front lines (distribution).[1]

This paper will focus on the transportation component of the distribution process, specifically addressing the contention that the U.S. commercial aviation sector is no longer capable of fulfilling its wartime mission. The implication is that, without a fully responsive contingency distribution system, the logistics element would be unable to support national defense objectives. Clearly, without logistics a sustained war cannot be fought, let alone won. In a broad sense, this article will examine the deteriorating linkage between civilian wartime transportation providers and users (the Department

of Defense). Specific areas to be addressed include military transportation, strategic airlift, and several peripheral concerns of importance.

MILITARY TRANSPORTATION

Transportation has historically been recognized as a critical factor in the success (or failure) of military campaigns. During the War of 1812, the United States incurred enormous costs associated with transporting men and material, due to inadequate facilities and transportation routes. In fact, the almost universal opinion at the time was that those facilities could have been built for what it cost to cope without them.[2] Sokol notes that, once the situation has become stabilized, the logistics problem, primarily one of transportation, becomes of primary concern.[3] Similarly, General Douglas McArthur realized the importance of establishing and maintaining a viable logistical chain, stating that tactics can be decisively influenced by the means at hand for maneuvering, supplying, and controlling combat forces.[4]

Rather than investing in, and maintaining, transport resources necessary only for war, the U.S. policy has been to rely on the nation's commercial transportation industries to make their personnel and equipment available to the DOD should the need arise. This is in contrast to the Soviet Union, which maintains military airlift and sealift assets beyond those required to meet peacetime needs. The transport aircraft carry the livery of Aeroflot, the national airline, while the ships fly the flag of the merchant marine, but they are, in actuality, intended to satisfy contingency transport needs. In fact, our government has repeatedly turned to the civilian sector for its contingency transportation needs. Early in American history, the military practice was to contract with civilians for the provision of support functions such as transportation.[5] With the outbreak of World War I, the nation found itself with a private rail network unable to meet wartime transport demands. In order to win that

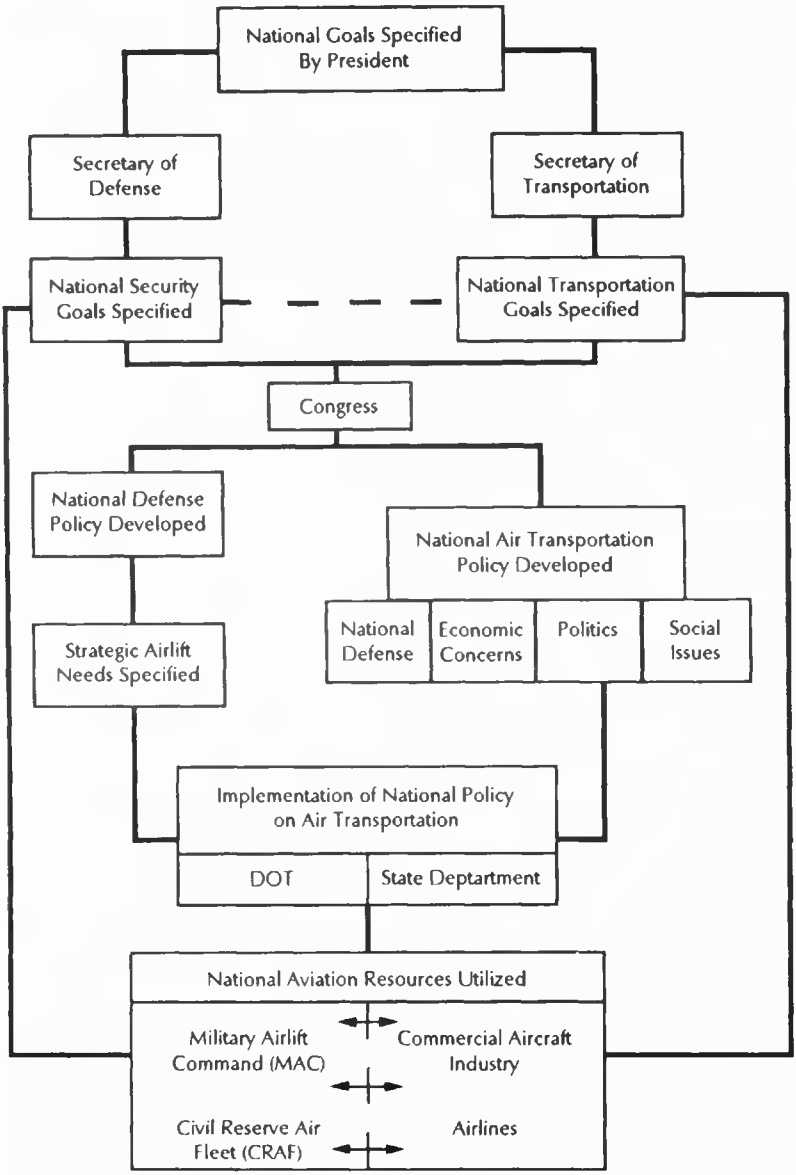

FIGURE 1. Air Transportation Policy Formulation & Implementation

conflict, the federal government took over the railroads in 1917 and ran the system until 1920.[6] This linkage between defense and commercial transportation interests continues to exist today, and forms the foundation for much of our total wartime movement capability.

An important characteristic of this relationship is that the government has exerted very little influence over the equipment developed for, and operated by, transport companies. Rather, the DOD "makes do" with planes, ships, and vehicles operated by firms whose profit-driven needs may be significantly different from those of defense planners. As an example, two mechanized air cargo handling systems have evolved over the years, one developed by the military and one by the civilian air carriers. The two are partially, though not totally, compatible, a situation that could be extremely limiting in a contingency. However, a larger and more serious problem arises when the needs of the carriers no longer coincide with those of national defense. For example, one of the initial results of airline deregulation was that carriers began operating smaller airplanes over shorter routes, often replacing larger aircraft with these new fuel efficient aircraft. Unfortunately, these new planes were of little use to the DOD, which still required large, long-range aircraft. We will return to this commonality question later.

The formal institutional relationship between national security and air transportation goals is depicted in figure 1. Haefele notes that it is national purpose--as articulated and expanded in national goals--that determines the structure of supporting policies.[7] Thus, the various cabinet Secretaries are concerned with establishing policies and objectives within their respective departments that will contribute to the attainment of the overall national objectives as specified by the President. However, the specification of national security goals also influences the development of transportation goals insofar as the nation's transport is expected to support the DOD. This may be, unfortunately, a one-way street. While national transportation policy includes a commitment to meet the needs of

national defense, defense policy is often developed with little regard for the availability of adequate transport resources. The result is that the transportation system must often react to, rather than evolve with, DOD policy since it is not until national transportation policy is implemented that the specific needs of one sector relative to the other are actively considered. The intended objective should be to utilize the nation's transportation resources so as to meet the needs of both. However, the actual results may be quite different, as the following example will readily illustrate.

Design on the Army's new M1 tank was begun in 1973. The full production run called for 7,058 vehicles to be manufactured at a unit cost of $2.68 million. It was not until mid-1981 that the Army rigorously addressed the transport problems inherent in the movement of the 60 ton behemoth. The Pentagon noted that a standard rail car could only handle one M1, so the proposed solution was to build 569 stronger, more expensive flatcars that could accommodate 2 tanks each.[8] Similarly, air transportation is constrained in that the C5 wide-body airlifter can only carry one vehicle, effectively limiting the weapon's usefulness as a part of a short-notice deployment.

STRATEGIC AIRLIFT

The entire concept of strategic airlift (i.e. between the United States and overseas areas) was formulated with the start of World War II.[9] Since the military had little long-range air transport experience, the domestic airline community was pressed into service to fill the void. Though operating under the auspices of the Army's Air Transport Command and the Naval Air Transport Service, the carriers used their own equipment, facilities, and personnel to provide the capability for long-haul, rapid movement of men and equipment so desperately needed. In essence, the airlines themselves built and operated the wartime strategic airlift organizations. Following the war, the Air Force's Military Air Transport Service (MATS) became the permanent strategic air movement arm of the

United States military establishment. In 1965, MATS became the Military Airlift Command (MAC), which continues to perform as the single DOD manager for airlift. Strategic air movement is provided with an organic fleet of 96 C-5 wide-body aircraft, and 267 narrow-body C141s.[10]

To augment this capability in time of war or national emergency, the Civil Reserve Air Fleet (CRAF) Program was created in 1951, whereby civilian air carrier aircraft were identified by tail number and allocated for national defense at three levels of need which will be explained in detail later.[11] There was, and still is, no legislative basis for the CRAF; its success depends upon the cooperation of the airline industry.[12] To foster that spirit of voluntary participation, as well as to familiarize civil carriers with the handling of military passengers and cargo, MAC awards yearly contracts to CRAF participants for the provision of international air services. For Fiscal Year (FY) 89, $310 million worth of airlift will be provided for MAC by commercial carriers,[13] The CRAF as of August 1989 is depicted in Table 1. (It is worth noting that the exact size and composition of the CRAF fluctuates from month to month as carriers add and drop aircraft due to maintenance, sales, or equipment acquisitions.) By far the largest and most important portion of the CRAF is the Long-Range International Segment, consisting of 400 aircraft. This is the element that supports MAC strategic operations, and necessitates the use of aircraft capable of extended overwater operations with a productive payload.

Participation in the CRAF involves a commitment on the part of the carriers to respond to varying emergency situations incrementally, based on three levels of urgency. Stage I may be employed by the Commander-In-Chief of MAC (CINCMAC) to maintain cargo and passenger backlogs at MAC air bases within acceptable limits. Carriers have 24 hours to make an aircraft available for missions. Stage II includes those airplanes in Stage I, and is for expanded airlift, approved for use by the Secretary of Defense in providing capability for a contingency not warranting a declaration of national emer-

TABLE 1

CIVIL RESERVE AIR FLEET (CRAF)

Aircraft Allocated As of August 1989					
Domestic Segment (39)					
B727	8				
DC-9	3				
L-188	11				
L-100	17				
Alaskan Segment (7)					
L-100	3				
L-188	2				
DC-6	2				
Short-Range International Segment (30)					
B-737	4				
B-727	21				
B-757	5				
Long-Range International Segment (400)					
	Passenger (271)		Cargo (129)		
DC-8/B-707	20	+	51	=	71
B-747	109	+	52	=	161
DC-10	57	+	26	=	83
L-1011	38	+	0	=	38
B-767/A310	47	+	0	=	47

(Source: MAC HQ Form 312, Monthly Civil Reserve Air Fleet (CRAF) Capability Summary, 1 August 89

TABLE 2
CARRIERS PARTICIPATING IN THE CIVIL RESERVE AIR FLEET

As of August 1989

Domestic Segment
- Evergreen International
- Southern Air Transoport
- TPI International
- Zantop

Alaskan Segment
- Markair
- Northern Air Cargo
- Reeve

Short-Range International Segment
- Aloha
- Eastern
- Transocean
- Joint Venture 1: Key/American Trans Air

Long-Range International Segment
- American
- Continental
- Delta
- Hawaiian
- Northwest*
- Pan American
- Southern Air Transport*
- TWA
- United*

Joint Venture 1:
- Flying Tiger*
- Tower
- UPS*
- United

Joint Venture 2:
- World
- Rosenbalm*
- American
- Evergreen*
- Emery*

Joint Venture 3:
- Northwest*
- Federal Express

Joint Venture 4:
- Pan American
- Evergreen*
- Tower

Joint Venture 5:
- Pan American
- American
- Connie Kalitta*

Joint Venture 6:
- Pan American*
- American Trans Air
- Connie Kalitta*

Joint Venture 7:
- Rosenbalm*
- CF Air Freight*

*Airlines providing cargo aircraft
(Source: MAC HQ Form 312, Monthly Civil Reserve Air Fleet (CRAF) Capability Summary, 1 August 89

gency. As in Stage I, carriers have 24 hours to make an aircraft available. Stage III may be implemented by the Secretary of Defense, only after a national emergency is declared by the President or Congress. Carriers have 48 hours to respond to his call, which results in the commitment of all long-range cargo aircraft. Even though Stage III utilizes all CRAF line-haul resources, it is still not sufficient to meet wartime air cargo requirements, a shortcoming that will be discussed in more detail later.[14] Carriers participating in the CRAF as of August 1989 are shown in Table 2.

Presently, the U.S. wartime airlift requirement for military cargo is 66 million ton miles (MTM)/day, a figure that takes account of our sealift capability and - the prepositioning of equipment at various overseas locations. MAC organic aircraft (C-141/C-5) will provide 32.7 MTM/day capability, while the KC-10 (an aerial tanker/transport based on the commercial DC-10) will generate an additional 4.5 MTM/day of military airlift.[15] A Stage III CRAF activation would result in approximately 16 MTM/day capability, based on the CRAF composition in August 1989.[16] Thus, out of the 66 million ton miles/day that must be moved in wartime, the U.S. can, at best, hope to support only 53 million ton miles/day in the foreseeable future, leaving a 13 million ton miles/day shortfall.

The shortage of required airlift was discussed earlier. Of critical importance is the fact that this shortfall is exacerbated by a CRAF now subject to the vagaries of the free market. Deregulation of the airline industry led to a dramatic increase in air carrier competition. Coincidentally, costs (particularly for fuel) were rising while the nation's economy faltered and fewer people travelled by air. The airlines moved to adopt hub-and-spoke systems serviced by smaller aircraft; carriers like Pan Am, United, and American abandoned all-cargo service and sold off their freighter aircraft; new carriers entered the industry, squeezing profits still further and, in some cases, failing quickly. Complicating the situation for our international airlines was the fact that, while we had deregulated our commercial air industry, the rest of the world had not. Thus, U.S.

airlines faced the added burden of having to compete with overseas carriers owned or largely controlled by their respective governments, and, in many cases, operated for reasons other than profit. The result was a decade of upheaval in the air carrier industry that directly impacted the Long-Range International segment of the CRAF as well. The smaller airplanes being adopted by the carriers were not suitable for long-haul overwater transportation, and, in fact, were replacing older aircraft that could fulfill that mission. Braniff International went bankrupt in 1981; Flying Tigers came perilously close to following suit in 1986; and Pan American, after losing $72.7 million in 1988 (its 11th moneylosing year out of the past 17),[17] is now actively seeking some sort of merger partner.[18]

The 1980's saw other developments of importance to the CRAF. In 1983 the Air Force implemented the CRAF Enhancement Program whereby convertibility features could be retrofitted (at government expense) to existing passenger airplanes that would allow them to transport military cargo in time of war. Of the 19 B747s committed to the program, 15 have been modified as of late 1988.[19] Another DOD effort to address the declining number of long-range airliners in the CRAF took the form of a joint venture (JV) Program initiated by MAC in 1986. The intent of the program was to bolster the CRAF by bringing in operators and/or carriers previously excluded from participating. Should the need arise, aircraft and crews from the joint venture firms would be pooled and utilized as though they were being supplied by a single entity.[20] This enabled MAC to utilize the significant cargo fleets of companies such as UPS and Emery, something it had not been able to do before. Finally, growing concern about the increasing age of the airliner fleet led foreign and domestic carriers to embark on an unprecedented aircraft buying spree. Boeing received orders for 636 aircraft valued at $30.1 billion in 1988,[21] while McDonnell-Douglas logged $15.6 billion in firm backlogs for the year.[22] Of importance to this discussion is the fact that included in those figures were firm orders for 172 B747-400[23] and 103 MD-11 wide-body transports.[24]

However, whether or not the CRAF will benefit by these developments is uncertain. While the CRAF Enhancement Program resulted in the addition of valuable wartime cargo-carrying capability, Pan Am was the only carrier willing to participate. Thus, there is no ongoing stream of existing aircraft being modified; in fact, the B747 lost over Scotland in December of 1988 was a CRAF enhanced plane. The airline was contemplating putting twelve more aircraft through the program, but the revenue capacity eliminated as a result of the accident may necessitate postponement of that decision.[25] Another area of concern centers around the wartime management of the CRAF and its various component parts. A full-scale activation would involve coordinating the efforts of 29 airlines and eight joint ventures. Of the seven long-range international segment joint ventures shown earlier in Table 2, three are made up of three carriers each, while two more are comprised of four and five carriers respectively. Notification procedures alone would to be daunting; while the task of providing ongoing leadership in a contingency environment would appear to be virtually impossible. Finally, the growth in wide-body aircraft orders is a mixed blessing. For the first time in over a decade, U.S. airlines are committing to wide-body long range jets in appreciable numbers. American Airlines, for instance, recently ordered eight MD-11s and optioned 42 more,[26] while Delta ordered nine and optioned 31.[27] But these are all passenger versions that will provide no cargo carrying capability even if they do eventually find their way into the CRAF. Furthermore, tax law changes have combined with airline consolidations and mercurial market conditions to force a shift in transport aircraft purchasing and ownership patterns. Carriers are finding short-term leases (i.e. 5 years) an increasingly attractive alternative to ownership.[28] In fact, 30% of the U.S. commercial fleet is now leased, and that figure could increase to 60-70% in the next decade.[29] This gives the airlines tremendous flexibility to change aircraft types in response to competition and market opportunities, and eliminates the large capital costs associated with purchasing their own aircraft. However, one of the largest leasing companies in the world is GPA Group Ltd, which is an Irish firm.[30] This raises the specter of a further decline in

the CRAF, since foreign-owned aircraft are excluded from participating. In addition, the flexibility inherent in the leasing option will work against the fleet stability so essential to the CRAF. Programs like CRAF Enhancement are predicated upon maintaining the modified aircraft in the U.S. fleet for considerably longer than five years.

The preceding discussion has served to illustrate a crucial fact: the needs of the airlines no longer parallel those of national defense. This is not, necessarily bad. However, there is no mechanism in place to insure the maintenance of that industry/government linkage forged during, and after, World War II. Indeed, we can't even "draft" the carriers as we did then because their emphasis on smaller aircraft makes that proposition of limited value. Thus, it is that missing link that is the crux of the problem. The Airline Deregulation Act of 1978 makes essentially no mention of national defense, retaining the position underlying previous aviation legislation that a sound commercial air transport system would insure an adequate reserve of airlift capability in the event of war. Thus, it would be inaccurate to say that deregulation, in and of itself, placed the CRAF in jeopardy. Rather, the move away from economic regulation graphically illustrated that airline interests and defense transport interests may not, for whatever reason, coincide. The implication is, then, that in the absence of some mechanism to insure defense transport needs are met, managerial responses to future environmental developments (advanced aircraft technology, noise and pollution concerns, further market changes) could prove just as detrimental to wartime airlift capability as deregulation has today.

Unfortunately, policy makers have not handled this divergence very well. The perception is that the best way for the government to foster support for the CRAF is within the confines of the free market, as opposed to some sorts of more direct action that will delineated later. Thus, after ten years of trying to negotiate the CRAF Enhancement Program, the end result was the large-scale participation of only one carrier. Similarly, the almost inescapable conclusion is that the Joint Venture program would, if implemented, prove to be an

administrative and logistical nightmare. Finally, after almost four decades, airline participation in the CRAF is still voluntary. In sum, MAC and the DOD seem content to react to environmental changes after they occur, rather than pushing for a more proactive approach that does not rely solely on the vagaries of the free market.

PERIPHERAL ISSUES

It is important to realize that the use of civil air transport resources for military purposes is, at best, a compromise. The C141 and the C5 were specifically designed to carry cargo and are characterized by a high wing design; that is, the fuselage is suspended from the wing. This places the cargo compartment close to the ground, and provides the drive on/drive off capability so essential to the mass movement of wheeled equipment. The civilian air cargo industry on the other hand uses aircraft that are derivatives of passenger planes. The B747, the DC10, the B707 and the DC8 were not designed for freight transportation. They have a low wing design which places the fuselage above the wing, effectively eliminating any possibility for drive on/drive off vehicle handling. In addition, the two systems each utilize cargo pallets that are fundamentally different in design. Those used by the military measure 88 inches by 108 inches, while civilian pallets are either 88 or 96 inches by 125 inches.

Shipping military cargo aboard civil airliners presents some unique problems, even in peacetime. Military aircraft and materials handling equipment (MHE) are designed to handle DOD pallets widthwise (i.e. the long edge is perpendicular to the aircraft's line of flight). Narrow body airliners, as well as the DC10, are loaded from the side, which means the pallets must first be placed into the CRAF airplane, then manually spun 90 degrees before they are pushed down the fuselage. On those B747s designed for loading through the nose, the pallets must enter the aircraft lengthwise (i.e. the long edge parallel to the line of flight). Hence, they all must be turned 90 degrees before they are put onto the loader. When this is done,

military loading vehicles can carry only four pallets versus the five for which they are designed. It is worth noting here that, while military pallets can be transported on civilian airplanes, commercial pallets and containers are virtually unusable on military aircraft. The rail and locking systems aboard civilian aircraft can be adjusted to accommodate both types of pallets, while military planes can only accept Air Force pallets. Unfortunately, when airliners are used to transport military cargo, suboptimal aircraft utilization can result from the smaller size and reduced load bearing strength of DOD pallets relative to airline pallets

Another problem is that extremely large pieces of cargo, particularly rolling stock, are very difficult to handle via civilian aircraft. When utilizing sideloading planes, they payload has to be small enough and/or maneuverable enough to make the 90 degree turn from the loader into the fuselage. In addition, the narrow cabin of the DC8 or the B707 effectively limits the size and shape of the shipment, as does the nose opening in the wide body. Finally, the lack of a drive-in/drive-off capability proves to be a very limiting factor, especially in the context of a wartime scenario. Of equal concern is that military and civil loaders are basically restricted to servicing their respective aircraft. That is, Air Force loading vehicles were designed to handle aircraft having a cargo floor essentially at truckbed height above the ground. While this equipment can also service narrow-body airliners, it, cannot interface directly with wide-body Freighters. An elevator of commercial design must be utilized as a bridge between the aircraft and the loader; the plane simply cannot be worked without it. Similarly, civilian loading equipment is intended for use on aircraft having a cargo compartment that is ten to fifteen feet above the ground. The cab is generally designed to fit under the fuselage, something the low-slung military transport aircraft does not allow.

The inescapable conclusion is that military and civilian cargo handling systems are fundamentally incompatible. The two function together in peacetime because there is sufficient time to overcome

the constraints delineated earlier. But in a contingency situation those limitations could prove crippling. Essentially, military pallets and materials handling resources will be tasked to fulfill all wartime requirements because of the incompatibilities previously mentioned. Limitations on the type and size of cargo that can be moved aboard civilian aircraft would necessitate a horrendous scheduling effort intended to insure that aircraft and cargo are matched correctly. The commercial elevator required for wide-body loading/unloading is an obvious weakness since those aircraft cannot be serviced without it. Although MAC has prepositioned 116 of these elevators throughout the airlift system,[31] there is no guarantee that commercial cargo missions will be, or can be, limited to those fields having an elevator on station. Finally, the lack of a drive-on/drive-off capability severely limits the effectiveness of civil airliners in a contingency situation.

RECOMMENDATIONS

It is absolutely imperative that the nation's air transport resources become more responsive to the needs of national defense. One long range solution to the airlift problem would be for both MAC and the airlines to fly the same type of airplanes in the future. This could lower the per plane cost to each group, and would provide for a common cargo handling system while insuring a steady growth in usable CRAF capability. Of course, the introduction of the new C-17 widebody military transport (like the C-141 and C-5, also a high-wing design) in the mid 1990s will go a long way towards eliminating the airlift shortfall discussed earlier. But it will do nothing to address the deteriorating condition of the CRAF. Similarly, MAC has been working for years to put together a NATO "CRAF" comprised of suitable aircraft from nations belonging to that alliance, with little success. In truth, such a show of unity from countries of widely, disparate cultures and ideologies seems doubtful. Another, more immediate, alternative may be to capitalize on the renewed interest being shown by US airlines in wide-body planes, and CRAF

enhance all long range passenger aircraft before they come off the assembly line. This would keep modification costs down, and would provide a flow of contingency capability into the civil fleet. Admittedly, the carriers might have some reservations about the effect of the increased weight on aircraft's productive range, but the impact of this could perhaps be minimized through some sort of abbreviated enhancement package that would limit the wartime cargo payload slightly in exchange for reduced structural strengthening.

From the standpoint of military airlift alone, the first solution delineated above is the preferred one since it dramatically increases not only capacity, but much needed drive-on/drive-off capability. Unfortunately, the cost of this option is tremendous, and it does little to address the ongoing health of the CRAF. Rather, the third alternative seems the smarter choice. By enhancing new civil aircraft, increased contingency airlift can be obtained at a reasonable per-plane cost. While these airplanes could not provide drive-on/drive-off flexibility of their military counterparts, perhaps bulky vehicles and other large cargo could be earmarked for MAC. Alternatively, funds could be spent to develop loading equipment that would allow roll-on/roll-off loading and unloading of civil aircraft. At any rate, a continuous CRAF enhancement program sensitive to the revenue needs of the carriers, seems to offer the most promise for sustained CRAF growth.

CONCLUSIONS

Prior to 1978, the moods of the DOD tended to coincide nicely with those of the airlines. The latter wanted bigger, faster, longer-range aircraft, which was exactly what the former desired. The airlines could afford to buy those aircraft and were, by and large, perfectly willing to commit them to the CRAF. But while their collective enthusiasm for the CRAF remains just as strong today, the realities of the free market have made them less able to participate.

MAC approached one large US carrier several years ago, requesting that several new B747s be CRAF enhanced while still on the assembly line. The airline declined, citing range/payload penalties resulting from the weight of the modifications that would have rendered them less competitive over their long-haul routes. To put it bluntly, we simply do not have the means to rapidly transport the men and equipment needed to support DOD contingency plans. This, in turn, places the entire logistics effort at risk, a situation with grave implications for the nation's defense posture. Recall that the purpose of logistics is to create and sustain military forces to support national policy and objectives. Unless the relationship between the industrial providers and government users of air transportation is redefined to reflect the changing needs of both, America's strategic airlift capability will become a casualty of deregulation. The loss of such an important national resource must not be allowed to happen.

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