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AIR WAR COLLEGE

RESEARCH REPORT

STRATEGIC MOBILITY--IS EMPHASIS STILL NEEDED?

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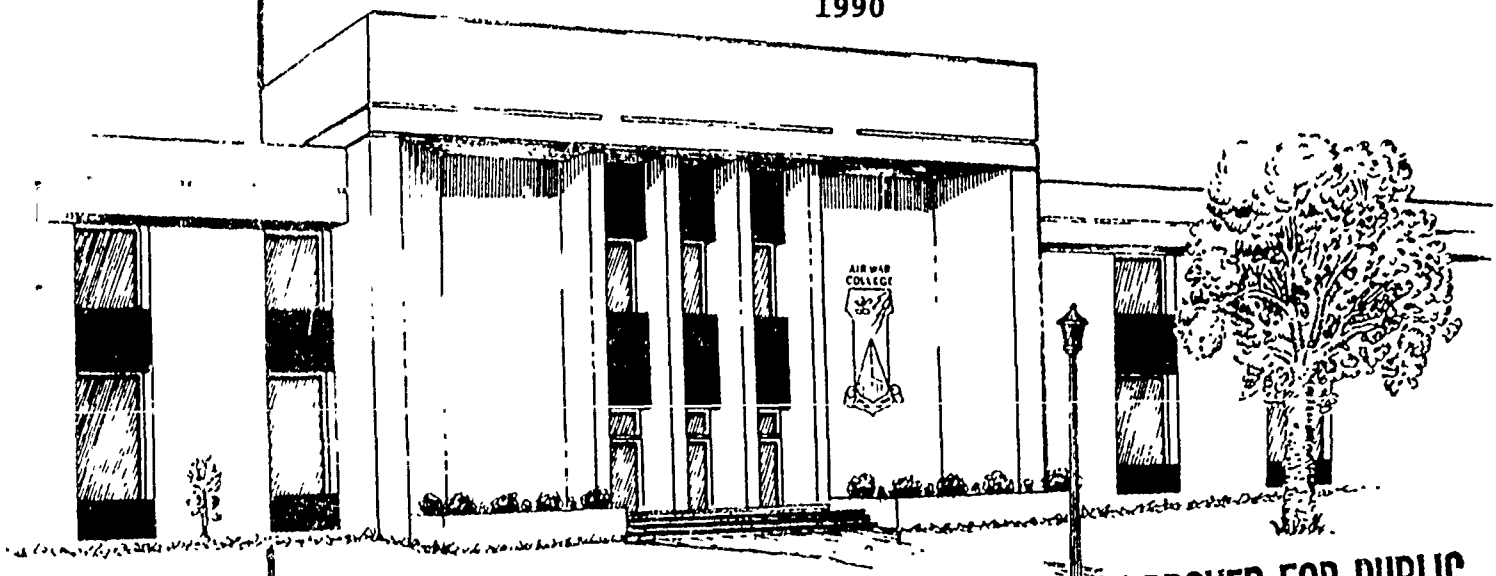

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STRATEGIC MOBILITY--IS EMPHASIS STILL NEEDED?

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EXECUTIVE SUMMARY

TITLE: Strategic Mobility--Is Emphasis Still Needed? AUTHORS: John W. Dalton, Lieutenant Colonel, USAF and Larry G. Radov, Lieutenant Colonel, USAF.

Our strategic mobility capabilities have been a widely debated and controversial issue--do we have enough lift capability to get what is needed, where it's needed, in time to make a difference? The military strategy of the US is critically dependent on our ability to rapidly deploy and sustain combat forces worldwide. The concept of deterrence is an important element of this military strategy. If it is to remain effective, potential enemies must not only recognize our readiness but also our ability to quickly project forces. We rely upon a strategic mobility triad (strategic airlift and sealift, and prepositioning) to accomplish this crucial task. This triad faces significant shortfalls in view of other current requirements. Will the changing global environment favor or worsen these mobility shortfalls?

This study, intended as a guide for the Joint Flag Officer Warfighting Course, includes synopses of selected journal articles and excerpts of other sources. It reviews the current state of our strategic mobility triad, its perceived future requirements, and how both may be affected by the changing international scene.

BIOGRAPHICAL SKETCH

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BIOGRAPHICAL SKETCH

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CHAPTER I

INTRODUCTION

The role of strategic mobility in any scenario leading up to and including warfighting is becoming more critical as we move into the multipolar world of the 1990s. The methods of waging war are based on generally accepted truths referred to as the principles of war. When applied in the context of the principles of war, strategic lift has been a key element in many successes across the spectrum of conflict.

The global military strategy of the US is based on the forward deployment of forces in peacetime and the forward positioning of equipment for CONUS-based, reinforcement forces. To implement this strategy the US must maintain the ability to rapidly deploy troops, equipment, and supplies to any worldwide location should our deterrent strategy fail.[1]

This study focuses on US strategic mobility capability. It examines the question, "Is emphasis still needed on projecting and sustaining military forces in the context of the changing international environment?" Recent world developments have signaled the possibility of east-west force reductions and increases in warning times for surprise attack. These developments, coupled with fiscal constraints and a widely

anticipated peace-dividend, are adding pressure on the elements of the US strategic mobility triad. This triad consists of airlift, sealift, and prepositioned forces.

The results of this investigation on strategic mobility are divided into three chapters. The remainder of this initial chapter looks in detail at the air, sea, and prepositioned elements of the strategic mobility triad. Chapter II provides synopses of articles on strategic mobility and associated areas that impact the subject now and will do so in the future. The final chapter analyzes the strengths and weaknesses in US strategic mobility and provides the rationale for continued emphasis. This analysis is done in light of the broad changes and challenges, many identified in the Chapter II articles, now facing the US.

Airlift Capabilities

The airlift leg of the strategic mobility triad is unique in that it offers speed and flexibility when projecting and sustaining personnel and material. In a prolonged conflict, airlift is limited because it can carry only 5 percent of the dry cargo required.[2] However, airlift is key, because it will move 100 percent of the requirements through day 15 of a conflict in the form of tactical fighter units and combat units.[3] Airlift assets must be ready to deploy this combat power early in a crisis to serve as a deterrent or actually to deploy a credible fighting force.[4]

The intertheater airlift capacity available in time of war is a combination of Air Force Military Airlift Command (MAC) operated aircraft and civilian assets mobilized through the Civil Reserve Airline Fleet (CRAF). As a result of a congressionally mandated mobility study (CMMS) in 1981, a fiscally constrained goal of 66 million ton-miles per day (MTM/D) of airlift was established. This goal was a significant increase over the 29 MTM/D that previously existed.[5]

Since the CMMS, slow progress has increased the US strategic airlift capability. MAC has stretched the C-141 and added an inflight air refueling capability. In addition, replacing the wings of the C-5A has extended its service life. The Air Force has also acquired 50 C-5B aircraft and 44 KC-10 aircraft. The 44 KC-10s complemented the 16 KC-10s previously purchased to increase air refueling capability. The C-5Bs and KC-10s provide additional outsized cargo capacity that the Army needs when deploying.[6] The delivery of the last C-5B in April 1989 brought the Air Force's strategic lift capability up to 49 MTM/D.[7] The acquisition of the C-17 will add capacity but, with program delays, the new aircraft will just offset the lost capacity from retiring C-141s.[8] The prospects of reaching the 66 MTM/D goal have been pushed into the next century.[9]

The CRAF currently provides 16 of the 49 MTM/D of available strategic airlift. This translates into 95 percent of the Department of Defense's passenger requirement and 20

percent of the cargo load.[10] Through the CRAF enhancement program, CRAF aircraft will provide 20 MTM/D of the nation's airlift goal by the year 2000. The CRAF enhancement program encourages airlines to add cargo convertability features to their wide-body passenger aircraft by DOD paying for the modification as well as increased operating costs.[11] The cost for these enhancements is about one-sixth the cost of military ownership.

The CRAF augments MAC during emergency situations. The aircraft are made available in three stages. Stage I is activated by CINCMAC during a committed expansion with up to 50 aircraft. Stage II is activated by the Secretary of Defense and includes 116 aircraft for use in an airlift emergency. Stage III, activated by the President, offers 400 aircraft for national emergencies.[12]

Sealift Capabilities

Sealift is the second component of the US strategic mobility triad. While airlift is an essential ingredient of mobility forces, sealift adds to the spectrum of cargo lift capability by providing diversification and mobility alternatives. The primary advantage of sealift is its payload capacity and ability to accommodate oversized military equipment unable to fit on airlift. This factor becomes increasingly important as the Army gets harder to move. Any major, long-term overseas deployment would require sealift to deliver about 95 percent of all dry cargo and about 99 percent

of all petroleum products.[13] For example, five cargo ships could carry the complete 101st Airborne (Air Assault) Division. To accomplish the same mission by air would require 1,600 C-5 and C-141 sorties. During the 1973 Yom Kippur War, one ship delivered more supplies than airlift had in the previous 19 days. However, the ship arrived after the ceasefire was signed.[14] Thus, sealift's primary limitation of speed must be considered by those planning force projection operations. But, sealift does provide the only viable means to maintain the flow of resupply material necessary to sustain forces in combat.

The US's strategic sealift comes from three major sources. The Navy's Military Sealift Command (MSC) operates a fleet of dry cargo ships and tankers. The US Maritime Administration maintains the National Defense Reserve Fleet (NDRF). Approximately 200 surplus cargo vessels placed in storage for recall in times of national mobilization make up the NDRF. The final and largest source of military sealift is US registered commercial ships, which consists of about 450 active, oceangoing vessels.[15] However, significant problems with the US maritime industry have resulted in a major shortage of national sealift capacity and it's getting worse.

First, many of the ships in the NDRF are World War II vintage Victory-class ships and require more than 60 days' notice for reactivation. Within the NDRF is a special Ready Reserve Force (RRF) component of 94 merchant ships with high military support capabilities. These RRF ships can be quickly

activated and deployed to loading berths on 5 to 20 days' notice. This RRF component is hardly an ideal solution though. To acquire, convert, and maintain these RRF vessels, which will sit idle until needed, costs the Navy approximately $150 million per year. This expense will increase as the RRF fleet is expanded.[16]

A second problem is a critical shortage of seafarers. A fleet of idle, government-owned ships does not sustain an active seafaring work force. A recent study predicts that as the RRF expands, a growing shortage of seafarers needed to crew the ships during mobilization will occur. A shortage of 8,000 seafarers in the US merchant marine is predicted by 1992.[17]

As stated earlier, the US registered commercial fleet is the largest source of military sealift and its capabilities have been deteriorating for decades. A 1,224-ship fleet maintained in 1950 has decreased to a 454-ship fleet in 1987. Our fleet is no longer competitive in the international market and now ranks eleventh in worldwide shipping.[18]

The shipbuilding and repair industry has also declined to an all time low that could probably not meet wartime needs. In 1980, 142 oceangoing commercial ships were being built in 19 shipyards. Currently, nine shipyards are still in business and no oceangoing commercial ships are under construction.[19]

To maintain the capability to deploy and sustain forces worldwide, we must address and solve the problems facing our

maritime industry. Resolution of these problems requires coordinated action between the government and private industry.

Prepositioned Materials

Prepositioning is the third leg of strategic mobility. The fact that it offsets airlift's limited capacity and sealift's slow delivery time makes it an essential part of the US forward defense strategy. Prepositioning, the storage of equipment and supplies in regions of the world where armed confrontation is most likely, is accomplished in several ways.[20]

One of the most recognized methods is the "prepositioning of material configured in unit sets" (POMCUS). These sets of equipment are currently located predominantly in Europe while their fighting units are stationed in the CONUS. The "maritime prepositioning ships" (MPS) programs is a concept of prepositioning Marine supplies aboard ships to support contingency operations. These 13 cargo vessels are controlled by the MSC and organized into three squadrons (one each in the Indian, Pacific, and Atlantic Oceans). Each squadron can support a Marine Amphibious Brigade of 16,600 personnel for 30 days. The Army, Navy, and Air Force also have "afloat prepositioning forces" (APF) which are controlled by the MSC. These 12 ships are located in the Mediterranean Sea and the Indian and Pacific Oceans.[21]

Prepositioning, like the other arms of strategic mobility, has its strengths and weaknesses. Its greatest

advantage is allowing forces into combat faster. Troops can be airlifted to join up with their equipment, thus avoiding the long delays associated with sealift. However, these stockpiles of war material are vulnerable to air attacks, ground attacks, and sabatoge during hostilities. The MPS and APF are vulnerable to submarines, mines, and are extremely vulnerable targets during extended off-loading at fixed port facilities.[22] Funding, storing, and maintaining these forward-based supplies is also a major detractor. In spite of these drawbacks, prepositioning has proven through realistic exercises that it works and serves as a deterrent.

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CHAPTER II

SYNOPSES AND ARTICLES

This chapter reviews the current literature on strategic mobility. The review focuses on articles that probe strategic mobility and closely associated areas. The articles address strategic lift's ability to react and meet a wide range of demands as well as its relevance in the context of the changing world. Eight articles were selected for this chapter. A synopsis of each article is followed by a copy of the article.

"Getting There" by Jeffrey Record. Paramaters 18, no. 2 (June 1988): 89-95.

- Thesis: US forces have a long-standing strategic mobility shortfall. Military forces count for little in wartime if they cannot be used when and where needed.

- Background

  -- The US is unique by having extensive and binding military obligations beyond its own continent, yet faces no military threat to its homeland requiring large military forces on its own territory.

  -- For the US, getting to the scene of action is, in most cases, as much a concern as fighting once there.

  -- Over 350,000 men, including four US Army divisions and 28 tactical fighter squadrons in Europe, are meeting the most demanding US commitment.

    --- Another 32 tactical fighter squadrons and seven divisions, including one Marine amphibious brigade, are retained in the US for rapid reinforcement of Europe.

      ---- Current US force planning goals call for delivery within 10 days.

      ---- Four divisions have equipment sets already stockpiled in Europe.

  -- For Korea and Japan, two divisions are deployed and two additional divisions are reserved in the US for Asian contingencies.

  -- The deployed European and Asian forces have advantages and disadvantages.

    --- The advantages are the forces have greater deterrent value and can respond more quickly requiring less strategic mobility.

    --- The disadvantages are the forces cannot be readily transferred to another theater, and they are vulnerable to terrorist attack.

- Present US Strategic Airlift Shortfall

  -- Current aggregate airlift capacity is 48.5 million ton-miles per day (MTM/D). This would increase to 66 MTM/D with the acquisition of the C-17.

-- The JCS have a requirement of 150 MTM/D for NATO's reinforcement and a need for a 98 MTM/D capability to support a regional conflict in Southwest Asia not directly involving Soviet forces.

- Present US Strategic Sealift Capability

  -- The Marine Corps has enough amphibious shipping to carry into an assault only one of its three assault trained divisions.

     --- This specialized shipping is scattered around the world.

- Reasons for Critical Strategic Lift Shortage

  -- Strategic mobility, particularly airlift, is very expensive.

  -- No service likes to spend procurement dollars on things designed primarily to help another service.

  -- Some federal lawmakers associate strategic lift with undesirable US military intervention in distant places and want to limit it.

  -- Army's inattention, at least until recently, to airlift considerations when designing weapons and equipment.

- Options for Reducing Critical Shortfall of US Lift Capabilities

  -- Cut force structure and apply the savings to production of additional cargo ships and military transport aircraft.

  -- Reduce the size and weight of Army forces slated for early deployment overseas by airlift.

     --- This improvement in strategic mobility comes at the price of tactical mobility or the ability to maneuver quickly and fight with heavy firepower.

  -- Increase reliance on sealift because of increased warning time concerning enemy actions.

  -- Eliminate strategic mobility's step-child status in the Pentagon and give it the status of a fifth independent service.

Lt Col Larry Radov, USAF
Irene Pearson-Morrow, ed

Getting There

JEFFREY RECORD

If the United States suffers a pronounced disparity between its overall military obligations and military power, it also suffers a no less significant shortfall in its ability to move what military power it does have to those places overseas which the United States is or may find itself committed to defend. Some have argued that there is little point in increasing US conventional forces until the long-standing strategic mobility shortfall is eliminated. Military forces, however robust, count for little in wartime if they cannot be brought to bear when and where needed.

Strategic mobility is the ability to move military forces in a timely fashion from one continent or theater of military operations to another. In practice, it involves moving forces across large expanses of water. Most continents are separated from one another by oceans, or, if joined by land, are connected by narrow, rugged, roadless, or otherwise difficult passageways to traverse in force. The German military proved incapable of crossing the English Channel (except by air) and found it difficult to sustain its power on the North African side of the Mediterranean Sea.

Even Europe and Asia, which share the same landmass, are connected by few road or rail lines of communication. In the Russo-Japanese War of 1904-1905, Russian ground forces in the Far East ultimately were defeated because the trans-Siberian railroad, unfinished in 1904 and still the only continuous land line of communication linking the Far East and European Russia, failed to provide adequate reinforcements and supplies to Russian forces fighting in Manchuria.

Strategic mobility is important to but a few countries. Most countries have no military commitments beyond their own borders, and of those that do, few have obligations beyond their own continents. The absence of intercontinental military responsibilities is reflected in lack of investment in means of strategic mobility, such as large, long-range transport aircraft and ships configured to haul military cargoes. Even the Soviet Union, notwithstanding its impressive investment in strategic mobility for the purpose primarily of projecting its military power beyond the Eurasian landmass, retains, as does the United States, a mainly Eurocentric military orientation. The difference, in terms of strategic mobility requirements, is that the

Soviet Union is part of Europe whereas 3000 miles of water separate the United States from Europe.

Among the world's military powers, including the Soviet Union, the United States is unique in that it has extensive and binding military obligations beyond its own continent, yet faces no military threats to its homeland warranting retention of large military forces on its own territory. Sizeable forces *are* kept at home in the United States, but primarily as a rotation base for overseas military deployments and as a reserve for overseas military operations. The same oceans that for over a century shielded the United States from external attack are today barriers to be surmounted in order to fulfill America's overseas military commitments as a world power. Given the magnitude of those commitments, it is a condition that imposes enormous requirements for strategic mobility, and no country has invested as much in strategic mobility as has the United States. For the US military, getting to the scene of action is in most cases as much a concern as fighting once there.

To meet its commitments, the United States deploys overseas, ashore or afloat, a major portion of its standing military forces. In Europe, the most demanding of all its defense commitments, the United States stations over 350,000 men, including four US Army divisions. Another seven divisions, including one Marine Corps division, are retained in the United States but earmarked for Europe's rapid reinforcement in the event of crisis or war; four of these home-based divisions have extra sets of equipment already stockpiled in Europe. In Northeast Asia (Korea and Japan), the defense of which is second in importance only to that of Europe, two US divisions (one Army and one Marine) are deployed, and two additional divisions, one in Hawaii and one in California, are earmarked for Asian contingencies.

Europe and Northeast Asia account for the lion's share of those US ground and tactical air forces deployed overseas. But US military forces are for the most part not deployed ashore in those countries which the United States is committed to defend. US military commitments fall into two categories. In the first are what may be termed *prepositioned commitments*, or those commitments, such as in Europe, Korea, and Japan, where the United States enjoys politically secure military access ashore in peacetime and where US forces are already deployed. In contrast are *non-prepositioned commitments*, or those in which the United States, for political or other reasons, is denied or chooses to deny itself the advantages of stationing forces on the spot.

Most US overseas commitments are of the latter variety and are located mainly in the Third World, where even the most friendly local governments are often unwilling to accept the presence of US military forces on their territory for fear of compromising their own domestic political legitimacy. This unwillingness is especially pronounced in Southwest Asia, widely regarded as the most logistically demanding of all potential theaters. Central America is another region where, with the exception of the Panama Canal Zone, the United States cannot—or chooses not to—deploy ground combat and tactical air forces ashore on a permanent basis.

Prepositioned commitments have obvious advantages over non-prepositioned ones: forces in place have greater deterrent value, can respond more quickly to hostilities, and by definition require less strategic mobility than do non-prepositioned forces. On the other hand, prepositioned forces have two distinct

disadvantages. Precisely because they serve in part to underline the credibility of the US commitment to those countries where they are deployed, they cannot readily be transferred to another theater of operations without undermining the confidence of host governments. Second, prepositioned forces, far more so than forces deployed at home or afloat, are vulnerable to local terrorist or other forms of unconventional attack. The first US ground combat forces transferred to Vietnam were sent there not to defend South Vietnam, but to protect US air bases in that country that were being subjected to guerrilla attacks. The 1983 truck-bombing of the US Marine Corps headquarters in Beirut, Lebanon, demonstrated that in some areas of the world, prepositioning of US forces ashore can actually invite rather than deter violence and is therefore to be avoided.

US strategic mobility requirements, however, would be enormous even if the United States had no military obligations in the Third World. Mobility requirements for Europe's defense alone exceed those of any other single force-planning contingency. Although four US divisions and 28 tactical fighter squadrons are already prepositioned in Europe, the United States is committed to a massive reinforcement of Europe in the event of crisis or war. Current US force planning goals call for delivery *within 10 days* from the United States of an additional six Army divisions, 60 Air Force tactical fighter squadrons, and one Marine amphibious brigade—all with initial combat and combat service support. To place the magnitude of this reinforcement requirement in historical perspective, it is enough to say that it far exceeds, in terms of the amount of military forces to be moved over intercontinental distances, any American or Anglo-American operation of World War II, the largest of which were the allied landings in North Africa in November 1942 (Operation Torch), which entailed the direct movement from the United States and Great Britain of 107,000 troops.

It is also important to recognize that US strategic mobility capabilities have been, and will continue to be, indispensable to the performance of key missions other than moving US forces to areas of crisis or war. In the past, those missions have included resupply of beleaguered allies (e.g. the massive US airlift to Israel during the October War of 1973); movement of allied forces (e.g. the airlift of French and Belgian forces into Zaire in 1978); and famine/disaster relief operations (e.g. the Ethiopian airlift of 1984).

However, notwithstanding the indispensability of both airlift and sealift to the ability of the United States to meet its extensive obligations overseas, the United States has never, in peacetime or in wartime, maintained the lift necessary to meet its lift requirements. US and Anglo-American operations in World War II were severely constrained by chronic shortfalls in sealift and airlift. The great allied airborne drops in southern and central Holland in September 1944 failed to secure a bridgehead across the Rhine in part because there were not enough transport planes to deliver the three-division assault force simultaneously; the drops were spread over three days, thus dissipating the initial advantage of surprise. Even the timing of the Normandy invasion was dictated by a shortage in shipping. As Dwight D. Eisenhower later recounted in his *Crusade in Europe*,

> [Landing craft] production limitations alone ruled out any possibility of a full-scale invasion in 1942 or . . . 1943. Indeed, it soon became clear that unless

practically all American and British shipping could be concentrated on the single purpose of supporting the invasion of Europe that operation could not take place until early 1944.[1]

Sealift and airlift shortfalls persisted throughout the postwar era, as US military commitments overseas expanded and as lift capabilities inherited from World War II were retired. In the mid-1960s, Secretary of Defense Robert McNamara asked the Congress to authorize major increases in strategic airlift and sealift, most of which were forthcoming. During the next 15 years, however, no major new strategic lift programs were undertaken; and although the Reagan Administration has acquired some new fast ships configured for military lift and has endorsed a US Air Force Airlift Master Plan aimed at doubling US strategic airlift capabilities, the United States continues to suffer a major shortfall in strategic mobility, especially airlift, which is indispensable in circumstances in which surface (land or sea) lines of communication are unavailable, inadequate, or denied; in which delivery of forces must be accomplished quickly, at speeds exceeding that of surface transportation; or in which forces and supplies must be delivered deep inland.

The airlift shortfall is huge. Both airlift capabilities and requirements are for planning purposes measured in terms of million-ton-miles per day (MTM/D)—that is, in multiples of the capacity to move one ton of cargo by air a distance of one mile in one day. Thus an airlifter capable of moving 100 tons of cargo 3000 miles in one day would have a lift capacity of 0.3 MTM/D (100 x 3000 x 0.000001/1). This standard of measurement does not, of course, take into account such real-world constraints as exhaustion of aircraft and crews, inclement weather, availability of airfields, overflight rights, and possible enemy action.

The present US strategic airlift fleet of over 350 C-5s, C-141s, and KC-10s (along with selected commercial aircraft specially configured to handle military cargoes) currently has an aggregate lift capacity of about 40 MTM/D. The Reagan Administration airlift enhancement programs now underway will raise this figure to 48.5 MTM/D by this year, assuming, of course, that none of the programs falls victim to defense budget cuts. Beyond 1988, the Air Force plans to introduce a new transport—the C-17—that will increase aggregate airlift capability to 66 MTM/D, a target figure established in 1980 by a congressionally mandated mobility study performed by the Pentagon. The Joint Chiefs of Staff, however, have specified a requirement of 150 MTM/D for NATO's reinforcement alone; even a regional conflict in Southwest Asia that did not directly involve Soviet forces would consume an estimated 98 MTM/D, or more than twice the capacity now on hand and half again as much as that even planned by the end of the century. Shortfalls in sealift, especially in amphibious shipping, are no less acute. The US Marine Corps has amphibious shipping sufficient to carry into an assault only about one of its three amphibious assault-trained divisions, and this specialized shipping is scattered around the world.

The question might well be asked why the United States has continued to permit such a large debit in so critical a category of military power. There are a number of reasons. First, strategic mobility, particularly airlift, is very expensive. For example, the C-17 the Air Force plans to buy in the 1990s already has an estimated price tag of $178 million a copy, a figure that, if history is any guide, is likely to rise as the plane moves toward actual production.

Second, and perhaps most important of all, strategic lift has always been a bureaucratic stepchild within the Pentagon. No armed service, including the Air Force, which operates the US Military Airlift Command, likes to spend precious procurement dollars on things designed primarily to help another service—in this case the Army—accomplish its mission. Most senior Air Force officers would rather spend money on warplanes than on slow, unglamorous transports designed primarily to haul Army forces around the world. Likewise, the Navy traditionally has lacked enthusiasm for all but minimal investment in amphibious shipping, which is vital to the Marine Corps' prosecution of its principal mission. It is no coincidence that the Army and the Marine Corps, the two services most dependent upon strategic lift, are the two services most supportive of strategic lift enhancement programs.

A third reason for the continued neglect of strategic lift is its association in the minds of many, including some federal lawmakers, with undesirable military intervention in distant places where the United States lacks or is perceived to lack security interests worth fighting for. The late Senator Richard B. Russell opposed McNamara's request for more sealift on the eve of US military intervention in Vietnam on the grounds, in Russell's words, that "if it is easy for us to go anywhere and do anything, we will always be going somewhere and doing something."[1]

A fourth and seemingly insignificant, but in reality quite important reason for the persistent shortfall in US strategic airlift capabilities has been the Army's inattention, at least until recently, to airlift considerations when designing its weapons and equipment. For example, when the Army modernized its jeeps in the 1960s, it failed to recognize that the addition of a mere two inches to the vehicles' widths meant that they could no longer be double-parked inside the C-141, which is still the mainstay of the strategic airlift fleet. This effectively doubled the number of C-141s required to move a given number of the new jeeps overseas. Insensitivity to air transportability continued through the following decade, a notable example being the introduction of the Bradley Infantry Fighting Vehicle which, unlike the M-113 armored personnel carrier it replaces, requires partial and time-consuming disassembly to be fitted inside a C-141. To its credit, the Army today is paying far more attention to air transportability considerations. New force structures and equipment specifically tailored for rapid movement by air are being devised, and regulations are now being written that would give the Military Traffic Management Command a vote on the Army's Systems Acquisition Review Council, which reviews Army weapons and equipment developments.

But far more must be done if the critical shortfall in US lift capabilities is to be eliminated. Unless US force planners are expecting an invasion from Canada or Mexico, it makes little sense to create and keep costly ground forces in the United States that cannot be moved overseas when and where they are needed. The most obvious solution would of course be to increase sealift and airlift capabilities to satisfactory levels. This solution, however, would be prohibitively expensive; indeed, it is unlikely that even planned sealift and airlift capabilities, which fall far short of actual requirements, will be fully funded in the current and foreseeable defense budgetary environment. On the other hand, money for more strategic mobility could be obtained simply by cutting force structures and applying the savings to production of additional cargo ships and military transport aircraft—an

idea that has been proposed by a number of experts although the services themselves, for whom strategic lift has never been the highest priority, vigorously oppose it.

A second solution would be to reduce the size and weight of Army forces slated for early deployment overseas by air, an option the Army is now vigorously pursuing. The Army is creating several new light infantry divisions designed specifically to accommodate the longstanding shortfalls in strategic airlift. These new 10,000-man divisions have been stripped of all tracked vehicles, including tanks, armored personnel carriers, and self-propelled artillery, as well as many of the combat and combat service support units normally found in a standard infantry division.

The kind of strategic mobility achieved by the Army's new light divisions, however, comes at a stiff price. There is an inherent antagonism between strategic mobility (getting to the scene of hostilities on time) and tactical mobility (being able, once on the battlefield, to move around quickly and fight on it); the very qualities that afford the light divisions high strategic mobility—their limited firepower and lack of mechanized means of moving around the battlefield—have led some experts to conclude that the divisions are "too light to fight" against all but largely foot-mobile, unmechanized opponents—that the light divisions would stand little chance against the armor and mechanized infantry of the Soviet Union or of Soviet client armies in, say, Southwest Asia. Though the Army has responded to this criticism by asserting that it does not intend to deploy light infantry forces in such conditions unless they are accompanied by sufficient heavy forces, the latter, precisely because they lack the strategic mobility of light forces, cannot be rapidly deployed by air. Thus, in circumstances requiring both light and heavy forces, force planners could be faced with an unenviable dilemma: send the light forces ahead by air and hope they will be able to hang on until the heavy forces coming by sea arrive; or withhold deployment of light forces until heavy forces can be brought to bear, thereby risking defeat owing to the failure to get any forces to the disputed ground first. This is not to argue against the creation of the kind of air transportable ground forces the Army is now devising; it is simply to recognize that the new light divisions have not succeeded in eliminating the inherent cost of maximizing strategic mobility in terms of severely reduced tactical mobility and firepower.

Another approach to reducing the strategic lift shortfall—or at least reducing the lift's cost—would be to increase reliance on sealift and decrease dependence on airlift. Sealift, though slower than airlift, is much cheaper and can move infinitely greater forces. This solution, however, would be predicated on alterations in present force-planning assumptions underlying stated airlift requirements. For example, planned airlift capabilities are based in large measure on the assumption that a crisis or war in either Europe or Southwest Asia could erupt with little effective warning, thereby placing a premium on a heavy investment in airlift and (where possible) prepositioning. Many observers, however, believe that a war in Europe almost certainly would be attended by sufficient warning to permit the movement by sea of many US reinforcement units now slated to go by air. Though force planning assumptions ought not be tampered with simply to save money, all deserve constant review of their validity in a constantly changing military environment.

A fourth measure that warrants serious examination would be to confer upon strategic mobility a bureaucratic constituency and clout within the Pentagon that would eliminate its present step-child status and render it a formidable competitor for service procurement dollars. The unique importance of strategic mobility to the US military is not reflected in the Pentagon, where it continues to take a back seat to other procurement programs and where responsibility for it is parcelled out mainly between the Air Force and the Navy. A case can be made for concentrating all present strategic mobility responsibilities and commands, including the Air Force's Military Airlift Command, the Navy's Military Sealift Command, and the task for providing amphibious shipping to the Marine Corps, in a single new organization and conferring upon that new organization the status of a fifth, independent service. A promising step in that direction was taken in 1987 with the formation of the United States Transportation Command, although the fledgling USTRANSCOM falls far short of what might be required. To be sure, some of the Pentagon's existing military departments would vigorously oppose establishment of a Department of Strategic Mobility because it would deprive them of roles and missions for which they now have responsibility. But the Pentagon as it is currently organized has failed to fulfill its strategic mobility responsibilities in a manner that would ensure a reasonable relationship between capabilities and requirements. The parochial, bureaucratic interests of no service ought to be allowed to take precedence over the nation's broader military interests.

NOTES

1. Dwight D. Eisenhower, *Crusade in Europe* (New York: Doubleday, 1948), p. 185.
2. In Henry L. Trewhitt's *McNamara* (New York: Harper and Row, 1971), p. 159.

—*Jeffrey Record, senior research fellow at the Hudson Institute, adjunct professor of military history at Georgetown University, and military affairs commentator for* The Baltimore Sun, *is the author of* Revising U.S. Military Strategy *(Pergamon-Brassey's, 1984) and* Beyond Military Reform: American Defense Dilemmas *(Pergamon-Brassey's, 1988). The present article is taken from Chapter 3 of the latter work, which will be reviewed in the September 1988 issue of* Parameters.

"Cassidy Urges Growth for Merchant Marine' by General Duane H. Cassidy. Translog 3, No. 6 (July 1989): 1-4.

- Thesis: The declining US maritime industry must be reversed to ensure adequate sealift resources to meet national economic and security needs.

- Background

  -- The president's Commission on the Merchant Marine and Defense noted the maritime industry's current deteriorating condition.

     --- The commission projected a shortfall of 140 ships and 12,000 seamen by the year 2000.

  -- Every indicator shows a declining trend.

     --- In 1970 there were 18 major shipping companies, now there are four.

     --- In 1970 905 ships were in service, now only 424.

     --- In 1980, 142 oceangoing ships were being built in 19 shipyards.

     --- Now nine shipyards are in business and no oceangoing commercial ships are under construction.

     --- Our merchant ships carry only four percent of our international waterborne commerce.

- History of the US Merchant Marine in National Defense Role

  -- The US Merchant Marine is the fourth arm of our defense--the logistics lifeline to troops overseas.

  -- Merchant mariners served in every conflict.

     --- During World War II merchant marines lost more than 700 ships with more than 5,600 mariners killed or missing.

     --- 609 were prisoners of war.

- Challenges and Opportunities in the 1990s

  -- One consultant predicts ship owners will need 38.5 million gross registered tons of new merchant ships between 1991 and 1995. That demand jumps to 132 million gross registered tons in the late 90s.

-- Other sources predict steady growth in international commerce and finance of about two percent a year, through the year 2000.

-- The US maritime industry must make preparations to compete for shipbuilding orders and commerce carrying in this arena.

- Necessary Actions for a Viable Maritime Industry

-- The new National Sealift Policy is essential to provide guidelines and stimulate action by all agencies involved.

-- Research and development is the cornerstone of our recovery effort. Government and industry must work together to ensure US shipbuilders can compete in the world market.

-- Increased military spending to place more ships in Ready Reserve Forces (ships placed in reserve for use during national emergencies) is not the answer.

--- This expensive approach will not overcome the rapidly vanishing cargo capability in the US Flag Fleet.

--- Enough crews will not exist to man the idle reserve fleet in case of emergency.

-- We must take action now to ensure we have adequate sealift resources to meet national economic and security needs.

Lt Col John Dalton, USAF
Irene Pearson Morrow, ed.

Cassidy urges growth for Merchant Marine

The following article is excerpted from remarks delivered by Gen. Duane H. Cassidy, commander, U.S. Transportation Command, to the Maritime Day Luncheon at the Washington Naval Yard Officers Club in Washington D.C. on May 23, 1989.

One-hundred and seventy years ago, a steamer left Savannah, Ga., on its first trans-Atlantic crossing. The date was May 22, 1819.

Named for that port city, the Savannah was the first American-built steamer to cross the Atlantic, and that crossing signaled America's determination to become a real seagoing nation.

It is the anniversary of that crossing that we celebrate each year as National Maritime Day—commemorating the many contributions, by the people in the maritime industry, to our nation's growth and development.

I suppose there *are* some who think that our time as a seagoing nation has come to an end. To those I would respond, "If you don't think the United States is still a seagoing nation, how do you explain the way we keep finding ourselves in deep water."

Seriously, just as that first trans-Atlantic steamer began a new era of international trade and economic growth, I believe that we are about to enter an equally revolutionary chapter of maritime history; because we are seeing for the first time a determined coalition of people who believe, as I do, that the maritime industry can *not* be forgotten, and *must not* remain a declining industry.

I don't need to educate *this* audience on the current state of maritime affairs. You have all followed the progress reports and recommendations of the President's Commission on the Merchant Marine and Defense, which called the current deteriorating condition a "clear and growing danger to national security," and projected a shortfall of 140 ships and 12,000 seamen by the year 2000.

You know that virtually every indicator shows a declining trend. In 1970, there were 18 major shipping companies—now there are four. In 1970, there were 905 ships in service—now only 424.

As recently as 1980, 142 oceangoing ships were being built in 19 different shipyards. Today, only nine are still in business, and there are *no* oceangoing commercial ships under construction at all—*NONE!!!*

We realize that the situation is serious—no—critical.

The question, as Adm. Trost recently asked, is whether or not "this country will lose our identity as a maritime nation ... and become, in effect, an economic colony to be exploited by other nations."

There is something drastically wrong when the merchant ships of the greatest trading nation in the world carry 4 percent of our international waterborne commerce. That means there are many busy ports in the United States with no U.S. Flag ships in them. America should not only be the greatest trading nation in the world, but should once again become a great maritime power.

"There is something drastically wrong when the merchant ships of the greatest nation in the world carry 4 percent of our international waterborne commerce."

Fortunately, people like you and I are starting to get our message across to those who do not share our proximity to the problem. One of the best ways to begin is to create an awareness of our heritage as a maritime nation. Today's activities are a great example of what can be done.

History clearly demonstrates that the U.S. Merchant Marine is the fourth arm of defense—the logistics lifeline to our troops overseas. Records show that Merchant Mariners have served in every conflict They have served with bravery and distinction, alongside their uniformed counterparts.

During World War II alone, we lost more than 700 ships—more than 5,600 mariners killed or missing, and thousands of others injured.

Most Americans don't know that 609 merchant seamen were prisoners of war, or that the Merchant Marine fatality rate was second only to that suffered by the U.S. Marine Corps.

The merchant seamen of this country are great people—great Americans. They come from all over the country, and they serve under the American flag all over the world.

I've been to the Seafarers Harry Lundeberg School of Seamanship in Piney Point, Md. I've seen the honor roll of mariners who died serving their country, and that story needs to be told.

However, the problem is not one that will be solved by rhetoric alone. It calls for action.

For many months, you have been hearing and reading about a new National Sealift Policy—the essential first step in redressing the maritime dilemma. The Secretary of Defense signed a memorandum last month (Apr. 27) giving the proposed policy his full support, and has forwarded it to the National Security Council for final coordination.

Once President Bush signs it, we will have both the framework of policy guidelines and the catalyst to stimulate action by all of the agencies involved.

Obviously, the problem is beyond the ability of the DOD to resolve, and will clearly require the cooperation and attention of many other players. But a National Sealift Policy will chart the course for the return of a healthy maritime indus-

try to meet our military and economic support sealift requirements.

We have a great challenge before us, and a great opportunity.

This may be the right moment in time for recovery. We're beginning to see reports forecasting increased demand for new shipping in the nineties. One British consultant predicts that ship owners will need 38.6 million gross registered tons of new merchant ships between 1991 and 1995, and that demand jumps to 132 million gross registered tons in the late nineties.

I'm not naive enough to believe every prediction I read, but there are also similarly positive predictions from other sources about increasing world trade figures, and talk of a steady growth in international commerce and finance of about 2 percent a year, through the year 2000.

Certainly, many major industries are preparing now to take advantage of these positive trends. Why can't the United States Maritime Industry get a share of that? Can you imagine the impact if U.S. companies could get 10 percent of these shipbuilding orders, and U.S. Flag shipping could carry 20 percent of that commerce?

But to do that, we will have to fall back on something uniquely American—our innovative application of technology to get practical results. We call it Yankee ingenuity.

America has always been in the forefront of maritime innovation. The roll-on/roll-off concept, the container ship and Electronic Data Interchange are American ideas that have changed the shipping industry around the world.

Investments now in sealift technology, new ship design and new propulsion systems could put us in the lead once again, and result in a natural solution for our shipbuilding industry.

Research and development is the cornerstone of our recovery effort, but government and industry must also work together now to ensure United States shipbuilders are kept alive and will be able to compete in the world market. Or, as my DCINC says, "We need to get our oars in the water if we intend to stay in the race."

My view is that, because the nature of the world market is changing so rapidly, the policies and systems that have governed the relationship between government and the maritime industry for the last 50 years may need to be laid aside. Not that we're wrong, but we can't afford to let this industry get stuck in time. We must be willing to rethink the issue, and make way for new policies and new systems that will refit the industry for the next century.

If we *can* get our act together in time, America will have the right product, at the right time, to meet the economic trading needs of the future.

"We can't afford to let this industry get stuck in time."

On the military side of the coin, I want to acknowledge the action taken in the last few years to enhance our organic sealift capability.

Since 1980, the Navy has spent $7 billion to improve strategic sealift. Additional modernization efforts are underway to improve the military utility of existing commercial vessels, such as seasheds, flatracks, improved cargo discharge systems and logistics over-the-shore operations—all of which will make us better able to support our combat forces.

But these programs are not designed to be a final solution, and they cannot overcome the rapidly vanishing cargo capability in the U.S. Flag Fleet. It certainly makes more sense for this country to have a viable merchant marine than to park growing numbers of ships in large marine parking lots, with no crews to man them.

I said earlier that this is the right moment in time for a recovery. I'm confident there are definite opportunities just around the corner.

But there is another reason. Over the last two years, I have been honored to meet with and learn from all the players involved with maritime issues, and all those players have agreed to come together to work out a solution in a unified way. The time is right to put the pieces of the maritime industry puzzle back together again.

All of the government organizations that can impact on this industry—The National Security Council, the Department of Transportation, the Department of Commerce, the Department of State, as well as the Department of Defense—should work together to restore the health of the maritime industry of our country.

Within the Congress, I have talked with many members who understand the critical need to support this industry, and they are ready to come together for action.

I have met with the union leadership, whose input is vital to the solution. After all, they are the ones who provide the skilled mariners and the shipyard workers to this equation. They find them, recruit them, train them, and place them in the industry

"It certainly makes more sense for this country to have a viable merchant marine then to park growing numbers of ships on large marine parking lots, with no crews to man them."

I get the same commitment to cooperation from industry leadership, along with strong grassroots support from organizations like the Maritime Academies Alumni associations, the National Defense Transportation Association with its sealift committee, the Navy League,

and, of course, the Propeller Club.

All these groups are ready now to work together on the tasks before us.

Now is the right moment in time to coordinate our actions, focus our abilities, and work together to bring strength back to the maritime industry—an effort that will ensure that we have adequate sealift resources to meet national economic and security needs.

That doesn't mean that we won't disagree from time to time; we all know that healthy discussion brings better decisions. But if all these people, with all this talent, are headed in the same direction—and stay committed to the long haul—we will ultimately succeed.

And, in years to come, we will look back to National Maritime Day, 1989, as the moment in time when our recovery efforts began.

"Facing Up to America's Strategic Sealift Shortfall" by Allan W. Cameron. Armed Forces Journal International (July 1989): 70-75

- Thesis: The US shortage of strategic sealift has become critical. We no longer have the maritime capability -- ships, men to man them, and shipyards to build and repair them-- to support our national strategy of forward deployment overseas.

- Background

  -- The maritime capability problem has been developing for several decades. Defense leaders and Congress noted the problem in the 1980s.

  -- Under the Reagan Administration, more than $7 billion was invested in sealift assets.

  -- The situation worsened with declining numbers of oceangoing commercial ships-- from 2,114 in 1947, to 543 in 1980, and 369 in 1987.

- Commission on "Merchant Marine and Defense" Established

  -- The Reagan administration and other agencies opposed the creation of such a commission because it might require a change in funding priorities.

  -- DOD viewed adequate sealift as critical, but was not willing to fund it at the expense of tanks, planes, or combatant ships.

  -- The first commission report in October 1987 found "a clear and growing danger to the national security in the deteriorating condition of our maritime industries."

  -- According to the commission, all possible solutions required additional federal funds.

- Startling Commission Conclusions

  -- The US did not have enough ships for a major deployment in a contingency operation in a single distant theater such as Southwest Asia.

     --- Prior to the report, officials presumed that the US could not itself meet all the strategic sealift requirements for a NATO or global war, but did have the resources needed for a single-theater conventional conflict.

     --- The analysis was conducted under "best case" assumptions leaving out questions

concerning ship availability, port availability, attrition, and weather.

--- Other critical assumptions made by defense planners and incorporated in the commission's analysis included the following:

---- All needed US flag ships could be obtained within a relatively short time.

---- DOD could rely on all the military useful ships in the "Effective United States Controlled" (EUSC) fleet (ships owned by US nationals but registered under foreign flags and manned by foreign crews for economic advantages).

---- European allies would provide ships to support US forces for a reinforcement of NATO.

-- Insufficient manpower reserves exist to man ships in our Ready Reserve Fleet (RRF) and National Defense Reserve Fleet (NDRF). Many of these are "mothballed" ships to be made available when necessary.

--- As the size of our commercial fleet shrinks, so does the pool of qualified seaman needed to man our reserve fleets during a national emergency.

--- If current trends continue, the shortfall will be more than 12,000 personnel by the year 2000.

-- The 1987 report included no firm estimates on effects of attrition by defense planners during strategic mobility planning. However, the 1988 analysis showed the following:

--- When the commission introduced low to moderate attrition rates, delivery shortfalls increased by as much as 50 per cent.

--- Experience in the Falkland Islands and the Persian Gulf suggests even low-intensity conflicts can produce significant merchant ship attrition.

-- Changing characteristics of commercial merchant fleets worldwide may give the ships greater commercial capability but tend to make them less useful for military purposes.

-- The US's ability to build new ships has deteriorated. American shipyards can't compete in terms of price and efficiency with foreign yards.

--- Currently, no oceangoing merchant ships are under construction in the US. The industry is almost entirely dependent upon a shrinking volume of government business.

- Prospects for Improving the Maritime Industry and Strategic Sealift Capabilities

  -- Reaction to the commission's report by both the executive branch and Congress was mild, with the maritime industries indicating mixed views.

  -- This national problem requires coordinated action from the government and private industry; DOD resources alone are insufficient.

  -- To maintain the capability to deploy and sustain our forces worldwide, the US must act now to reverse the trend of its deteriorating maritime industry and resulting inadequate strategic sealift capabilities.

Lt Col John Dalton, USAF
Irene Pearson-Morrow, ed.

Facing Up to America's Strategic Sealift Shortfall

by Allan W. Cameron

Shipbuilding in this country, and also the capacity of our merchant marine, . . . is dismal. It is a disaster. The maritime industry . . . needs an infusion. It needs help. It needs resurrecting. . . . It is a national problem.

Admiral William J. Crowe, USN
Chairman of the Joint Chiefs of Staff

Admiral Crowe's frank and spontaneous comment in Congressional testimony April 25th is the most recent reflection of a growing realization that the US no longer has the maritime capability—ships, men to man them, and shipyards to build and repair them—necessary to support its national strategy of forward deployment overseas.

Virtually every military Service chief and unified commander has expressed public concern about the shortage of sealift. USAF General Duane H. Cassidy, Commander-in-Chief, US Transportation Command, sees it as perhaps his most important and difficult challenge. Nor is there much remaining illusion that the government can provide the necessary resources by itself. As General John R. Galvin, the Supreme Allied Commander, Europe, told *AFJI* in April, "The answer is to revive the merchant marine."

Secretary of Defense Richard B. Cheney described sealift as a "critical issue" in an April 27th memorandum to the President's national security advisor, Brent Scowcroft, saying, "Early action is necessary to develop a policy to coordinate the actions of the many departments and agencies involved in regulating and promoting our maritime industries."

The shortage of strategic sealift is not a new development. Its growing seriousness has been recognized during this decade by the nation's defense leaders as well as by Congress. Under the Reagan Administration, more than $7-billion was invested in sealift assets, those controlled by both the Navy and the Maritime Administration. Despite those efforts, however, the situation got worse since the increased number of government-controlled ships was insufficient to offset the continuing decline in the oceangoing commercial fleet. From 2,114 ships in 1947, the active merchant marine shrank to 543 in 1980 and 369 in 1987.

Commission Established

Congress, at the initiative of Rep. Charles E. Bennett (D-FL), Chairman of the House Armed Services Committee's Sea Power Subcommittee, passed legislation in 1984 to establish a "Commission on Merchant Marine and Defense" to examine the issue. The seven-member Commission was directed to study the problems of strategic lift, evaluate the adequacy of the maritime industries to meet defense requirements, and make recommendations for remedial action. To assure its independence, the Commission was made an autonomous federal agency, accountable only to the President and the Congress.

The Reagan Administration opposed the creation of the Commission, and some officials and agencies tended to view it with a suspicion that often verged on alarm. Aside from concerns about preservation of bureaucratic turf, there was the possibility that the Commission might identify a problem so serious that it would require a change in existing funding priorities. From the outset, there was opposition to any prospective finding that might require, or even imply the need for, a reallocation of budget dollars to strategic sealift, particularly in the form of support for the merchant marine.

The DoD view was that there should be adequate sealift, but the necessary funds should not be provided by DoD, and certainly not at the expense of tanks or planes or combatant ships.

During the two years of its work, the Commission held 20 meetings and conducted 16 public hearings. It published four reports, two volumes of detailed appendices, and three volumes—over 2,700 pages in total—of public hearing transcripts and related materials. The Commissioners met with both President Reagan and President Bush and testified before various Congressional committees. They conducted dozens of extensive private discussions with civilian officials throughout the government and with senior officers from the military Services, the Joint Chiefs of Staff, and the Office of the Secretary of Defense.

In their first report, submitted to President Reagan on October 16, 1987, the Commissioners found "clear and growing danger to the national security in the deteriorating condition of America's maritime industries." Throughout the balance of the Commission's existence, that bleak conclusion did not change. Indeed, it was reaffirmed in the face of overwhelming evidence that the combination of economic conditions in the maritime industries and the absence of effective leadership and action from government—both the Executive branch and Congress—were causing the deterioration to continue unabated. The Commissioners concluded that there was no possible solution to the problem that did not require expenditure of additional federal funds.

The analysis upon which the Commis-

Commission on Merchant Marine and Defense

Ex Officio Members:

Jeremiah Denton, Chairman
Former US Senator (R-AL)

John A. Gaughan
Maritime Administrator

Appointed Members:

Edward E. Carlson
Chairman Emeritus, United Airlines

William E. Haggett
President, Bath Iron Works Corporation

Admiral James L. Holloway III, USN-Ret.
Former Chief of Naval Operations

Joseph Sewall
Chairman, Board of Trustees, Maine Maritime Academy

Shannon J. Wall
Executive Vice President, District No. 1 MEBA/NMU (AFL-CIO)

sion based its findings was not confined to the requirements of a major global war, or even a major conflict in the NATO theater. Rather, it followed DoD scenarios, basing its determination of strategic lift requirements upon a relatively limited deployment of forces to a single distant theater, such as Southwest Asia, and using only United States resources—a situation in which the US would have to "go it alone."

The single-theater scenario used for the sizing of the strategic lift requirement included the deployment of about five divisions and supporting units. It envisioned the movement by sea of 2½-million short tons of dry cargo and about 31-million barrels of military petroleum products during the early surge and sustaining phases of the operation, a period measured in weeks rather than months. Although these cargo requirements are only a fraction of what would be required for a NATO or global conflict, the single-theater scenario is more stressing and demanding because of the great distances involved and because of the defense planning assumption that the US would be required to rely entirely on its own strategic lift resources.

The Commission also found that, in addition to the military requirements of a conflict, there would be significant shipping needed to support the domestic economy. Foreign-flag vessels might meet some of this need, but the domestic economy would still compete with military requirements for US-flag shipping resources.

Startling Conclusion

Even using a "best case" analysis with the most favorable assumptions, the Commissioners in their first report reached the conclusion that the US possessed insufficient ships of the required types and characteristics "to execute a major deployment in a contingency operation in a single distant theater such as Southwest Asia." "Without decisive action," they continued, "the situation will worsen substantially by the year 2000."

The conclusion was a startling one, because there had been a widespread presumption that, although the US could not itself meet all the strategic sealift requirements for a NATO or global war, it *did* itself have the resources needed for a single-theater conventional conflict.

A year later, in its third report, the Commission found that shortfalls had increased slightly for the single-theater scenario and dramatically for a global war, particularly in terms of tankers. Not surprisingly, the updated projections for the year 2000 were substantially worse. The recent very limited deployment to Panama disclosed some of the shortfalls in the existing capabilities, particularly in terms of offloading facilities and ships capable of carrying troops.

The Commission's "best case" assumptions leave out questions of required delivery dates for cargo, ship availability, land movement of cargo, onloading and offloading times, port availability, attrition, weather, and a host of other factors, any or all of which would exacerbate an already marginal situation. In a general war involving NATO, or in a conflict elsewhere against a capable adversary, such factors would almost surely produce a situation that could easily become disastrous.

Some of the assumptions made by defense planners and incorporated in the Commission's analysis are: that all needed US-flag ships could be obtained within a relatively short time; that DoD could rely upon the availability of all the militarily useful ships in the so-called "Effective United States Controlled" (EUSC) fleet (ships owned by US nationals but registered under the flags of Liberia, Panama, the Bahamas, and Honduras); and that, for a reinforcement of NATO, our European allies would be able to provide the number of ships for support of US forces to which they are committed by current planning.

To various degrees, each of those assumptions is questionable. One cannot anticipate with certainty adverse political or other circumstances. The availability of EUSC ships is the subject of considerable current debate, and may be determined by political circumstances, of which the current state of relations between the US and Panama is but one example. In the case of the availability of NATO ships, the decline in the European merchant fleets has paralleled our own, and there is increasing question about whether our allies will be able to

supply the numbers and types of ships upon which current US planning relies.

More worrisome, perhaps, are several less obvious considerations. There is growing doubt about the availability of the manpower needed to activate and operate the ships of our reserve fleets, particularly those in the Ready Reserve Force (RRF). Although the "mothballed" ships in the National Defense Reserve Fleet (NDRF) could not realistically be made available in less than 60 days, RRF ships are assumed to be available in full operational condition in periods ranging from five to 20 days after the beginning of a mobilization.

There are no military or civilian manpower reserves to man the ships. The presumption has been that manpower would come from that portion of the commercial merchant marine workforce not at the time actively sailing. As the size of the commercial fleet shrinks, however, so does the size of the workforce that it supports. The commercial workforce has declined by more than 60% since 1970 and, if current trends continue, will have a shortfall in the year 2000 of more than 12,000 personnel, from the 22,000 necessary to man all the US strategic sealift and economic support ships that would be required during war or national emergency. Moreover, there will be particular shortages in specialized skills necessary to operate the older reserve ships, such as engineers qualified to run steam propulsion plants and deck personnel able to work cargo handling gear.

An increase in the number of reserve ships at the same time the commercial fleet and workforce are declining simply makes the problem worse and creates the prospect of ships that cannot sail because of the lack of qualified personnel.

Sealift is only one component of the overall strategic lift problem. Airlift and prepositioning of equipment abroad (for example, POMCUS [Prepositioned Organizational Material Configured in Unit Sets] in Europe and the maritime prepositioning forces in the Indian Ocean and elsewhere) also are part of the equation. Any shortfalls in airlift and prepositioning would place an increased burden on strategic sealift. Unfortunately, neither airlift nor prepositioning have the actual capabilities that are assumed by current planning.

Planning assumes that the national airlift capability meets the 66-million ton-miles per day of lift stated as its interim goal; that capacity does not, however, currently exist and will not at least until the completion of the C-17 program after the year 2000.

Similarly, the US has not yet completed the "fill" of POMCUS stocks to provide the equipment for six divisions to be deployed to Europe, which presumably would increase the demand placed on strategic sealift during the critical "surge" phase of a deployment.

The question of attrition is of great concern but seems to fall into the "too hard" category during strategic mobility planning. The Commission was not able to obtain firm information to judge the magnitude and effects of attrition in various situations, but many senior officials raised serious personal concerns about it—frequently in private. In the conduct of its revised analysis during 1988, the Commission found that "when low to moderate attrition rates are introduced into the force deployment modeling process for the global war scenario, the existing average daily unit equipment delivery shortfalls increase by as much as 50%." Experience both in the Falkland Islands and in the Persian Gulf suggests the possibility that, even in low-intensity conflicts such as envisioned in the single-theater "go it alone" scenario, attrition of merchant ships could become extremely significant.

Ready Reserve Force sealift ships

The question of attrition may be relevant to another area of concern. Defense planning provides that, with the exception of about 27,000 Navy and Marine Corps personnel of the Assault Follow-On Echelon (AFOE) who would be moved by ship, all other personnel in either a single-theater or a global deployment would be transported by air. That approach presumes not only that adequate airfields will be available but that, should there be opposition, attrition rates of personnel-carrying aircraft can be kept to an acceptably low level.

Currently there is no backup planning for movement by sea. There are only two passenger ships (both in the Hawaiian cruise trade) active under the US flag, and two inactive ships plus four old troop transports in reserve, and the number of passenger ships in the EUSC fleet (which is barely adequate to meet the current AFOE requirement) is projected to decline significantly during the next 11 years.

Bigger Ships Not Necessarily Better

Ship types are as important as ship numbers. Although the increase in the size of today's merchant ships offsets much of the loss of cargo capacity caused by the reduction in numbers since World War II, increased size is a mixed blessing. The characteristics of the commercial merchant fleets throughout the world have changed in a way that, while giving the ships much greater commercial capability, tends to make them less useful for military purposes.

For example, tankers must be both capable of carrying militarily useful petroleum products (i.e., refined products such as gasoline, diesel fuel and jet fuel) and small enough to get into ports where the cargos can be discharged in a timely fashion close to the area of need. The trend toward huge tankers designed to carry crude oil or refined products in large quantities, therefore, presents a growing problem for the availability of adequate militarily useful capability.

Similarly, dry cargo ships must be capable of carrying the appropriate military cargo and of access to usable unloading facilities. In the world's commercial fleets, general purpose "breakbulk" ships have, to a large extent, been replaced by large container ships that move cargo quickly and efficiently in standard size containers or "boxes." They normally lack onboard cargo handling capability and must rely on complex and extensive loading and offloading facilities on shore. If port facilities are available and secure, containerships have great military utility for the movement of large volumes of cargo such as ammunition and supplies. Much military cargo, however, particularly "unit equipment" (wheeled and tracked vehicles, helicopters, artillery, and a host of logistics equipment), is not readily suitable for containerization. Ships ideal for the movement of unit equipment (roll-on/roll-off, breakbulk, and other noncontainerships) have mostly been driven from the seas by containerships and specialized car carriers. Even the car carriers, designed to carry the maximum number of commercial automobiles in minimum space, rarely have the deck spacing or strength to carry heavier military equipment.

The containerships themselves have become increasingly large (some too large to pass through the Panama Canal) and reliant, even in Western Europe, upon an increasingly limited number of vulnerable ports. In other areas of the world, such as Southwest Asia, there are few if any shoreside facilities, and the off-loading of large containerships "over the beach" or in

unimproved ports would be costly in both time and resources.

Shipbuilding Decline

The ability to build new ships has also deteriorated. Because of the inability of American yards to compete in terms of price, and frequently efficiency, with foreign shipyards, there are currently no oceangoing merchant ships under construction in the US. The shipbuilding industry, along with its suppliers of machinery and equipment, is almost entirely dependent on a shrinking volume of government (mostly Navy) business.

Even that work tends to be concentrated in a small number of shipyards. Five major yards have the majority of contracts for Navy new construction (Bath Iron Works, General Dynamics Electric Boat, Newport News Shipbuilding, Ingalls Shipbuilding, and Avondale Industries). Repair work is similarly concentrated in the eight naval shipyards, which currently have no new construction capability, and in private shipyards (mostly in Navy home-port areas) that either have no new construction capability or have seen that capability decline as they have concentrated upon the very different demands of repair work. Shipyards upon which the burden of constructing a substantial number of merchant ships would fall during a mobilization or war are shrinking in number and capability. Many have gone out of business or are in imminent danger of doing so.

Commission Recommendations

In its second report, submitted in January 1988, the Commission laid out a broad set of seven major recommendations containing an integrated program to reverse the decline in the maritime industries. The recommendations centered around the issuance by the President of a clear statement of national policy; reform of the Operating Differential Subsidy (ODS) program, designing to offset the difference between US and foreign costs for operating merchant ships; establishment of a "Procure and Charter" program to build militarily useful vessels for charter to private operators under terms that would allow effective competition for commercial cargoes; and a variety of other measures.

The reaction to the recommendations was, to put it mildly, restrained. Neither the Executive branch nor the Congress showed any inclination to act rapidly or decisively, and even the maritime industries had mixed views. In consequence, the Commission during 1988 carefully analyzed and reevaluated its recommendations. It prepared a detailed cost/benefit analysis, which was published in its third report, submitted during the fall. The analysis led to revisions to several recommendations, and the revised recommendations and corresponding cost/benefit analysis were contained in a fourth report dated January 20, 1989 and submitted personally to President Bush on February 16th.

The fourth report contained a detailed set of legislative goals that were intended to lay out with some specificity the nature and content of legislation required to implement those portions of the Commission's recommendations requiring changes to the law. Legislation based on those goals was drafted at the behest of Congressman Bennett, and was introduced in the House on May 24th as the "Merchant Marine and Defense Act of 1989."

The bill is a long and complex one, designed to implement those aspects of the Commission's recommendations requiring legislative action. Although there are many provisions, two are major: (1) Reform of the ODS program, including allowance for limited foreign procurement of ships, and (2) Establishment of a "Procure and Charter and Shipyard Improvement" program for design and construction, at an average rate of 12 ships per year, of militarily useful merchant vessels to be chartered to commercial operators at rates allowing effective competition for commercial cargo.

Other provisions deal with such matters as the design and prototype construction of ships that could be built in quantity during a mobilization, the reform of the Federal Ship Mortgage Insurance (Title XI) Program, expansion of the cargo preference statutes governing the shipment of US government cargo, establishment of maritime manning requirements through the regulatory process and establishment of a public/private funded maritime R&D program.

In introducing the bill, Rep. Bennett and his cosponsors stated, based on the Commission's cost/benefit analysis, that the total cost to the government would be $13.4-billion over eleven years, but that federal government revenues of $7.5-billion during the same period from charter fees and increased taxes would reduce the net cost to $5.9-billion. Moreover, the expenditure of the federal funds would add over $43-billion to gross national product and create, directly and indirectly, almost 120,000 jobs.

Certainly $1.2-billion of federal funds each year for 11 years is significant, particularly in a time of tight budgets, but it is not overwhelming. It is less than one-third of the cost of the C-17 program, and is in the same ballpark as the annual expenditures on government-owned strategic sealift resources during the early 1980s.

Despite the growing urgency of the problem, the prospects for early passage of the bill seem poor.

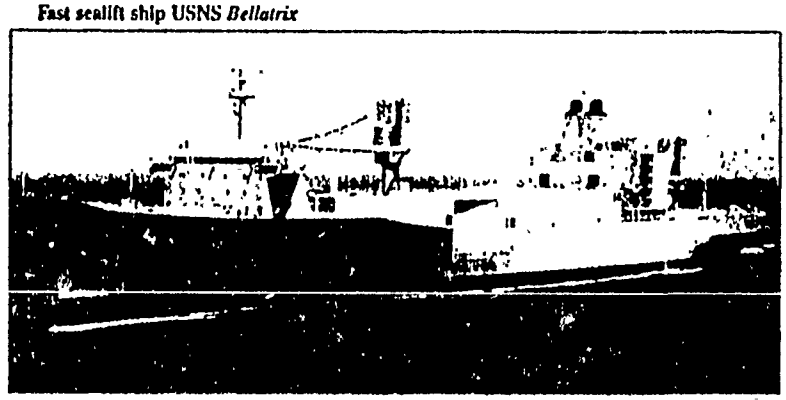
The issue is not one of supporting the merchant marine at the expense of some other national security component. It is one of having adequate strategic sealift, and a healthy merchant marine continues to be the most cost-effective and efficient way to do it. The focus should not be on the allocation of resources within DoD but, rather, on national priorities. As Admiral Crowe said, it is "a national problem."

Clearly the position of the President will be crucial. The Commission, in its first report and in all that followed, urged the definition and promulgation of a reaffirmed and restated National Maritime Policy and, in the fourth report, even provided a draft statement. The reiteration of the importance of the issue by the last three Secretaries of Defense, the statements of senior uniformed personnel, and the President's ongoing review of national security policy suggest that the essential Executive branch leadership may well be forthcoming. The prospect for action now appears better than at any time during the past several years.

On the other hand, there is a fascination with a high-tech fix for a low tech problem: some people argue that we don't need slow merchant ships but "very fast" sealift ships, capable of speeds of 50 knots or more, in order to reduce transit time to Europe. There has been no analytical demonstration that transit speed is the crucial variable in the sealift equation; indeed gains from improved onload and offload time, which could accrue from improved ship design, appear substantially greater than gains from decreased transit speed.

Very fast sealift ships are frequently described in terms of a "sea bridge" to Europe, but such ships built on the basis of any of the known technologies, none of which is yet sufficiently developed, would consume vast amounts of fuel, perhaps even more than their cargo capacity. That would be a crucial limitation for the most stressing contingency, the deployment to a single distant theater such as Southwest Asia.

Fast sealift ship USNS *Bellatrix*



Procurement of enough very fast sealift ships would involve acquisition expenditures at least three times the total cost of the program provided in Congressman Bennett's bill, without considering crewing, operating, and maintenance funds. Since operating costs would be many times those acceptable in commercial service, there would be little or no commercial market for the ships and the government would have to bear the entire financial burden.

It is ironic that some critics who call the Commission's program "too expensive" are willing to endorse a prospective solution, not even currently achievable, that would cost more than three times as much. The prospect serves to divert both attention and resources from a solution, less high-tech to be sure, that would make a larger contribution more quickly and at less cost.

The Problem Will Not Go Away

One way or another, we must address the availability of adequate strategic sealift. It is clearly pointless to have the best-trained, best-equipped military forces in the world if we cannot transport and support them where and when they are needed.

The problem requires coordinated action from the Executive branch, the Congress, and the private sector. The Commission's work and the Bennett bill are sound starting points in that process.

We can act now, while there is still a chance to achieve the necessary results at a reasonable cost, or we can delay until even our current capability has disappeared, the danger is even more acute, and there is no alternative to radical action at extremely high cost. ■ ☆ ■

Allan W. Cameron was the executive director of the Commission on Merchant Marine and Defense from January 1987 until its termination on 31 March 1989. He served on destroyers from 1960-63 as a naval officer, taught political science at Bates College, and was associate dean of the Fletcher School of Law and Diplomacy at Tufts University. He served as executive assistant to Sen. Jeremiah Denton (R-AL) from 1981-86. Cameron holds a PhD from the Fletcher School of Law and Diplomacy.

"Airlift, Sealift in Short Supply at Very Time Need Grows Fastest" by Benjamin F. Schemmer. Armed Forces Journal International (May 1989): 66-68.

- Thesis: United States strategic mobility problems continue because strategic sealift capabilities have decreased over the last decade and the increase in US strategic airlift capabilities has not kept pace with requirements.

- Shortfall in US Sea and Air Lift

  -- The NATO commitment of 10 divisions in 10 days will take 30 days.

  -- Since 1979 NATO's strategic sealift capacity in tonnage has dropped by 39 percent.

  -- General Vuono, Army's chief of staff, said the Army's biggest area of vulnerability in the event of conventional war was "strategic lift capability."

  -- General Galvin, supreme allied commander Europe, said, "I've got to have the C-17 for the first 10 days, but after that I need sealift." He added that we must revive the merchant marine to solve our sealift shortfall.

- Improved Strategic Lift Capabilities Unlikely

  -- The Navy has been slow to formalize an operational requirement to build fast sealift ships and, as a result, none are on the horizon.

  -- Although the last of the 50 C-5Bs ordered in the Reagan Administration were delivered in April 1989, the first C-17 won't become operational until September 1992 at the earliest. The last programmed C-17 won't be delivered until after the year 2000.

  -- Capabilities will increase with the C-17, but requirements have increased at a faster pace.

- The Army is Harder to Move

  -- Despite some conversions to light infantry divisions, the Army's stateside forces require more lift than in 1980.

  -- The Army needs 37 percent more C-17 sorties than it did 10 years ago to get US-based forces into battle.

- Increased Emphasis on C-17 Needed

  -- Airlift still ranks third on USAF's modernization

priorities, behind strategic and tactical forces.

-- With all C-141, C-5, and KC-10 capabilities, MAC is still 30 percent short of its goal of 66-million ton-miles per day.

-- However, the Pentagon has not increased its planned buy of 210 C-17s.

- Strategic Lift Problem Developing at Critical Time

-- Withdrawal of troops from Europe and the Far East seems likely.

-- Admiral Crowe recently told Congress, "If fiscal realities were to require force reductions both home and overseas, our mobility assets would become even more critical."

-- Senator William S. Cohen, the ranking minority member of the Subcommittee on Projection Forces and Regional Defense, said, "Our allies want our support, but not our forces there. They want us just over the horizon. Our principal national security priority is projection of force capabilities."

Lt Col John Dalton, USAF
Irene Pearson-Morrow, ed.

Airlift, Sealift in Short Supply at Very Time Need Grows Fastest

by

Benjamin F. Schemmer

THE US is woefully short of airlift and sealift, and the problem will get worse before it gets better.

The Army still can't get to war on time, won't be able to in the foreseeable future, and is getting harder to move, not easier. It owns far more divisions than the US has airlift or sealift to move them overseas, and it takes 37% more airlift to move them than it did 10 years ago.

Although more than four division sets of equipment are now prepositioned in Europe, the US still can't meet the commitment it made to NATO in 1982 of having 10 divisions in Europe within 10 days of a decision to reinforce. It takes closer to 30 days' using virtually all of the US' airlift force and a vast amount of the fastest sealift available. The US reinforcement plan calls further for another 10 divisions to be committed to NATO within the first few months of a conflict.

General Carl E. Vuono, the Army's Chief to Staff, told *AFJI* in an October interview that his major concern in the event of conventional war, the Army's biggest area of vulnerability "is strategic lift capability."

Airlift and sealift are becoming increasingly important linchpins in America's national security strategy, but the prospects of getting more airlift or sealift in the next five years are bleak, perhaps negligible. The last of the 50 Lockheed C-5Bs ordered in the Reagan Administration, for instance, was delivered on April 17th, and the first McDonnell Douglas C-17 won't become operational until September of 1992 at the earliest. (In early 1980, then Defense Secretary Harold Brown had directed that the plane, then known as the C-X, achieve an initial operational capability by September of 1985, but its funding priorities slipped after Brown decided in 1982 to reopen the C-5B production line and also buy KC-10s first. The contractors' C-X bids weighed *nine tons*.)

Fast sealift ships, which regional commanders-in-chief cite as their biggest long-term need, are not even on the horizon, and sealift forces overall are in even shorter supply than airlift. Since 1979 NATO's strategic sealift capacity has shrunk from 4,534 ships to 1,885, and the tonnage they can carry has dropped by 39%. (See table).

General John R. Galvin, the Supreme Allied Commander Europe, told *AFJI* in early April, "I've got to have the C-17 for the first 10 days, but after that I need sealift. The answer is to revive the merchant marine." But as General Vuono noted last October, "The sealift problem is broader than just the Department of Defense. It gets into the whole merchant vessel fleet problem." Notwithstanding recent studies ordered by Congress, little is being done.

The Fast Sealift Catch-22

Sen. Edward M. Kennedy (D-MA), who heads the Senate Armed Services Subcommittee on Projection Forces and Regional Defense, learned in mid-April that sealift has become a catch-22 issue. The Navy had just sent Congress a long-awaited study on the feasibility of building very large fast sealift ships, ones which might move an entire Army division to Europe in four days. The report showed that the technology was closer at hand than some skeptics have believed. Kennedy asked what the Navy planned to do about it, since regional commanders-in-chiefs and the Army have been begging for such ships for years. Kennedy was told the Navy was about to launch another study. Asked why it needed another study, the Navy said it couldn't spend any money on the program because it had no "TOR"—Temporary Operational Requirement. Kennedy asked who writes the TOR. The Navy said it does.

In March of 1988 General Glenn K. Otis, then Commander-in-Chief of US Army Europe, told the Senate Armed Services Committee, "We need a 'sea bridge' to Europe." This year, Sen. Kennedy seemed bemused to learn the Navy can't build one because it has "no requirement" for the problem it's supposed to solve.

Ill-timed Hiatus

This hiatus in strategic lift is developing at an awkward moment in history. The likelihood is that the US will have to be more prepared than ever to move its stateside-based forces to some foreign contingency in a hurry. Pressures are building to withdraw troops from Europe and the Far East—whether because of Congressional impatience with allied burden-sharing or to pare down overseas forces as an expendient fix to the defense budget squeeze or because of hoped-for reductions in European force levels as a result of negotiations on conventional arms reductions.

General Duane H. Cassidy, Commander-in-Chief of US Transportation Command and Commander-in-Chief of Military Airlift Command, sums it up this way: "Reducing our

NATO's Strategic Sealift Capacity

(Dry Cargo Only; Bulk Cargo Ships Excluded)

	Number of ships		Capacity (1,000 tons)	
	1979	1989	1979	1989
US flag	280	154	4,954	3,946
MSC controlled	30	40	374	941
RRF	6	81	73	1,359
EUSC	44	19	343	294
NDRF	168	114	1,801	1,311
US sub total	528	408	7,545	7,851
NATO	4,006	1,477	36,341	18,851
Total	4,534	1,885	43,886	26,702

Weight Growth of Army Units

(Weight in Tons)

As of:	Mech Div	Abn Div	Air Assault Div
1980	66,748	17,724	15,900
1981	73,099	-	-
1985	93,373	22,783	30,215

1. CMMS data (Scenarios 1 or 2) from USAF Studies and Analysis Center
2. CX data provided by CX Program Office to evaluate capabilities of proposed CX design
3. J Series VTAADS data (April 1985) from TRADOC, US Army

troop strength in Europe will not only exacerbate our ability to rapidly reinforce Europe but other theaters as well."

Admiral William J. Crowe, Jr., Chairman of the Joint Chiefs of Staff, told Congress in March, "If fiscal realities were to require force reductions both home and overseas, our mobility assets would become even more critical."

The prospect of troop withdrawals looms even closer on the horizon because allies are growing uncomfortable with the American presence. That's been especially evident in news stories from South Korea, but it's a major concern in Europe as well. Sen. William S. Cohen (R-ME), the ranking minority member of the Subcommittee on Projection Forces and Regional Defense, told the annual luncheon of the American Defense Preparedness Association on April 19th, "Our allies want our support, but not our forces there. They [now] want us just over the horizon." Cohen added, "Our principal [national security] priority is projection of force capabilities."

The Army Is Harder to Move

The Army has worked hard to improve its strategic deployability by creating five new light infantry divisions (some converted from the heavier regular infantry divisions), but its stateside forces require more lift than in 1980, not less. Army mechanized divisions are 40% heavier—the 101st Air Assault Division 90% bigger, the 82nd Airborne Division 29% heavier—than in 1980, when a Congressionally Manadated Mobility Study to set long-range airlift and sealift goals was launched. Indeed, even the light divisions now require about 5% more lift than the Army envisioned in 1985. The situation will get even worse, since the Army now wants to convert the 9th Motorized Infantry Division at Ft. Lewis, WA, into a mechanized division: that would increase its lift requirements by 66%, from 730 C-17 sorties to 1,209.

The net result: it takes far *more* airlift to get the Army's US-based forces into battle than it did 10 years ago. By *AFJI*'s calculations, in 1980 it would have required 7,052 C-17 sorties to move just the Army's active divisions overseas; today it would take 9,661 sorties, a 37% increase.

37% Greater Need, but Same Number of C-17s

But the weight or lift creep problem is not one the Services appear to worry about. Neither the Army nor Military Airlift Command said they had—or could find—any data comparing 1980 and 1989 lift requirements for different Army divisions. One might think both organizations would be tracking the problem carefully: the number of C-17s the Pentagon plans to buy has been fixed at 210 aircraft (plus three planes for test) since 1981, but airlift requirements have grown dramatically in the interim. It would take 298 C-17s today to do the job the 210-plane fleet was designed for 10 years ago. But neither the Air Force nor the Army has suggested increasing the C-17 buy by one plane. Indeed, airlift still ranks third on USAF's list of modernization priorities: strategic forces comes first, tactical forces next, airlift last.

There isn't much "table-thumping" to make strategic lift the issued many think it should be. On April 18th instance, USAF General Thomas C. Richards, the Deputy Commander-in-Chief of US European Command, testified before the Senate Armed Services Committee on "Military strategy and operational requirements for NATO defense and rapid reinforcement." But the C-17 was just one of 24 specific hardware programs for which he asked Congressional support; it was lost in his wish list. Airlift and sealift weren't mentioned until page 12 of his 16-page statement. each got a short paragraph. they totaled about 1/40th of his prepared text.

It takes 29,591 C-141B and 4,361 C-5 sorties to move all of the Army's US-based active and reserve divisions overseas. But Military Airlift Command today has only 234 C-141s and 110 C-5s. Here's what that means. Take a hypothetical set of contingencies in which *no* airlift was required for tactical air squadrons or Marines; in which the airlift force flew round-the-clock, back-to-back sorties; and in which all the planes are loaded and unloaded instantaneously. It would take 84 days to get the Army to war by C-141 and 26 days to move its outsize cargo in C-5Bs. But in one of the key scenarios for the 1981 mobility study, Army forces accounted for only about half of the initial lift required.

How Army Airlift Requirements Have Grown

	1980 Active Forces[1]			1989 Active Forces[2]		
Type of Division	# Units	Weight[3]/Div	Total Weight	# Units	Weight[3]/Div	Total Weight
Airborne	1	17,724	17,724	1	22,783	22,783
Air Assault	1	15,900	15,900	1	30,215	30,215
Infantry	2	29,202	58,404	0	-	0
Light Infantry	0	-	0	2	13,534	27,068
Motorized	0	-	0	1	43,864	43,864
Mechanized	4	66,748	266,992	4	93,373	373,492
Armored	2	67,883	135,766	2	90,216	180,432
Total	10		494,786	11		677,854

The 50th and last C-5B was delivered to the Air Force on April 17th. Those planes have increased Military Airlift Command's lift capability by 7½-million ton-miles per day since the first one was delivered in 1985. Coupled with programs to stretch MAC's C-141s so they could carry about 30% more cargo and to buy 44 KC-10 cargo/tanker aircraft (both long completed), MAC has realized an 87% increase in its strategic airlift capability over its 1980 level of 24.6-million ton-miles per day. But MAC is still 30% short of its interim, budget constrained goal of 66-million ton-miles per day, a compromise figure that came out of the 1981 Congressionally Mandated Mobility Study. (Of four contingencies studied, the *least* demanding one required 83-million ton-miles per day, 26% more than the interim goal.) With the C-5B out of production and the C-17 just entering production, no airlift capability will be added for the next four years, and the 66-million-ton-mile goal won't be attained until after the year 2000, when the last of 210 C-17s will be delivered.

By that time, of course, no one knows how heavy the Army will be.

"The US Transportation Command--Up and Running." Defense Transportation Journal 45, no. 1 (February 1989): 22-24.

- Thesis: The US Transportation Command has improved the nation's ability to transport combat forces, but significant challenges remain.

- Background

  -- The US Transportation Command (USTRANSCOM) took full operational control of common-user transportation forces of its component commands on 1 Oct 1988.

     --- The three component commands are the Navy's Military Sealift Command, the Army's Military Traffic Management Command, and the Air Force's Military Airlift Command.

  -- The previously established Joint Deployment Agency was integrated into USTRANSCOM.

     --- Functions include planning, coordinating and monitoring deployments, and sustaining and redeploying combat forces and equipment.

- USTRANSCOM Mission

  -- Provide global land, sea, and air transportation to meet national security needs.

  -- Component commanders maintain operational control over their forces while USCINCTRANS exercises overall command.

  -- Participates in exercises to refine its plans and procedures as well as those of warfighting commands it supports.

     --- Manages deployment execution, coordinates closure estimates for theater commanders, and publishes force movement schedules.

     --- Peacetime and wartime procedures are identical; only the tempo of activity should change.

- Challenges for USTRANSCOM

  -- Integrate a global command, control, communications, and computer network to provide flexibility and information to decision makers at every level of responsibility.

--- Network must link DOD, DOT, other federal agencies, the transportation agencies of allied nations, and the civil transportation sector.

-- USTRANSCOM must advocate mobility policies and assets required to better support national strategy.

--- Includes a National Sealift Policy, a stronger US Merchant Marine, additional sealift ships, additional military cargo aircraft, additional Civil Reserve Air Fleet cargo-capable aircraft, improved containerized ammunition outload capabilities, and additional trucking and rail assets to move outsized cargo.

-- Improve readiness posture of transportation community.

--- Advocate importance of timely mobilization decisions by national command authority.

--- Maintain vitality of commercial air, land, and sea carriers.

--- Continue to refine movement requirements of deploying units to conserve lift resources.

Lt Col Larry Radov, USAF
Irene Pearson-Morrow, ed

U.S. Transportation Command

General Duane H. Cassidy
Commander in Chief
USTRANSCOM

Gen. Duane H. Cassidy serves at Scott AFB, Illinois, in the dual capacity of Commander in Chief of the U.S. Transportation Command and Commander in Chief of the Military Airlift Command. As Commander in Chief of the U.S. Transportation Command, he is responsible for strategic mobility planning and wartime transportation by land, sea, and air for all U.S. fighting forces to any point in the world. As Commander in Chief of the Military Airlift Command, he commands, supervises, trains, and equips forces that provide airlift, special operations, rescue, and aerospace environmental and visual information services to U.S. combat commands wherever located, and airlift support to the Office of the President. Gen. Cassidy is designated the Executive Director of the Single Manager for Airlift Service and is responsible to the Secretary of the Air Force for worldwide air transportation and air logistics support of U.S. forces in peacetime.

Vice Admiral Albert J. Herberger
Deputy Commander in Chief
USTRANSCOM

The U.S. Transportation Command—Up and Running

The United States Transportation Command (USTRANSCOM) became fully operational on Oct. 1, 1988 at Scott AFB, Ill under its Commander in Chief, USCINCTRANS, Gen. Duane H. Cassidy, USAF. On that date, he took operational command of the common-user transportation forces of USTRANSCOM's component commands. They are the Navy's Military Sealift Command, headquartered in Washington DC, the Army's Military Traffic Management Command, headquartered at Falls Church, Va., and the Air Force's Military Airlift Command, headquartered at Scott AFB, Illinois.

Prior to that event, the former Joint Deployment Agency from MacDill AFB, Fla. was integrated into USTRANSCOM headquarters. That addition contributed to an authorized headquarters strength, at the beginning of Fiscal Year 1989, of 371 civilians and military people of all uniformed services. While the Joint Deployment Agency no longer exists as a separate organizational entity, its functions continue to be performed throughout USTRANSCOM headquarters. They include planning, coordinating and monitoring deployment, sustainment and redeployment of combat forces and their equipment using the Joint Deployment System, a system operating within the Worldwide Military Command and Control System. Through it, USTRANSCOM manages deployment execution, coordinates closure estimates for use by overseas theater commanders, and publishes force movement schedules. The staff is participating in the development of the Joint Operation Planning and Execution System (JOPES) which will integrate crisis action and deliberate planning into a single planning and execution system.

The broad USTRANSCOM mission is to provide global land, sea, and air transportation to meet national security needs. It supports the other unified and specified commands by managing and providing its components' common-user transportation forces in crisis or war. Each component commander retains operational control over his own forces while USCINCTRANS exercises overall command of those forces. USCINCTRANS also is a linchpin in the joint strategic mobility planning process of deliberate planning. He orchestrates all phases of the refinement of operation plans including transportation orientation throughout the process. The command participates in exercises to refine its own plans and procedures as well as those of the warfighting commands which it supports. As for shifting from a peacetime to a wartime footing, the guiding principle is that peacetime and wartime procedures should be identical, only the tempo of activity should change.

This unified transportation command offers several advantages over previous methods of managing mobility and deployment. It improves joint coordination of transportation planning and execution. It optimizes use of transportation resources. It requires integration of numerous communications and computer systems into one user-oriented network of systems which will provide information tailored to each decision maker at every level of responsibility.

That network of systems will be part of a global command, control, communications and computer network, called the Global Transportation Network (GTN), which will provide the reins of unified transportation command. To acquire such a network, USTRANSCOM is developing a Command, Control, Communications, and Computer Systems Master Plan—the road map toward a fully capable global mobility management system which will include the ability to track mission-essential troops and material with total intermodal intransit visibility from origin to overseas destinations and return. That visibility is essential because the command must be able to marry troop movements and equipment shipments as well as divert movements and reorder their priorities to respond to the dynamics of modern combat. Thus flexibility is the key to responsive transportation because, historically, there has never been enough transportation available in wartime to satisfy all demands.

Good communications and computer systems are the keys to that flexibility. They must link all members of the global transportation community including the Department of Defense, the Department of Transportation, other federal agencies, the transportation agencies of allied nations, and the civil transportation sector.

In addition to making more efficient use of the limited transportation assets already available, USCINCTRANS strongly advocates mobility policies and assets required to better support the national strategy of forward defense. These include a National Sealift Policy articulated at the highest level of government, a stronger United States Merchant Marine, additional sealift ships, additional military cargo aircraft, additional Civil Reserve Air Fleet cargo-capable aircraft, improved containerized ammunition outload capabilities, and additional trucking and rail assets to move outsize cargo.

Gen. Cassidy also advocates stronger USTRANSCOM ties with the civil transportation sector upon which USTRANSCOM would rely for the bulk of national defense transportation in wartime. In view of that heavy reliance, he has participated vigorously in a cooperative effort with the National Defense Transportation Association to communicate with the civil sector and other government agencies to help focus on solutions to national mobility problems, including shortages of airlift and sealift.

A major step in this effort was the NDTA's 43rd Annual Transportation and Logistics Forum in October 1988. Its theme, "Deterrence Thru Deployment," helped focus national attention on the important role of civil transportation industries in projecting military power abroad.

Throughout the forum's panel discussions, three themes repeatedly surfaced as keys to improving the readiness posture of the defense transportation community.

First, timely mobilization decisions are essential because procedures for activating reserve forces, generating civilian transportation and preparing host nation reception facilities need to be initiated as early as possible.

Second, close and smooth interaction among DoD, DoT, FEMA, USTRANSCOM and its components, civilian agencies and other government agencies is critical to successful allocation of the nation's mobility resources.

Finally, there is a need for deploying units to continue to refine the identification of their movement requirements so that limited, precious lift resources would not be wasted.

NDTA's eagerness to engage in productive dialogue on a subject of vital national importance during this forum is witness to the wedding of the public and private transportation communities by compulsion of circumstance. The vitality of commercial air, land and sea transportation carriers is as important to U.S. forward defense strategy as the readiness of the nation's combat forces.

For the benefit of the other unified and specified commanders whom he supports, Gen. Cassidy also brings his advocacy of transportation issues to the Secretary of Defense's Defense Resources Board and throughout the Planning, Programming and Budgeting System. Consequently, transportation now receives attention at least equal to that afforded other readiness issues and acquisitions of weapons systems, many of which will depend on transportation for their effective use in combat.

Throughout the Department of Defense, there is, indeed, wide recognition of Winston Churchill's maxim, "Supply and transport stand or fall together; history depends on both."

"The C-17 in an Iran Scenario: A Perspective Beyond 66-Million Ton-Miles per Day" by Lt Col J. David Patterson. Armed Forces Journal International (January 1988): 42-48.

- Thesis: Airlift is hampered by an overemphasis on achieving intercontinental ranges and speeds to the exclusion of other important aspects of the total airlift system such as direct delivery capability.

- Background

  -- With the emphasis on building conventional forces in the 1960s, a greater requirement emerged for projecting US forces over long distances at speeds only jet aircraft could achieve.

     --- This requirement referred to as intertheater or strategic airlift was initially satisfied by the C-141 and later the C-5.

  -- Concerns over adequate airlift capability led to the 1981 Congressionally Mandated Mobility Study which established an airlift goal of 66 million ton-miles per day (MTM/D).

  -- In 1982 a debate occurred over whether to buy C-5Bs or the lower-cost 747s to help reach the airlift goal. The C-5B was selected because of its military utility despite its higher cost.

     --- The C-5B can carry key outsized equipment that troops need to survive, whereas the 747 can not.

  -- A 1986 Congressional Budget Office study compared the C-17 program with other airlift alternatives to see which came the closest to satisfying the 66 MTM/D goal. The study favored a C-5/747 combination that overlooked military utility such as direct delivery.

- C-17 Military Utility

  -- Life cycle cost of C-17 aircraft is $16 billion less with 15,000 less support personnel and crew members.

  -- Based on flying hour utilization rates, the C-17 outhauls the C-5B slightly.

  -- Because of its backing ability, payload, and short ground time, the C-17 translates into a least an 85 percent greater cargo throughput capability at large, medium, or small airfield ramp areas.

-- Can deliver cargo directly where it is needed into airfields with runways 3,000 ft long and 80 ft wide.

--- Direct delivery eliminates the need to reload cargo onto C-130s for transshipment forward.

--- Direct delivery allows for airlift of outsized heavy firepower to confront an enemy as far forward as possible.

- C-17 versus C-5 in Southwest Asia Scenarios

-- In two simulations, direct delivery is able to cut the advance of penetrating enemy forces at least in half.

--- The C-17 provides timely direct delivery of troops and heavy firepower to a position where they offer great resistance to the enemy's advance.

--- Time required to maneuver troops and heavy equipment to battle line is greatly reduced.

- Achieving a 66 MTM/D airlift goal must be balanced with the military utility the equipment provides. The C-17 provides a unique and valuable military utility with direct delivery.

Lt Col Larry Radov, USAF
Irene Pearson-Morrow, ed

The C-17 in an Iran Scenario: A Perspective Beyond 66-Million Ton-Miles per Day

by

Lt Col J. David Patterson, USAF

Airlift, though recognized as a potent and timely capability for projecting troops and equipment to counter an advancing enemy, suffers from a pervasive misperception. Its definition is hampered by an overemphasis on achieving intercontinental ranges and speeds to the exclusion of other important aspects of the total airlift system. The preoccupation with the intercontinental airborne transportation mission, variously referred to as "long-range," "strategic," and "*inter*theater," has been endemic to the thinking about airlift. During the 1980s, this persistent misperception has become codified as an airlift goal of 66 million ton-miles per day (MTM/D), first established by the 1981 *Congressionally Mandated Mobility Study*. It's not that there is anything intrinsically wrong with 66 MTM/D, so long as there is some assurance it can be delivered where needed, in time.

After a decade and a half of reliance on nuclear superiority, President Kennedy changed the direction of America's defense effort to emphasize building conventional forces. Consequently, there emerged a greater requirement for projecting US forces over long distances at speeds only jet aircraft could achieve. Propeller-driven aircraft available at that time were not up to the requirement; the C-141 and later the C-5 were developed to answer the need for long range and speed. The asymmetric involvement with long-range airlift that evolved with the C-141 and C-5 has been the chief nemesis for those advocating the modernization of airlift with the new McDonnell Douglas C-17.

The understanding has been that there would be airfields with runways, taxiways, and ramps capable of handling these aircraft at the destination. And once the men and materiel were on the ground, it was up to the ground forces and the tactical C-130s to move the troops and equipment forward.

However focusing primarily on a millions-of-ton-miles capability leads to inappropriate and impractical solutions to the airlift shortfall. If the only concern is moving undefined cargo of some known weight, then any large tube with wings will do. Typical of the confusion this generates was the heated debate that took place in Congress in the spring of 1982 following the award of a contract to Lockheed for an additional 50 C-5Bs. Boeing attempted to make a case for its 747 aircraft as a lower-cost alternative to additional C-5s, basing its argument on the 747's capacity to haul bulk, oversize, and some outsize items strategic distances, as well as the 747's earlier availability since it was already in production.

Lockheed survived the challenge by Boeing on the weight of testimony by the military Services and Sen. Sam Nunn (D-GA) extolling the virtue of the C-5's unique military capability to carry a greater variety of outsize equipment. During the Senate debate of May 13, 1982, Sen. Nunn offered the following argument against the proposed amendment to buy Boeing 747s, characteristically emphasizing the military aspects of the C-5:

> We have key equipment that has to be on the ground if our troops are going to survive. Mr. President, you cannot get a combat engineer vehicle in a 747. You cannot get a CH-47. You cannot get the 8-inch self-propelled howitzer. You cannot get the 155-millimeter self-propelled howitzer [in a 747]. ... Yet, because they are both airplanes, people, too many people, are not looking at the fundamental difference between the C-5 and the 747.... So, I urge my colleagues to take a close look at the equipment, take a close look at the military

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argument. There is not a single uniformed military person that I know who is supporting th[illegible] amendment.

Generally, there was an ambiguous understanding of the relative military worth of the C-5 and 747 ton-miles. An inappropriate emphasis on range and speed in reducing the strategic airlift mobility shortfall created the issue for the debate.

Military Utility Overlooked

Clearly, millions of ton-miles per day will not disappear, at least as a bookkeeping measure in force-level cost-comparison studies. Even the *US Air Force Airlift Master Plan* (AMP) tallied MTM/D, albeit augmented by transshipment sorties in-theater at the end of intertheater C-17 missions. However, at a minimum, such cost assessments should include supporting evaluations of military worth. Such assessments should consider important airlift system constraints on total tons delivered per day, to include origin and destination airfields and road march times for delivering specific military units to defined destinations within a stated time limit. Is this not the sort of reference to military utility Sen. Nunn found absent in the Boeing 747 proposal?

The kind of substitution of big airfield and commercial aircraft ton-miles for military capability that Sen. Nunn warned against persists. The Congressional Budget Office (CBO) published a September 1986 study of the C-17 program and other alternatives for improving strategic mobility. Several times this report noted that the military Services do not believe the 66 MTM/D goal would be sufficient to meet the requirements of a major conflict with the Soviets; rather, it represents a compromise between meeting the needs fully and holding down costs. The actual goal could be as high as 112 MTM/D, a value suggested in the CBO study which assumed an all-out war in Europe requiring "479,000 tons of cargo in a 15-day period." But the CBO study substituted big-airfield C-5 ton-miles and 747-type commercial ton-miles to achieve the 66 MTM/D *Congressionally Mandated Mobility Study* goal, in place of the C-17's direct delivery capability While the CBO was quick to acknowledge the substantial sacrifice of military utility, the economic tradeoffs prevailed.

Even viewed as simply a MTM/D issue, there is a compelling argument favoring the C-17. The Military Airlift Command's (MAC) total force cost studies in the AMP found that the C-17 program saved 15,000 personnel and resulted in a cost savings of $16-billion over the life of the airplane. MAC's Directorate of Studies and Analysis, in a March 1984 study, compared the C-17 and C-5 with regard to the contribution each made to the strategic airlift requirement. When anticipated flying hour utilization rates are considered, the C-17 is more productive. MAC found that the contribution to the long-range ton-mile requirement provided by 108 C-17s, when flown at system-limited wartime hours per day, would be 15.64 MTM/D, while an equal number of C-5Bs provide 15.53 MTM/D.

One of the more appropriate ways of viewing the dynamics of the airlift requirements is to analyze those demands in a realistic and challenging combat scenario. So, with Sen. Nunn's advice to "take a close look at the military argument" firmly in mind, the remainder of this article will describe the unique military utility of the C-17 and its contribution in conjunction with the current airlift system in three ways:

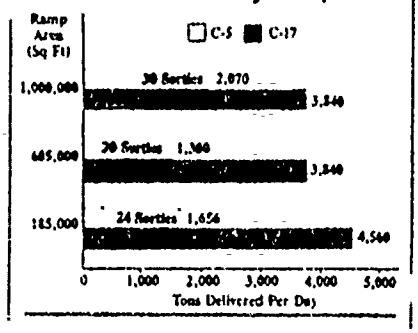
- through an examination of ramp flow-though or throughout, for varying ramp sizes;
- in a hypothetical but representative conflict scenario (a US military deployment to blunt an incursion by Soviet forces into Iran); and
- by a study of the timeliness of deliveries by airlift.

The Iran scenario is a representative extension of the ramp flow-through analysis, since it includes factors typical of difficult tasks for airlift found throughout the world: terrain problems, limited available airfields, and a requirement to deploy a sizeable US force. The prudence of looking at US capability to project forces to discourage Soviet adventurism in Iran was put succinctly by Joshua Epstein in his book *Strategy and Force Planning: The Case of the Persian Gulf*. He observed: "In summary, given the extremely grave consequences that would attend a successful Soviet attack, given the potential threat posed by Soviet forces north of Iran, given the uncertainty surrounding Soviet intentions in the region and recognizing the economic importance and political instability of the area, it is a contingency that

no responsible analyst can ignore." Before dealing with a notional scenario, however it's important to understand what will be unique about the C-17 capability and how it compares in significant performance characteristics to the C-5B, currently the only US outsize cargo airlifter.

Dr. Milton J. Minneman, a member of the staff of the Under Secretary of Defense for Research and Engineering, recognized the need to describe the airlift requirement in terms that went beyond the MTM/D equation. In a spring 1985 unpublished analysis, he compared the throughput capability projected for the C-17 and the C-5B. The analysis was based on off-loading at two airfields of differing sizes: one that Dr. Minneman viewed as a medium-size airfield with a ramp area of one million sq ft and one he considered a small-size airfield with a ramp area of 185,000 sq ft. The advantages of the C-17 accrued as a result of its

Figure 1
C-17/C-5 Productivity Comparison



ability to carry cargo efficiently to a wide variety of airfields. Its size, payload, backing turns, agility in parking, and ground times translate into greater cargo "throughput," measured in tons per day moved into an airfield (Figure 1).

Using a standard ground time of 2.2 hours for the C-17 and 3.2 hours for the C-5 during offloading at the medium-size airfield, the C-17 was shown capable of generating 80 sorties per day delivering 3,840 tons, while the C-5 could deliver 2,070 tons, or 46% less. The standard ground time assumes the aircraft engines are shut down and the crew accomplishes ground duties such as filing flight plans and taking meals. Minneman notes that the entire planned inventory of 180 C-17s did not require all one-million sq ft of ramp. Additionally, using Minneman's mathematics, one finds that the C-17 could also deliver this 3,840 tons of cargo into a ramp area of only 685,000 sq ft, since the limiting factor is numbers (180) of aircraft. If the C-5s were limited to the same 685,000-sq-ft ramp, they could be expected to deliver only 1,380 tons, or 64% less.

The advantages of the C-17 are more pronounced when Minneman uses a 185,000-sq-ft small airfield for the comparison. Because of the limited ramp space, both aircraft would remain on the ground the shortest possible time and, therefore, offload with engines running and crews remaining at the aircraft. This procedure reduces the ground times considerably to 0.5 hours for the C-17 and 0.75 hours for the C-5. Minneman's calculations using the small airfield show that the C-17 would be able to generate 95 sorties per day, and deliver 4,560 tons, whereas the C-5 could provide only 24 sorties per day, delivering 1,656 tons. If during the engine-running offload of cargo, kneeling and unkneeling the C-5 are required, an additional one-half hour must be added to the ground time. The added time decreases the number of sorties the C-5 can generate into the small airfield, and subsequently the tons of cargo delivered drops to 966, nearly 80% less than the C-17.

In addition to making very efficient use of available ramp space, the C-17 carrying outsize cargo will be able to get into small airfields with runways only 3,000 ft long and 80 ft wide, and taxiways as narrow as 50 ft. With the operational capability to back up a two-degree slope carrying its maximum payload, the C-17 will be extremely maneuverable in confined spaces, able to turn 180 degrees in 80 ft. This small-field capability enables the C-17 to deliver cargo directly to where it's needed and eliminates having to reload cargo onto C-130s for transshipment forward. But when the discussion is limited to achieving 66 MTM/D, the increased capability in terms of factors affecting military utility like runway length, taxiway width, maximum number of aircraft on the ground, ramp size, and runway width do not play as boldly nor does the capability represented by the C-17 emerge as dramatically. In other words, without considering all the

parameters involved in moving cargo, the picture lacks realism and, as was mentioned before, any long tube with wings will do. Within the context of a plausible combat scenario, the C-17 becomes an even more credible contributor to achieving the total airlift requirement.

LTV Corporation's Corps Tactical Airland Battle Simulator (Corps-TABS) provided Douglas Aircraft Company a wargaming model for a computer airlift simulation, contributing extensive airlift modeling and combat simulation to describe the benefits of various airlift options in a wide range of scenarios. Such wargaming illuminates the value of the options in terms of the effect each has on the course of the battle. Early airlift of heavy firepower can take advantage of favorable defensive terrain to slow enemy progress until more reinforcements can arrive, thereby denying enemy combatants the opportunity to gain new territory which must ultimately be recaptured.

Success or failure turns on the speed with which US forces can be brought to bear. This may sound too obvious; however, remember the capability to deploy forces rests not only on total forces available and the lift to move those forces, but on the ability to use the runways and ramps available in the objective area. Forward delivery is critical to getting there in time to make a difference. As an enemy moves forward and captures friendly airbases, the capacity for resupply and insertion of fresh troops diminishes, regardless of the size of friendly forces or the ability to employ them. With a limited number of suitable airfields available, Southwest Asia is a region where this is particularly true.

Iran Scenario

Typical of a crisis scenario in Southwest Asia is one in which the US deploys troops in response to a Soviet military incursion into Iran from the north over the Turkestan and Transcaucasus borders and from the east through Afghanistan. The Soviets could be prompted to such an action by a general disintegration of the Iranian government and a request by communist antigovernment factions for Soviet intervention. A similar circumstance was described by Marshall Lee Miller in his January 1987 *AFJ* article "The Soviet General Staff's Secret Plans for Invading Iran." Michael Gordon, in a December 14, 1986, *New York Times* article, "A 1980 Soviet Test: How to Invade Iran," also discusses Iran as a possible target for Soviet incursion.

Once committed, the Soviet forces in the scenario would move to secure Tehran and Northern Iran and then proceed south to occupy the remainder of central Iran. Two Soviet divisions from Afghanistan would advance on the port city of Bandar Abbas. Analyses done using LTV's Corps-TABS modeled a total Soviet force of 23 divisions in three armies and one corps, which would be needed to invade and control Iran effectively. (The scenario described is a subjective representation used as background in studying various notional airlift requirements and is not in any way associated with current DoD contingency plans nor is it a forecast of future events. It is solely a hypothetical vehicle to evaluate airlift capabilities and airlift's contribution to land battle effectiveness.)

The formidable task facing a US military force sent to challenge the Soviets is to deploy enough men and equipment in a short enough period of time to blunt the Soviet advance with the least amount of ground lost. The computer wargame mentioned above employs seven divisions to meet the Russian force: two mechanized, one airborne, one air assault plus aviation brigade, one infantry, one armor, and one Marine Amphibious Force (MAF). Most analyses of the effort to turn back a Soviet invasion see two defense strategies:

- the Zagros Defense, stopping the Soviets short of the Zagros Mountains;
- the Northern Defense, stopping the Russian advance north of Kashan (Map 1). In his book *Arms and Oil: U.S. Military Strategy and the Persian Gulf*, Thomas McNaugher described a similar Iran scenario and suggests that the US would deploy a comparable size, although lighter, force. McNaugher's conclusion, based on the current capability of airlift, was that the Zagros Defense is the only reasonable alternative, albeit a most undesirable one.

Few regions of Iran where combat is likely to occur are flat enough to accommodate rapid movement of men and equipment. Avenues

for maneuvering armor and mechanized units generally run south to north, and vary in width from 25 km at the narrowest in the north to 100 km at the widest in the south. The further south the US engages the Soviet force, the wider the area of contact, and the more difficult it is to maintain a defense in depth. Ideally, the strategy would be to meet the enemy as far north as possible to decrease his opportunity to maneuver. But before any discussion of where to meet the Soviet Army takes place, there must be some assurance that suitable US forces will be delivered in time to make a difference.

To better appreciate what the C-17 contributes to this typical scenario, the AMP's Option C and Option D are compared. Option C achieves the long-range ton-mile requirement by adding 156 C-5Bs; Option D achieves the overall airlift requirement by adding 180 C-17s, which adds a capability for direct delivery of outsize firepower to small austere airfields. Corps-TABS and the Douglas simulation effort provide substantive and valuable data for analyzing the contributions of each of the options.

In the scenario, the simulated closure of US forces was predicated on the sealift deployment of the first mechanized division (fast sealift), the armor units, and the MAF. Airlift of the three additional divisions of ground combatants would be delayed, since the first six days of the airlift requirement would be devoted to positioning Air Force units. Without sufficient airlift, the second mechanized division would be delivered by sealift. However, including Options C and D allows planning for airlift of the second mechanized division as well.

Those units arriving by sea are limited to the port facilities at Bandar Abbas; airlifted units deploying on airlift aircraft in the inventory, even with the additional C-5Bs in Option C, are limited to major airfields. Inclusion of the C-17s makes direct delivery to smaller secondary fields available (Figure 2). Esfahan, typical of a primary airbase, has two parallel runways nearly 14,500 ft long and 50 ft wide, with 75-ft-wide taxiways and approximately 1.8-million sq ft of ramp space. Nain Military, a secondary field, has a single 4,600-ft-long, 80-ft-wide runway; one 60-ft-wide taxiway; and only 68,500 sq ft of ramp space. The C-17's ability to land and maneuver on a runway only 80 ft wide makes a field like Nain Military a viable option for direct delivery of troops and outsize equipment—a capability not now available. Another example of a secondary type airfield is Kashan, with a graded earth runway over 7,000 ft long, but only 120 ft wide with limited turnaround area.

Data From Douglas/LTV Modeling

If the Zagros defense is selected (or by default becomes the only alternative), Bandar Abbas and Kerman are the deployment main operating bases from which, if possible, suitable materiel can be transshipped forward by C-130. AMP Option C does not include the C-17; therefore, deploying forces cannot land at Darab in addition to Bandar Abbas and Kerman. In the LTV model, the first engagement takes place along a line just north of Kerman. Overland movement of nearly 500 km is required to get outsize, heavy, self-propelled artillery and tanks to the Forward Line of Troops (FLOT) for the initial battle. That means the mechanized division arriving by Option C air-

Figure 2

Iran Scenario: Available Airfields

AIRFIELDS	ZAGROS DEFENSE Option C	ZAGROS DEFENSE Option D	NORTHERN DEFENSE Option C	NORTHERN DEFENSE Option D	AUTARIK AIRFIELDS C-5 or C-17	AUTARIK AIRFIELDS C-17 or C-130
BANDAR ABBAS	•	•			•	
KERMAN	•	•			•	
DARAB		•				•
ESFAHAN			•	•	•	
YAZD			•	•	•	
KASHAN				•		•
NAIN MILITARY				•		•
YAHJIATI	•	•	•	•	•	
KHORRAMABAD		•		•		•
ABADAN*					•	
SHIRAZ*					•	

*Available for airlift operations for other defense should they be needed.

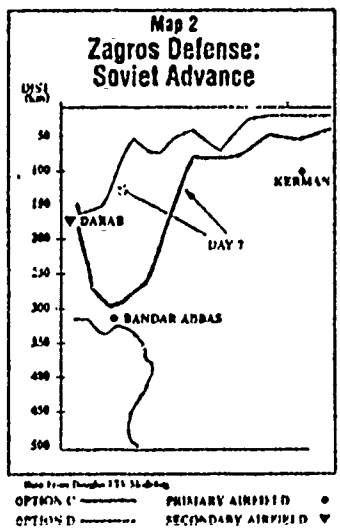
lift (and that by fast sealift) at Bandar Abbas has an arduous road march before it can engage the Soviet force. If the second mechanized division deploys by conventional sealift instead of airlift, nearly one-half of its capability is still at sea when the first shots are fired.

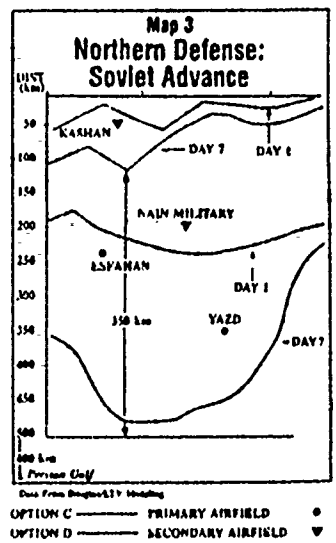
However, including C-17s in the scenario (Option D) allows flowing the second heavy mechanized division resources into Darab, with its narrow runways and limited ramp space. The C-17 also allows direct delivery of airborne and air assault helicopter units into Khorramabad, an austere field located in a high valley, enabling US forces to put pressure on the Soviet western flank. This option places heavy firepower in position with a much smaller portion of the total force left to close when the fighting begins.

When Corps-TABS was run simulating the airlift operations, the results were fairly consistent and demonstrated a significant difference in the two options with regard to maintaining the defensive line of battle. Map 2 shows the simulated FLOT for the two options following seven days of fighting just north of the Zagros Mountains, and illustrates the advantage of the ability to position heavy firepower rapidly, thus denying the enemy the opportunity to advance on Bandar Abbas and the Persian Gulf. Option D allows for a penetration of only 160 km, whereas Option C allows an enemy advance of nearly 300 km beyond the initial line of battle, to the outskirts of Bandar Abbas.

Should a northern defense be a viable battlefield alternative, the option with the C-17s pushes the line of initial contact north of Kashan. Kashan becomes available (initially) as does Nain Military for direct delivery of US forces. Inclusion of the C-17 permits earlier positioning of the kind of US fighting units capable of using the terrain to advantage, establishing an effective defense, and holding the Soviets north of where they can conduct operations in open terrain. US forces retain airbases vital to the continued war effort. The Soviets do not gain forward airfields from which they can easily threaten ports and airfields on the coast of the Persian Gulf.

Without the advantage of the C-17, at the beginning of hostilities the FLOT is a line running east-west nearly 150 km north of Nain Military. Compaing the FLOTs after seven days of battle for both Options C and D (Map 3), penetration by the Soviet forces with the





airlift capability of Option C (C-5) is roughly two and one-half times greater than with Option D (C-17). Not being able to abate the Soviet advance early in an area where terrain is narrow and advantageous resulted in United States' forces having to fight where defense in depth is more difficult. As a consequence the Soviets penetrated 350 km deeper. One secondary and two primary airfields are lost in the computer simulation, and the Soviets gained these facilities to conduct air operations from Central Iran.

Responding to an April 1984 request from Dr. David S.C. Chu, Director of DoD's Office of Program Analysis and Evaluation, the Military Airlift Command used the M-14 Worldwide Airlift Simulation Model to evaluate the productivity of various future airlift options. Those data were provided in May 1984 in a report called *A Comparative Analysis of Airlift Master Plan (AMP) Force Structures*. MAC compared the AMP Options C and D in a typical Southwest Asia scenario, but looked more closely at factors peculiar to the airlift system, such as maintenance limitations, timeliness of cargo delivery, diversions for airfield saturation, and the consequent impact of cargo's being located somewhere other than where it was intended. In addition to the timely direct delivery of troops and heavy firepower, MAC's computer simulation model turned up several other benefits that accrue from Option D in a Southwest Asia scenario.

MAC concluded that the C-17 represented a significant qualitative advantage in deploying cargo to the intended location in a timely manner. MAC learned that in an unconstrained deployment there was significantly less cargo malpositioned and there were far fewer diversions when the C-17 option was used. Additionally, they judged, "Option C (C-5s only) requires approximately 1.5 times as many maintenance specialists to sustain this level of activity as does Option D with its mix of C-5 and C-17 aircraft." The latter point could be true regardless of the scenario or region of the world simulated.

In conclusion, the reasoning on which the C-17 procurement is based is compelling. Regardless of the scenario or model used, if the enemy advances at a rate that varies with the amount of resistance (terrain or opposing force) the enemy force meets, then moving US forces to a position where they represent greater resistance will impede the enemy's advance. Because the C-17 allows US forces to encounter the enemy closer to the enemy's line of advance, the velocity at which the enemy moves forward is reduced.

Though the advantages of the C-17 in the Iran combat simulation are substantial, the same capability can be demonstrated when modeling the C-17 contribution in other combat environments, where rapid deployment and the benefits of direct delivery are critical to the outcome of the engagement. Achieving the 66 MTM/D airlift goal is an important part of the total airlift equation, but critics of the C-17, who look at the long-range mission with little attention to the other parts of the puzzle, are much like the blind man attempting to describe an elephant by touching its trunk.

"Force Reductions: Where To Look Before Leaping" by Greg Weaver. Military Forum 5, no. 8 (June 1989): 31-34.

- Thesis: Arms control negotiators must balance sustainability and strategic lift requirements when considering conventional force reduction agreements.

- Background

  -- The NATO and Warsaw Pact security alliances began new negotiations on reducing conventional forces in Europe (CFE) in March 1989.

  -- Both sides have exchanged proposals designed to achieve quantitative parity at levels below those now held.

  -- Economic and political conditions suggest that a CFE agreement could be reached quickly.

  -- NATO experts have analyzed such issues as force generation, force-to-space ratios, and force ratios within subregions.

     --- Further analysis is urgently needed of CFE impact on NATO's sustainability and strategic lift.

- Current NATO Sustainability

  -- US forces are generally well short of the modern munitions objective of 45 days.

     ---- So low on air-to-air missiles could exhaust supply in one or two weeks.

  -- The US has most items for war reserve kits but few assets to satisfy demands beyond initial 15 or 30 day period.

  -- NATO allies are worse off across the board.

- Current NATO Strategic Lift Capability

  -- The US is committed to providing 10 divisions and 60 tactical air squadrons to NATO in 10 days.

     --- Includes 6 divisions from US which have heavy equipment prepositioned in Europe.

-- A congressionally mandated mobility study identified an airlift requirement of 19,000 tons a day to Europe. All MAC assets and entire civil reserve air fleet of 670 aircraft can only lift 13,700 tons a day--a 28 percent shortfall.

-- Reinforcement and resupply of Europe would require about 800 shiploads per month with Western European countries requiring 1500. US and NATO allies can put only 950 ships to sea.

-- Strategic airlift capability will improve with C-17, but US and Western Europe flag merchant fleets will decline by 10 percent a year.

- Implications of CFE Proposals on Sustainability and Lift.

  -- Reductions in tanks, artillery and armored infantry vehicles on both sides reduces NATO sustainability requirements but increases strategic lift requirements.

     --- A reduction of total targets and the increase in warning time available to begin resupply from the US by sea would lessen the requirement for artillery and anti-armour munitions.

     --- If NATO's required equipment cuts were taken from US forces, the sealift requirement would increase to return this heavy equipment.

     --- If only US personnel were withdrawn and equipment was left prepositioned, NATO's airlift requirement to carry the withdrawn personnel back to Europe would increase.

- Improving Sustainability with CFE Provisions

  -- Limit forward deployment of large logistics stockpiles by Warsaw Pact.

  -- Increase unambiguous warning time through verification measures.

- Reducing Strategic Lift Shortfalls with CFE Provisions

  -- Increasing warning time would allow for a head start on shipping reinforcements and supplies.

  -- Increasing relative role of European ground combat forces.

--- Currently European reservists provide combat service and combat support functions for US combat divisions supporting NATO.

--- NATO could take reductions in combat forces through withdrawal of US combat personnel and replace them with US support units not subject to CFE limitations. Then NATO reservists currently assigned to support US combat units could be formed into rapidly mobilizable combat units.

-- Trade NATO tactical aircraft for Warsaw Pact ground forces.

--- Tactical air units can be deployed more rapidly and with much less strategic lift than US ground forces.

Lt Col Larry Radov, USAF
Irene Pearson-Morrow, ed

FORCE REDUCTIONS: WHERE TO LOOK BEFORE LEAPING

Arms control negotiators need to balance sustainability and strategic lift requirements when considering conventional force reduction agreements.

BY GREG WEAVER

In March, the 23 nations that comprise the NATO and Warsaw Pact security alliances began new negotiations on reducing conventional forces in Europe (CFE). Since that time, the two sides have exchanged opening proposals, and each has released a set of data that purportedly reflects its view of the quantitative balance of military power in Europe. Their differences, while significant, are surprisingly modest in the context of past conventional arms talks. While they may not agree on definitions and counting rules, both sides have proposed reductions designed to achieve "quantitative parity" in the offensive weapons at levels moderately below those now held by the side with fewer arms in each category.

The relative compatibility of the two sides' opening positions, and the increasingly apparent convergence of economic,

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political and demographic imperatives for a restructuring of the military balance in Europe, suggest that a CFE agreement of some kind could be reached quickly. Some have proposed that Soviet General Secretary Gorbachev's promised unilateral force withdrawals be incorporated into the CFE agreement, thus envisioning at least an interim accord before the scheduled completion of those reductions by 1991. Given Gorbachev's propensity to agree to Western proposals deemed non-negotiable by many in the West, such an accord could look very much like NATO's opening position and might be concluded in record time.

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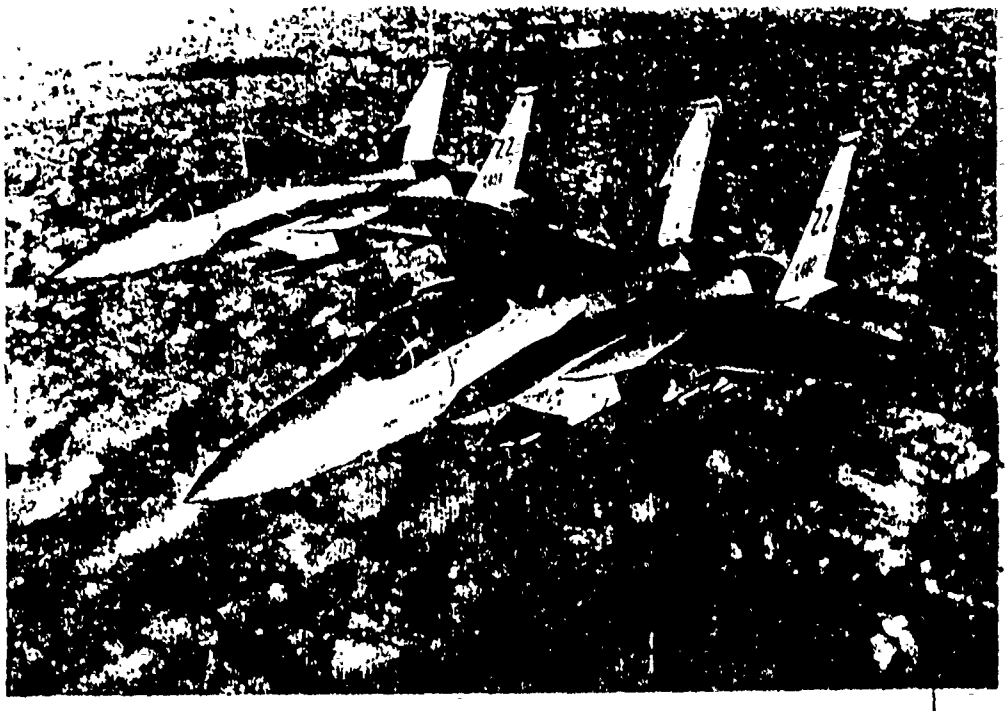
This potential for the relatively rapid conclusion of a CFE treaty creates an urgent need for detailed analysis of the implications of such an agreement for Western security. NATO analysts have already spent considerable time and effort examining proposed and potential CFE-reduction regimes, primarily emphasizing such issues as force generation, force-to-space ratios and force ratios within subregions of the overall Atlantic-to-the-Urals zone covered by the talks. Their analyses have served the Western alliance well, and the NATO opening proposal properly reflects their results. As a result, NATO entered the talks with an excellent position from which to start negotiating.

Further analysis is urgently needed, however. The outcome of a conventional war in Europe would be a function not only of arsenals and force structure, but of myriad operational considerations. The implications of various conventional arms control regimes for war outcomes are dauntingly complex, and relatively few of these complexities have been adequately studied in the analyses conducted thus far. If NATO is to make the most of the opportunity the CFE talks offer and avoid the pitfalls those negotiations present, it must go even further beyond "bean counting" in formulating its negotiating positions and assessing those of the Warsaw Pact.

Two areas in particular demand more detailed attention by Western analysts: the implications of potential CFE agreements for NATO's sustainability and strategic lift capabilities and the consequent implications of NATO's sustainability and strategic lift capabilities for the CFE negotiations. Sustainability and strategic lift constitute current NATO vulnerabilities that could be either dangerously exacerbated or significantly alleviated by a conventional arms control agreement.

While a detailed analysis of this issue is urgently required, some insight into how to approach these issues in the negotiations can be gained by briefly reviewing where NATO sustainability and strategic lift capabilities stand today.



If U.S. tactical aircraft, including these F-15 "Eagles," were withdrawn from Europe in exchange for Soviet ground force cuts, the geographic reinforcement disparities between the the two sides would be minimized because of the rapid deployment capability of such air units, the author contends.

McDONNELL DOUGLAS PHOTOGRAPH

Sustainability describes the relative capability of a nation to supply its forces with the materiel needed to conduct military operations over time. Often measured in "days of supply" of materiel—ammunition, fuel, spare parts and replacement equipment and so on—sustainability also includes the capability of logistical forces, such as combat support and combat service support units, to deliver needed supplies to the right place at the right time.

Strategic lift commonly refers to the ability to move conventional forces and supplies over intercontinental distances. It includes both air- and sealift capabilities. NATO's strategic lift requirements are primarily focused on delivering reinforcements and supplies based in the United States to Europe by air or sea. The United States is committed to providing 10 Army divisions and 60 tactical air squadrons for the conventional defense of NATO in 10 days. This includes delivering six divisions from the United States in addition to the four-plus U.S. divisions stationed in Europe in peacetime. To make such rapid delivery possible, the U.S. military has prepositioned in Europe much of the heavy equipment for those six reinforcing divisions, requiring only that the personnel and light equipment for those units travel to Europe by air.

Both sustainability and strategic lift are critically important to NATO's ability to deter—and, if necessary, wage—conventional war in Europe. In the event of such a war, Soviet military doctrine currently calls for the rapid conventional defeat of NATO forces before large-scale reinforcement from the United States could arrive, or a NATO decision to escalate to the use of nuclear weapons could be made. Severe NATO sustainability deficiencies could lead the Soviets to conclude that NATO's conventional defense would rapidly collapse due to lack of supplies, regardless of the size and quality of Western forces. Similarly, NATO strategic lift shortfalls could convince the Soviets that U.S. reinforcement efforts would deliver too little too late to prevent a quick Warsaw Pact conventional victory. Thus, sustainability or strategic lift deficiencies could contribute to the outbreak of war by reducing the deterrent effect of NATO'S conventional posture.

Unfortunately, NATO is deficient in both sustainability and strategic lift, although it is unclear how big a problem it is. Unclassified data showing the extent of NATO's sustainability and lift shortfalls are hard to come by, but some indicators are in the public domain.

In a 1988 paper submitted to the congressionally mandated conventional defense study group, for example, Charles Groover, director of the logistics and crisis management division of Systems Research Applications Corp., summed up the approximate state of U.S.-NATO sustainability. He noted that U.S. forces are "generally well short of the modern munitions objective" of 45 days supply. In addition, he pointed out that while troops probably have 60 days' worth of many older munitions, there are shortfalls of some types and that the forces are "so low on such items as air-to-air missiles that we would probably exhaust our inventories within a week or two." Finally, he claimed that while the U.S. forces have most of the assets available to fill the prescribed 15- or 30-day war reserve spares kit requirements, they had "very few assets of most items to satisfy the demands that would be encountered beyond that initial period."

More disturbing was Groover's description of allied sustainability: "The NATO allies are, almost across the board, significantly worse off than we are," he said. Referring to the lack of credible data on the allies' stockage postures during the time he was a Defense Department official, Groover wrote: "Politically, the allies were reluctant to provide candid data on their sustainability postures because they were almost certainly embarrassingly meager, and they knew that the United States would increase its already consistent pressure on them to buy more."

He concluded by noting that while progress had been made in adopting standard NATO munitions consumption rates and other standard reporting criteria, "I have no reason to believe that the NATO allies' reluctance to buy adequate war reserve inventories has disappeared."

NATO's sustainability shortfalls were perhaps most dramatically brought to public attention in the mid-1980s when then-Supreme Allied Commander, Europe Gen. Bernard Rogers repeatedly stated that NATO could fight conventionally for no more than a week to 10 days before he would be forced to request the authority to use nuclear weapons to halt a Warsaw Pact conventional assault. Although a number of factors led Rogers

to that conclusion (including the requirement to conduct NATO's conventional defense as far forward as possible), allied sustainability shortfalls were a major cause for his pessimistic estimate.

What about strategic lift? In 1981 the congressionally mandated mobility study (CMMS) sought to determine what improvements were necessary in U.S. strategic lift capability. The CMMS identified an airlift requirement of 19,000 tons a day to Europe. Despite the fact that many view the CMMS airlift requirement as dramatically understated, U.S. Transportation Command officials have said publicly that the U.S. Air Force's Military Airlift Command, in concert with the entire civil reserve air fleet of 670 commercial aircraft, can lift approximately 13,700 tons a day to Europe. That leaves nearly a 28 percent shortfall in strategic airlift. And the strategic sealift picture is worse.

In 1988, retired Navy Adm. Lee Baggett, then U.S. commander in chief, Atlantic (Cinclant), said that the reinforcement and resupply of Europe would require "about 800 shiploads per month," with another 1,500 transits a month required to support Western European countries. To meet this requirement, the United States and its NATO allies together can put roughly 900 to 950 ships to sea. Thus, launching a full-scale reinforcement and resupply effort would leave Europe with at most 10 percent of its required economic shipping available.

Unlike future prospects for airlift, which may be considerably improved by U.S. acquisition of the C-17, the sealift picture grows darker the further one looks into the future. According to Baggett, U.S. and Western European flag merchant fleets are shrinking at a rate of about 10 percent a year as a result of market forces.

Nor would the effects of a war on peacetime NATO sealift capability make a less gloomy outlook there. In the early 1980s retired Navy Adm. Ike Kidd, then U.S. Cinclant, estimated that in the initial wartime shipping surge NATO shipping losses could reach 50 percent.

The current state of NATO sustainability and strategic lift is sufficiently poor in relation to stated requirements to call into question the alliance's ability to conduct a successful conventional defense against a Warsaw Pact attack. Given that fact, two general questions face NATO

The same CFE agreement that might reduce NATO's in-theater sustainability requirements could significantly increase strategic lift requirements.

policy-makers who must make decisions regarding the West's position in the CFE negotiations: What effect would various CFE proposals have on NATO's sustainability and strategic lift requirements and capabilities, and how can a CFE agreement be shaped to improve NATO's capability in both areas relative to the Warsaw Pact?

In their opening CFE negotiating positions neither side proposed specifically limiting sustainability or strategic lift. However, the force reduction proposals of both alliances could significantly affect NATO's sustainability and strategic lift requirements.

The reduction of the conventional forces of the two alliances to quantitative parity at levels marginally (between 5 percent and 15 percent) below current NATO levels could have a variety of effects on NATO sustainability requirements. Those effects would depend on what was reduced and how those reductions were defined.

For example, if the reductions were limited to tanks, artillery and armored infantry vehicles and required very significant Soviet withdrawals (or destruction) of those systems from both the central region and the Atlantic-to-the-Urals zone (as NATO currently proposes), total NATO in-theater sustainability requirements for artillery and anti armor munitions would be reduced. This would result from both a reduction in the total number of targets for such ammunition and the likely increase in warning time available in which to begin the resupply of Europe from the United States by sea.

The same CFE agreement that might reduce NATO's in-theater sustainability requirements could significantly increase strategic lift requirements, however. For example, if NATO's required tank, artillery and armored infantry vehicle cuts were taken from U.S. forces now deployed in West Germany and the U.S. equipment withdrawn to the United States, NATO sealift requirements would increase significantly (assuming the United States planned to return those forces to Europe in the event of war). If, however, the CFE treaty permitted NATO to make part of its required reductions by withdrawing only the U.S. personnel from existing active-duty units in West Germany--leaving their equipment in prepositioned storage in Europe—NATO's airlift requirement to carry the withdrawn personnel back to Europe would increase, while sealift would be for the most part unaffected.

It is important to keep in mind that, given NATO's existing sustainability and strategic lift shortfalls, marginal reductions in either sustainability or lift requirements might have little or no additional deterrent effect. For example, if the level of sustainability necessary to provide a robust conventional deterrent and raise the nuclear threshold is thought to be 30 days and a CFE agreement raises the aggregate NATO allied level of sustainability from seven days to eight days, the deterrent effect of the sustainability improvement may be insignificant.

Similarly, if it is necessary to deliver six additional divisions in 10 days and a CFE agreement cuts that lift requirement to five additional divisions in 10 days, the reduction in lift requirement may make little difference if our real lift capability permits us to deliver only two and a half divisions in that period. Of course, other effects of such an agreement, such as the reduction in Warsaw Pact forces and increases in NATO warning time could significantly enhance Western security

The examples cited above illustrate the kinds of implications a CFE agreement could have for NATO sustainability and strategic lift requirements that can only be sufficiently understood through detailed analysis. The other side of the coin also demands closer examination.

Because sustainability and strategic lift

are critical factors in determining NATO's ability to defend itself with conventional forces, both have significant implications for conventional arms control in Europe. NATO decision-makers and negotiators must not only take sustainability and strategic lift into account when evaluating potential CFE agreements, they should also explore the possibilities of improving NATO's relative sustainability and strategic lift postures through specific provisions of a CFE agreement.

One way to both improve NATO's relative sustainability posture and reduce the possibility of an effective short-warning attack by the Warsaw Pact would be to place strict limitations on the forward deployment of large logistical stockpiles. If the Warsaw Pact were considering an attack on NATO following the implementation of such constraints, it would face a dilemma. Either the Warsaw Pact would be required to redeploy its sustainability stocks forward before initiating an attack, thus violating the CFE treaty and providing clear warning of its intentions. Or it would have to launch its attack without supplies in place, thus forcing the pact to move massive amounts of fuel, ammunition and other supplies forward during the conflict (providing NATO aircraft with vulnerable, valuable targets in the process).

Unlike "offensive weapons free zones" proposals, which could prevent NATO ground forces from deploying in the most defensible terrain available in a crisis, limits on large stockpiles of forward deployed supplies should not adversely affect NATO defense efforts. Given NATO's defensive posture, it does not need to maintain large stocks close to the border. While verification of such limits on forward-deployed sustainability stockpiles might be very difficult through national technical means alone, adequate verification might be provided by a regime of pre-agreement declarations of existing stocks and on-site challenge inspections. These could be combined with constant post agreement monitoring by instrumentation, permanent observers or a combination of the two.

Other measures to increase the unambiguous warning time available to NATO would also enhance the alliance's sustainability posture vis-a-vis the Warsaw Pact. Such warning would permit NATO to disperse its in-theater stocks to reduce vulnerability to preemptive attack and begin the shipment of additional stocks from the United States before the outbreak of war. Thus, NATO planners should explore the possibility of increasing warning time through the measures proposed for the purpose of verifying compliance with agreed reductions in CFE. The placement of tamper-resistant sensors designed to detect illegal force redeployments is one example of this sort of measure.

NATO should also seek to avoid limitations in CFE that could exacerbate existing sustainability shortfalls. For example, limitations on prepositioning U.S. equipment in unit sets could reduce NATO sustainability by increasing strategic lift shortfalls. If more U.S. equipment had to be shipped to Europe by sea early in a conflict, critically needed ammunition and spares could be displaced.

CFE offers several opportunities to reduce NATO's chronic strategic lift deficiencies. As already noted, increased warning time would permit NATO to get a head start on shipping reinforcements and supplies by sea before combat losses would cut into the alliance's already deficient sealift capacity.

If CFE limits were structured so as to allow NATO to increase the relative role of European ground combat forces in NATO's defense, shortfalls in the ability to lift U.S. reinforcements and their heavy equipment to Europe could be reduced significantly.

For example, the United States currently deploys over four full combat divisions in West Germany. However, these units lack the necessary combat support and combat service support personnel they need to operate effectively in wartime. NATO plans to supply those needed personnel through host-nation support arrangements, which call for West German reservists to perform those vital support functions following mobilization. NATO also plans to heavily reinforce the central region, primarily with U.S. combat forces airlifted to meet up with their prepositioned equipment in Europe.

If through CFE NATO could take its required reductions in combat forces through the withdrawal of U.S. active-duty combat personnel (leaving their equipment prepositioned in Europe, but counting it as reduced), and replace the withdrawn U.S. combat units with U.S. support units not subject to limitation, then the German reservists currently assigned to support U.S. combat units could be formed into rapidly mobilizable combat units, also not subject to limitation. This would permit NATO to mobilize more combat forces at lower cost (in the form of German reservists) and support airlifted U.S. reinforcements with the

Military Airlift Command transports, like this C-5 "Galaxy," could when combined with a reserve fleet of commercial aircraft deliver approximately 13,700 tons a day to Europe—but that is more than 5,000 tons a day short of the airlift requirement.

DEFENSE DEPARTMENT PHOTOGRAPH

U.S. support units forward deployed.

If these steps were taken in concert with other CFE provisions that significantly increased NATO's unambiguous warning time, the airlifted U.S. personnel would likely be in place alongside well-armed German reservists and with their necessary support at the outset of a war. While such an arrangement might be difficult to pull off, it exemplifies the kinds of creative options a CFE agreement might provide.

Another CFE option that could result in cuts in Warsaw Pact forces without increases in NATO lift requirements would be to take the Warsaw Pact up on its offer to trade NATO tactical aircraft for Warsaw Pact ground forces. Such a trade need not be made literally, resulting in significant NATO numerical inferiority in in-place air forces. Numerical parity in both ground and air forces could be agreed on, with the air ceilings set low enough as to require significant reductions in NATO tactical air forces. In exchange for this, the Warsaw Pact would agree to highly asymmetrical ground force reductions that would greatly reduce both the short-warning and large-scale offensive threat posed to NATO.

If U.S. tactical aircraft were withdrawn in exchange for Soviet ground force cuts, while the bulk of U.S. ground forces remained in West Germany, the geographic reinforcement disparities between the two sides would be minimized. U.S. tactical air units can be deployed to Europe far more rapidly and with much less strategic lift than can U.S. ground forces.

NATO's opening position in the CFE negotiations is a good starting point. It is based on the principle of quantitative parity in those conventional armed forces most suited to the launching of offensive action into an opponent's territory: main battle tanks, artillery and armored infantry carriers. A CFE accord that resulted in quantitative parity in such systems would go a long way toward producing a stable conventional military balance in Europe. Yet such a treaty might not improve NATO security substantially if insufficient attention is paid to its implications for the sustainability and reinforcement capability of NATO military forces.

Numerical limits on weapons and combat force deployments are certain to be the centerpiece of a CFE accord. That is as it should be. But the weapons and forces to be limited and the magnitude and parameters of those limits must not be decided in an operational vacuum. It is particularly critical that we understand the effects of potential CFE outcomes on the reinforcement and sustainability capabilities of NATO forces, and to explore the possibilities for limitations on those capabilities of the Warsaw Pact.

Clearly the CFE negotiations present NATO with numerous opportunities and pitfalls in the area of sustainability and strategic lift. The examples laid out here are simply meant to illustrate the extent to which NATO security can be enhanced or damaged by the effects of a CFE agreement on NATO's sustainability and strategic lift capabilities. Only through detailed analysis of the relative capabilities of the two alliances to supply and reinforce their respective conventional forces can recommendations be confidently made regarding NATO actions in those negotiations. ★

"Deployment--Mobilizing and Moving the Force" by Graham H. Turbiville, Jr. Military Review (December 1988): 41-49.

- Thesis: Although the Soviets seem willing to accept fewer deployed forces, improvements and probable changes in deployment and mobilization systems may enhance their strategic deployment capabilities.

- Background

  -- Following WW II the Soviets focused on both the need for speed in mobilizing and deploying forces and the requirement for continuous force generation and movement throughout a conflict.

  -- The Soviets' view of strategic deployment in the early nuclear age pointed to the obsolescence of past approaches. Their view judged that mobilization and deployment should primarily be carried out ahead of time and merely completed in a period of threat.

- Current Soviet "Strategic Deployment" Approach and System

  -- During the 1980s, Soviet judgment on strategic deployment changed. It acknowledged meeting deployment requirements before the outbreak of a conflict was desirable. However, practical military and political considerations could prevent this.

  -- New principles stressed planning based on speed, secrecy, and deception. Planning was aimed at seizing the initiative by delaying or overtaking enemy mobilization, deployment, and combat actions.

  -- This quick-reaction mobilization system draws on the Soviet Union's large reserve military manpower base and both earmarked transport vehicles and equipment from the national economy.

  -- The pre-positioning of large stockpiles of ammunition, POL, and other supplies in forward areas is a key ingredient.

  -- Critical areas receiving emphasis since the 1970s include improving the road, rail, air and water transportation links and facilities essential for the movement of military units and material, and establishing hardened command posts and communication facilities for the control of theater forces.

- Future Soviet "Strategic Deployment" Considerations

  -- Soviet forces in the forward area, and perhaps forcewide, may be reduced as a consequence of

technological, operational, and conventional arms control developments.

-- The Soviet objective for strategic deployment has not changed and remains twofold.

--- They must create the required superiority in forces and means over the enemy in order to conduct successful initial strategic operations.

--- They must seize the strategic initiative, achieving victory in initial operations and thereafter by the commitment of forces arriving from the interior.

- Movement and Reinforcement

-- Present Soviet transport resources, even if limited, could reestablish sizable forces in the forward area in a short period of time through covert and overt means.

-- Soviet capabilities in strategic movement depends on all forms of transport-- rail, military transport aviation, inland waterways, and units marching under their own power and on heavy lift transporter units.

-- These means of fast and flexible strategic transport can deliver rested, combat-capable units to forward areas quickly.

-- This Soviet capability suggests that substantial conventional force reductions may well be acceptable to Soviet planners.

- Pre-positioning and Military Mobilization

-- Pre-positioning of equipment and supplies has always been part of Soviet mobility plans.

-- The positioning of newer, unit - configured equipment sets to be manned by troops moved into forward areas substantially reduces overall mobility requirements.

-- This mobilization system is intended to provide, within hours of notification, hundreds of thousands of reservists and equipment.

--- In a post-force reduction environment, initial covert mobilization of these reserve forces and more agressive training would be emphasized.

- Soviet Srategic Deployment Goals

  -- Options for meeting strategic deployment goals in a future environment shaped by new technologies, restructured forces, and conventional arms reductions are numerous.

  -- US negotiators must anticipate these options and factor their consequences into force and arms reduction agreements.

Lt Col John Dalton, USAF
Irene Pearson Morrow, ed.

Graham H. Turbiville Jr.

Soviet initiatives at the bargaining table calling for deep cuts in conventional forces may well be more than holl[illegible]y offerings. According to the author, recent Soviet writings and thinking on strategic deployment in particular indicate a willingness to accept fewer forward deployed forces. He also warns that improvements and probable changes in deployment and mobilization systems may allow them to maintain and even enhance strategic deployment capabilities.

THE TRANSITION of the Soviet armed forces from a peacetime to a wartime footing and the creation and concentration of combined arms groupings for the conduct of military operations are processes affected directly and fundamentally by evolving Soviet perceptions of the nature of future war. The complex of plans, preparations and resources integral to this process—which the Soviets designated "strategic deployment"—has undergone sweeping change over the past 30 years and could be substantially modified as a consequence of continuing technological change, large-scale force restructuring and conventional arms reductions in Europe.[1] In what now constitutes an extensive and growing body of material assessing the nature of strategic deployment for war, Soviet planners point to ways in which requirements for mobilizing and moving the armed forces have changed, and are changing, this "basic issue of strategy."[2]

Perceived Soviet requirements for strategic deployment needs in the first years after World War II were based on two major factors: first, those requirements that Soviet

planners associated with the difficult circumstances of surprise and lost initiative encountered at the beginning of the war; and second, the need to support the kinds of strategic combined arms operations that characterized, in particular, the last period of World War II. Beginning in the early postwar years, these lessons learned were set out in detail and focused on both the need for speed in mobilizing and deploying forces and the requirement for continuous force generation and movement throughout the duration of a conflict.[3] Further, the mobilization, concentration and movement of forces, together with the conduct of initial operations, came to "comprise a single inseparable process" captured by the term "mobilizational deployment."[4]

***[Soviet planners] stressed that strategic deployment planning and preparations must in all cases be founded on* speed, secrecy *and* deception, and aimed at seizing the strategic initiative through forestalling or overtaking enemy mobilization, deployment and combat actions.**

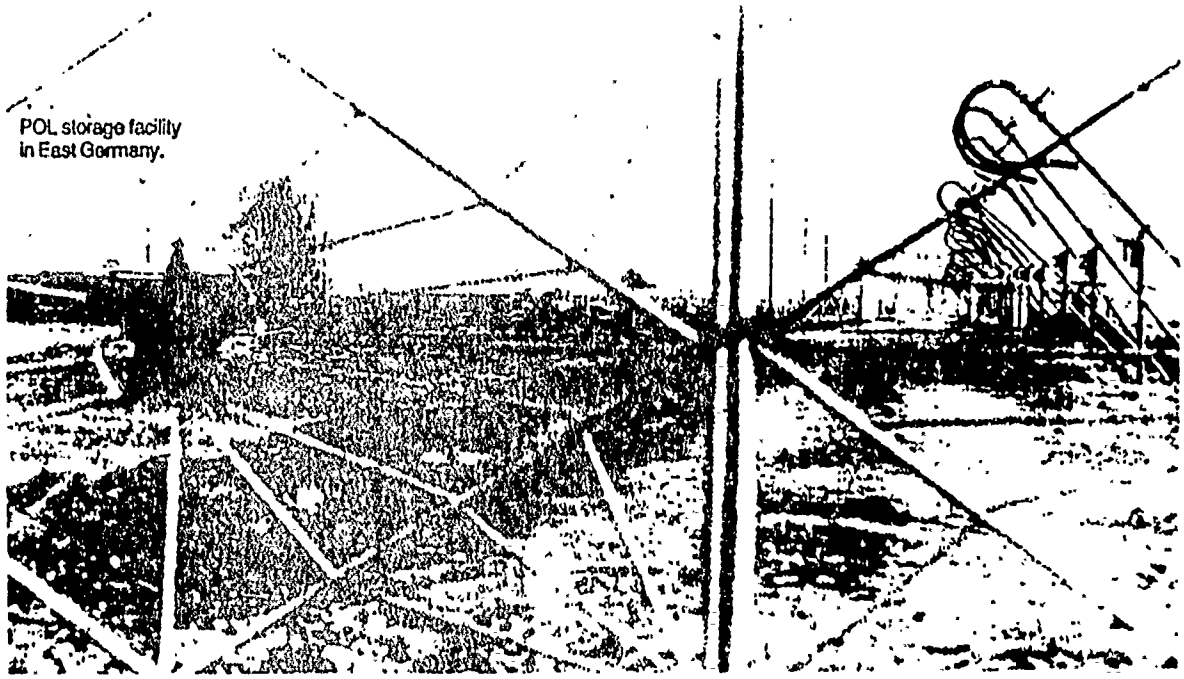
The "revolution in military affairs" engendered by the widespread introduction of nuclear weapons changed Soviet perceptions of strategic deployment requirements in the early 1960s. The almost exclusive focus by Soviet planners on nuclear conflict variants in this period reinforced the need for speed in mobilizational deployment, but emphasized the decisive role to be played by military operations conducted by force groupings already existing and largely deployed in peacetime. While the execution of some mobilization and deployment measures after the initiation of hostilities was certainly envisioned, the likelihood of early or surprise enemy nuclear attack on transportation and mobilization centers and the decisive nature of friendly nuclear strikes on enemy forces and facilities were thought to render these measures both problematical and less important. In addition, the likely short duration of a general nuclear war radically reduced the need for continuous force generation.[5]

This 1960's view of strategic deployment in the nuclear age was encapsulated by Marshal V. D. Sokolovsky's *Military Strategy*, which pointed to the obsolescence of past approaches and judged that mobilization, concentration and deployment measures could for the most part be "carried out ahead of time and merely completed in a period of threat."[6] Soviet strategic deployment planning and preparations in the 1960s were predicated on this view, which was reflected throughout military writings and large-scale exercises of the period, and by Soviet force organization and the military support infrastructure.

Current Soviet Approach and System

The Sokolovsky judgment on strategic deployment, noted above, was singled out for special criticism by Colonel General M. A. Gareyev in his 1985 book *M. V. Frunze—Military Theorist.*[7] Gareyev acknowledged the obvious desirability of meeting strategic deployment requirements before the outbreak of hostilities, but went on to cite the many practical military and military-political considerations that could prevent this. He and other Soviet planners stressed the need for a strategic deployment system that could deal with any conflict variant and that could meet the needs of the Soviet armed forces "under any conditions in which imperialist aggressors initiate war."[8]

Indeed, classified Soviet sources a decade earlier had already made precisely this point. These sources set out distinctions between strategic deployment in nuclear and nonnuclear war, and described approaches that would meet the specific, attendant features and difficulties associated with each variant.



POL storage facility in East Germany.

Beginning in the 1970s, the element of strategic deployment termed "preparing theaters of military action" received new attention. This process, which is continuing apace, takes many forms, but is ce .tered mainly on pre-positioning large stockpiles of ammunition, POL (petroleum, oils and lubricants), and other supplies in forward theater areas [plus] improving the road, rail, air, and water transportation links and facilities essential for the movement of military units and materiel.

They stressed that strategic deployment planning and preparations must in all cases be founded on *speed*, *secrecy* and *deception*, and aimed at seizing the strategic initiative through forestalling or overtaking enemy mobilization, deployment and combat actions.[9] These principles continue to govern Soviet approaches to strategic deployment and are reflected in current Soviet peacetime force structure, readiness and deployment, and in the preparation of theaters of strategic military action (TSMAs) around the Soviet periphery.

In regard to Soviet planning for operations against NATO generally, preallocated, forward-based tactical units and operational formations are deployed and maintained in peacetime at levels of strength and operational readiness adequate to undertake initial operations immediately, while lower strength/less ready forces in each TSMA are to be rapidly mobilized and deployed to fill out or reinforce operational groupings early in a conflict. The emphasis is on fielding large Warsaw Pact combined arms groupings rapidly on key strategic and operational directions. These forces are to be strong enough to repel an enemy surprise attack, cover ongoing operational deployment and rapidly undertake operations on a theater-strategic scale. Plans and preparations are made for the continued generation of forces—including the creation of new units—and the introduction of large strategic reserves of all types to sustain military operations for periods that may be protracted. In a nuclear war, such strategic reserves would be used largely to reconstitute severely reduced theater forces, while in a nonnuclear

conflict they would be intended principally to achieve the conventional force superiority necessary for achieving theater objectives.[10] Integral to the whole process is a quick-reaction mobilization system that draws on the Soviet Union's large reserve military manpower base and earmarked transport vehicles and equipment from the national economy.[11]

Given the extreme difficulty in interdicting [battalion-increment reinforcements] the substantial speed and inherent flexibility it possesses, and its ability to deliver rested, combat-capable maneuver units to forward areas, heavy lift units would likely receive even more emphasis in a post-reduction Europe.

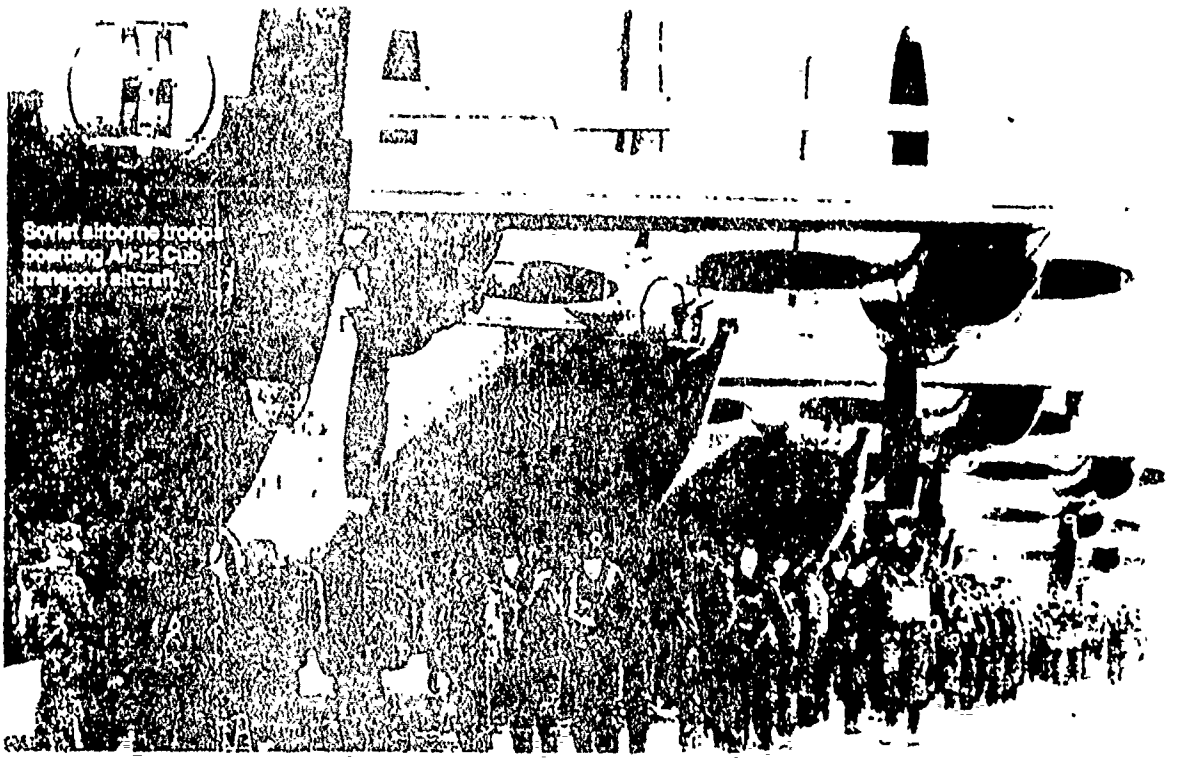
Beginning in the 1970s, the element of strategic deployment termed "preparing theaters of military action" received new attention. This process, which is continuing apace, takes many forms, but is centered mainly on pre-positioning large stockpiles of ammunition, POL (petroleum, oils and lubricants), and other supplies in forward theater areas; improving the road, rail, air, and water transportation links and facilities essential for the movement of military units and materiel; prestocking lines-of-communication repair and reconstruction materials; designating and preparing components of the Soviet and East European national economy (hospitals, repair facilities, and so forth) to support the military in time of war; establishing hardened command posts and communication facilities for the control of theater forces; and associated training and planning measures in the military and national economy that are all explicitly identified by the Soviets as integral to strategic deployment.[12] Clearly, the high commands of forces established in two of the three theaters facing NATO play an important role in strategic deployment, in that they are intended in part to facilitate the rapid transition of theater forces to a wartime footing.[13]

Strategic Deployment and Future Soviet Force Posture

There is a potential that Soviet forces in the forward area—and perhaps forcewide—will be reduced as a consequence of technological, operational and conventional arms control developments. The large-scale reduction of Soviet theater forces in Europe through any, or a combination, of these factors will unquestionably affect Soviet approaches to the strategic deployment of the armed forces in a number of respects. In judging what Soviet adjustments—or more radical changes—may be undertaken in regard to movement, mobilization and associated training issues, it is necessary to keep in mind, first of all, that despite changing Soviet perceptions of the nature of future war, the stated Soviet objective for strategic deployment in a theater conflict is twofold. That is, strategic deployment must ensure and provide for:

- Creating the required superiority in forces and means over the enemy in the TSMA, in order to conduct the initial strategic operations successfully.
- Seizing the strategic initiative, achieving victory in the initial operations and developing efforts by the commitment of forces arriving from the interior.[14]

Superimposed on these goals—which the weight of evidence to date suggests will remain unchanged over the next decade—is the continuing requirement to plan for the employment of nuclear weapons by the enemy and to meet the kinds of mobilization and deployment demands such employment would present. In addition, the perceived danger posed to transportation lines and facilities by precision-guided munitions already fielded, as well as those projected for future introduction, will continue to grow as a major Soviet planning consideration.



Soviet planning for strategic movement is predicated on the integrated use of all forms of transport. Rail will remain a critically important means of strategic movement in many circumstances and the continuing growth and capability of military transport aviation is significant in terms of transporting tailored motorized rifle or airborne light armored forces.

Movement and Reinforcement

Among the principal criteria for Soviet planners considering acceptable levels of conventional force dispositions would be the potential for establishing operational groupings capable of meeting the above requirements. While not minimizing the potential problems involved, Soviet planners judge that even limited Soviet transport resources—in a period of threat preceding war—could reestablish sizable combat forces in the forward area in a short period of time through a combination of covert and overt means.

Soviet planning for strategic movement is predicated on the integrated use of all forms of transport. Rail will remain a critically important means of strategic movement in many circumstances and the continuing growth and capability of military transport aviation is significant in terms of transporting tailored motorized rifle or airborne light armored forces.[15] Additionally, the potential of inland waterways and the water movement of forces along maritime axes is not insignificant from the Soviet planners' perspective.[16] The role and relative contributions of various types of transportation means have been examined and reexamined by Soviet planners in the 1970s and 1980s.[17] While all movement means have advantages and limitations, it is a Soviet perception that units moving by march, under their own power and with attached motor transport means, will be of critical importance. Indeed, it is a Soviet planning assumption that *all* units located in border military districts will move to the forward area by march.[18]

Strategic heavy-lift transporter units would be particularly important in this regard and their present capability serves to illustrate

this. That is, if approximately two-thirds of the 3,500 heavy equipment transporters now assigned to strategic transporter regiments were assigned to support the Western TSMA, any of the following force packages could be moved from the western Soviet Union to East Germany in 72 hours, or, perhaps, in less than half that time:[19]

- More than 50 tank or BMP-equipped motorized rifle battalions.
- Ten tank regiments or 10 BMP-equipped motorized rifle regiments.
- Two or three tank or motorized rifle divisions.
- One or two "new army corps" plus some 20 tank or motorized rifle battalions.
- Tens of thousands of metric tons of bulk supply items, such as ammunition, POL, and so forth.

The prospect of a limited—or perhaps sweeping—reorganization of Soviet maneuver units may focus Soviet attention further on small unit reinforcement options such as the option indicated in the first point above.

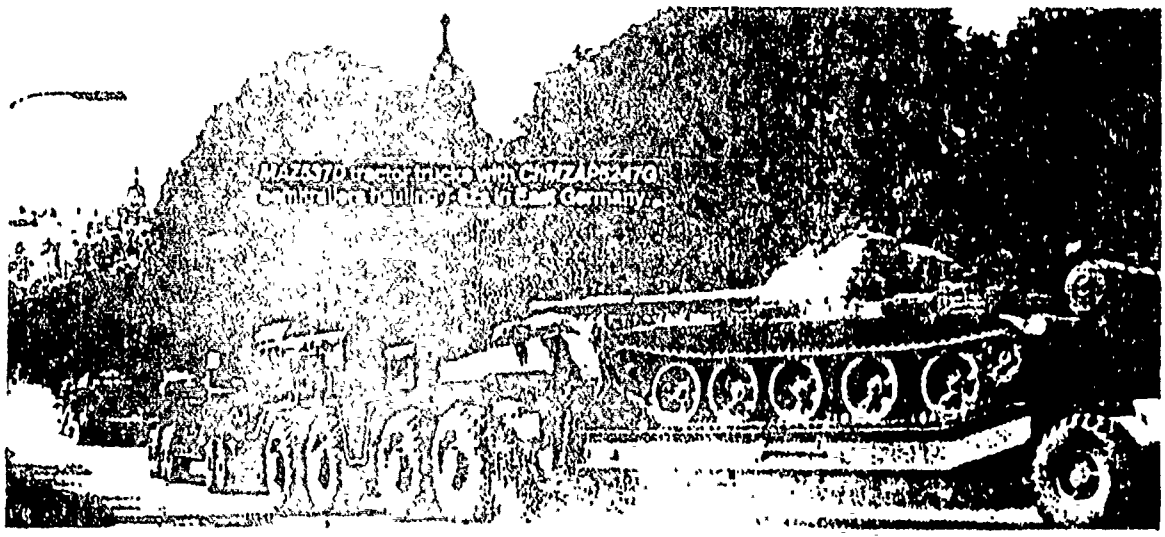
Even a superficial examination of Soviet capabilities in this regard, however, suggests that substantial conventional force reductions may well be acceptable to Soviet planners charged with evaluating approaches for reestablishing forward deployed force groupings in time of crisis or war.

That is, a Soviet force-restructuring effort centered on the creation of corps and brigades with subordinate battalions—as some evidence suggests may be underway—would further increase the utility of reinforcement by battalion increment, since the battalion would comprise the basic building block of larger tactical units and operational-tactical formations.

Given the extreme difficulty in interdicting this means of strategic transport, the substantial speed and inherent flexibility it possesses, and its ability to deliver rested, combat-capable maneuver units to forward areas, heavy lift units would likely receive even more emphasis in a post-reduction Europe. A substantial increase in the size of this strategic transport force could be made quickly and relatively cheaply. Thus, the potential for rapid reinforcement represented by this transport mode alone may give Soviet planners reduction and reinforcement options that are not immediately apparent to Western observers.

Dramatic increases in Soviet movement and reinforcement capabilities are possible in the near term as a consequence of new technological innovations. Soviet Lieutenant General M. M. Kir'yan and others have pointed to the potential of wing-in-ground (WIG) technology for the transport of large military cargos.[20] The Soviets underscore the speed, heavy loads and modest fuel consumption associated with low-flying WIG craft, as well as their capability to travel as easily over ground as water and to negotiate high obstacles. Combining the characteristics of aircraft and ships, these vehicles may be involved in the land and sea transport of both tactical units and materiel.

Overall, reinforcement potential by individual or integrated transport means will exercise a major influence on the size of conventional force reductions or reorganizations Soviet planners may consider and on post-reduction/reorganization military capabilities. Computer simulations designed to evaluate a spectrum of reduction variants and transport combinations are essential for better defining Soviet options and perspectives.[21] Even a superficial examination of Soviet capabilities in this regard, however, suggests that substantial conventional force reductions may well be acceptable to Soviet planners charged with evaluating approaches for reestablishing forward deployed force groupings in time of crisis or war.



It is a Soviet perception that units moving by march, under their own power and with attached motor transport means, will be of critical importance. Indeed, it is a Soviet planning assumption that all units located in border military districts will move to the forward area by march.

Pre-positioning

The pre-positioning of equipment and supplies, as noted above, is part of the Soviet approach to preparing TSMAs for the conduct of military operations. Its purpose, of course, is to minimize transport requirements in an environment of widespread interdiction, to minimize the many competing transport requirements associated with mobilization or war and to improve the speed of operational deployment and timely commitment of force groupings.[22] With major force reductions and the consequent requirement to rapidly reestablish operational groupings under the threat of enemy interdiction, pre-positioning in some respects would grow in importance. Currently, pre-positioned logistic stockpiles in TSMAs opposite NATO are capable of supporting many weeks of operations by the large theater combined arms forces now allocated to each theater. While the continued maintenance of these forward deployed stocks would be essential, their further increase would probably not be required should there be a post-INF Treaty reduction of maneuver and support units. However, the hardening and dispersal of some stocks to provide for their survivability would be desirable from the Soviet planners' perspective, as would the improvement of local transportation means to provide for their timely movement to field locations in a period of threat.

The pre-positioning of unit-configured equipment sets to be manned by troops introduced into the forward area could, of course, reduce movement requirements substantially. It is in this area that new Soviet pre-positioning initiatives would be most likely. There is ample precedent for the Soviets creating such force packages, and their extensive creation in connection with troop withdrawals may constitute an attractive Soviet option.[23] While maneuver unit equipment sets would clearly be good candidates for pre-positioning, it is probable that engineer, repair and technical support, medical and other support unit sets would be pre-positioned as well.

Military Mobilization System

The Soviet mobilization system is intended to provide—within hours of the notification of a general mobilization—hundreds of thousands of reservists and equipment items of all

The pre-positioning of unit-configured equipment sets to be manned by troops introduced into the forward area could, of course, reduce movement requirements substantially. . . . There is ample precedent for the Soviets creating such force packages.

types to units and formations throughout the armed forces. After bringing designated reduced-strength active units up to full strength and creating those immediately needed new units, the system would be focused on the continued generation and build-up of cadre and new units and the mobilization of reservists and equipment from the national economy. With substantial conventional force reductions in the forward area or the Soviet Union itself, adjustments to the mobilization system may also be forthcoming.

While speed, secrecy and efficiency in mobilization have always been emphasized, they would acquire a special character in a post-reduction environment. Additional emphasis would be placed on the initial, incremental, covert mobilization of forces, and a host of tailored *maskirovka* (deception) measures designed to disguise mobilization and deployment through their various stages. A number of Soviet sources have suggested what such measures might comprise.[14] Combined with a strategic deployment system designed for the surge generation of forces in a short period of time, the Soviet goal of "forestalling and overtaking" enemy strategic deployment might be achieved, even with a substantial reduction of forces in the forward area. Relative enemy mobilization and deployment capabilities are, of course, an explicitly noted element of Soviet calculations in this regard.[15]

Despite the obvious advantages of computer technology in the operation of military commissariats, Soviet literature suggests that computers are only now beginning to be employed in this role and not very effectively.[16] It is likely that new emphasis would be placed on fully automating the commissariat system, particularly in border military districts. Far more careful attention would be given to identifying military specialists and general troops required for early call-up, with those reservist personnel needed to constitute key combat and support units predesignated and periodically trained to an extent that greatly exceeds current standards. Special categories of highly trained reservists designated for early call-up would probably be created, and partial mobilization exercises would be held more frequently and be more demanding. The periodic movement of personnel and selected units to forward deployment areas in Eastern Europe and the border military districts would probably play a growing role in such exercises.

Reservist training overall—which according to some reports is uneven and often inadequate—would receive new emphasis, particularly if Soviet forces were reduced and not simply relocated. The reported poor performance of conscripts (and reservists) in Afghanistan suggests that preinduction training under DOSAAF—a Russian acronym for Voluntary Society for Cooperation with the Army, Air Force and Navy—may be upgraded as well, if a smaller force were to be more effective in the early stages of conflict.[17] Even recognizing the demographic problems involved, the prospects of reinstating a three-year term of service for some ground force conscripts may be considered. It is most unlikely that Soviet planners would accept today's levels of reservist and conscript training as adequate for a smaller force in the future.

Overall, there is a spectrum of Soviet options for meeting strategic deployment goals in a future environment shaped by new battlefield technologies, restructured forces, and conventional arms reduction. Soviet operational groupings with adequate levels of training could be rapidly fielded and committed—

even with substantial force reductions/relocations in forward theater areas. Such strategic deployment could be accomplished through a combination of existing and improved strategic transportation means, current pre-positioning practices and new initiatives centered on the creation of unit-configured equipment sets, and adjustments to the mobilization system and associated training measures. Similar options could be implemented in response to a broader Soviet conventional arms cut, in which Soviet units were not just relocated, but deactivated or placed in cadre status. Finally, while analogous measures could be undertaken to offset the deactivation of indigenous, non-Soviet, Warsaw Pact forces, it is probable that Soviet planners would look more closely at the contingencies existing in the mid-1960s, when the need to establish force groupings incorporating far less effective Warsaw Pact forces was preeminent in Soviet war planning. MR

CHAPTER III

ANALYSIS OF STRATEGIC MOBILITY

While the US maintains a significant capability in its strategic mobility triad, is that capability appropriate and sufficient? Recent international developments along with fiscal constraints have elevated the concern over whether our strategic mobility capability is sufficient. This final chapter analyzes the current elements of strategic mobility. The strengths and weaknesses of each leg of the triad are addressed in light of the changing world situation. Other relevant factors that are external to mobility but significantly impact it are also discussed. The analysis of all these factors leads to the conclusion that emphasis is still needed on improving US strategic mobility, especially for the future.

Strategic Mobility Triad

Emphasis is still needed on the elements of our strategic mobility forces and the organization that puts those elements into action. A closer look at recent world developments such as arms control discussions and the changing threat also demonstrates a continued need for this emphasis. First an examination of issues related to airlift, sealift, and prepositioning is necessary.

Airlift Shortfall

The US has a commitment to provide 10 divisions and 60 tactical fighter squadrons in 10 days for the reinforcement of NATO, but it could not meet that requirement in 30 days. If the requirement were translated into million ton-miles per day (MTM/D), some mobility experts would estimate it from 125 to 150 MTM/D.[1] The airlift needed to reach other theaters, such as 98 MTM/D for Southwest Asia, also exceeds the fiscally constrained goal of 66 MTM/D.[2]

With the current capacity at 49 MTM/D and the prospect for any real increase over a decade away, emphasis is still needed on strategic airlift. Granted a NATO scenario is less likely. But other theaters of the world still require considerable airlift over our existing capability. Even an operation such as Just Cause in Panama strained our airlift assets, and that operation was done at a location where we had some existing support and a sustainment base.

Despite the shortfall, the existing strategic lift has suffered from its association with undesirable military intervention in the third world. Some federal lawmakers have continued to neglect strategic airlift because it allows US involvement in distant places where there is a lack or perceived lack of security interests worth fighting for.[3] Airlift does not cause intervention though, it is the result of a political decision.

When the decision is made to use US forces around the world, airlift provides nearly 100 percent of the cargo and people in the first 15 days of hostilities.[4] The Civil Reserve Air Fleet (CRAF) is still an essential element of that strategic airlift. It would transport 95 percent of the passengers and 35 percent of the cargo in the early days of a deployment.[5] But, problems exist in taking full advantage of the CRAF cargo carrying capability because of a lack of ground support equipment and material handling equipment in overseas theaters. The CRAF should maintain a ready pool of air deliverable equipment for rapid deployment to overseas offload airports.[6] If our airlift assets cannot meet the challenges ahead, the sealift system will receive even more pressure.

Sealift Shortfalls

Airlift is unquestionably the right choice for rapid projection of limited forces and equipment. Sealift is slower, but clearly the most cost-effective choice for transporting large quantities of equipment and material. Past experience demonstrates just how critical sealift is to sustaining forces beyond the initial stages of a conflict. In both the Korean and Vietnam conflicts, the resupply of Israeli forces in 1973, and the Falklands War, the bulk of the material transported to support ground and air units went by sea.[7]

Past conflicts have demonstrated, and current global events make it imperative, that the US reverse the marked decline in overall sealift assets that will support its forces

in the future. This trend, which impacts our national security, will be difficult and slow to reverse due to several key factors. All three major sources of US strategic sealift face significant problems.

The first two sources of sealift are owned by the US government. The Navy's Military Sealift Command (MSC) and the US Maritime Administration. The latter maintains an inactive fleet consisting of the National Defense Reserve Fleet (NDRF) and the Ready Reserve Force (RRF).[8]

Due to the progressive deterioration of our merchant marine, the MSC was formed by the Secretary of the Navy in 1984. At that time, he designated strategic sealift as a primary mission of the US Navy, in addition to sea control and power projection. But total reliance upon the Navy for strategic sealift is not feasible and was never intended as a solution. MSC contracts for commercial services and hires merchant crews. The purpose of the Navy's program is to ensure sufficient assets are available to meet surge and prepositioned requirements.[9]

The surge requirement is met through the use of eight fast sealift ships (SL-7s), which were recently converted into 33-knot cargo carrying vessels. Three to five of these ships could deliver all of the supplies and equipment needed by a mechanized division to Southwest Asia in 11 to 12 days, or cross the Atlantic in 3 to 5 days.

The prepositioning requirement consists of 25 ships loaded and positioned around the world. Thirteen of these ships support the Marines with the maritime repositioning ships (MPS) program, and 12 support the other services with the afloat prepositioning force (APF). These are critical assets in scenarios that include short notice deployments, and they are contracted by the MSC from civilian ship companies.

The second source of strategic sealift is the NDRF, which was created at the end of World War II when the US government placed 1,400 merchant ships in mothball maritime storage. The idea was to preserve them and allow a speedy reactivation in time of national emergency.[10] But the fleet has dwindled to only 200 ships and reactivation time has been estimated between 30 and 60 days for preparation. The present fleet is old and quickly deteriorating beyond use--approximately 50 NDRF ships will be scrapped in the near future. As a result of these problems, the Ready Reserve Force (RRF) was created. These ships of the NDRF are maintained in a higher state of readiness and composed of vessels with the most military value.

The NDRF and its RRF face two critical problems. The first is the substantial expense of maintaining an idle fleet of ships in an operational state of readiness. The funds to continue this program will be difficult to obtain and necessitate painful trade-offs given the reality of decreasing budgets. The second problem is not having enough seafarers to

man the NDRF, RRF, and the US commercial fleet. One study concluded that almost one-half of the RRF vessels will be without crews in 1991 if mobilized.[11] So, more funds to increase the size of our government-owned maritime fleets, as we did in the 1980s, is not the answer.

The one viable solution to these problems is a healthier US merchant marine industry. We have pumped billions of dollars into an area that can be operated more efficiently by the private sector. But before our maritime industry can be turned around and compete successfully, some of the competitive imbalances must be corrected. These corrections will also require federal funds, but should help produce a long-term solution to our strategic sealift shortages by developing a competitive maritime industry.

Programs are essential that offer subsidies to offset the difference between US and foreign costs for operating merchant ships. Additionally, programs that offer incentives to build militarily useful vessels and to give private operators of militarily useful ships priorities in gaining defense cargo contracts are needed.[12] The new National Sealift Policy is an essential first step that will provide the guidelines for the return of a healthy maritime industry. DOD resources alone are insufficient; it is a national problem that will require coordinated action between the government and private industry.

Prepositioning

This part of the mobility triad can be an important third leg-up. Its immediate availability or close proximity to the potential conflict makes it the strong third arm of strategic mobility. These prepositioned assets equate to in-place forces which only have to be married up with their troops. Airlifting combatant personnel to their equipment is faster and avoids long convoys and troop concentrations which make lucrative enemy interdiction targets. The airlift sorties saved through prepositioned equipment during the initial days of a conflict allow additional flexibility at the most critical time.[13] Politically, prepositioning provides tangible evidence of US security commitment in whatever region they are placed.

In spite of these advantages, prepositioned materials present several problems: they are vulnerable to air, ground, and sea attack; they are very expensive because two sets of equipment are required, one prepositioned and one for training in the US; and expensive storage facilities are required. In addition, afloat prepositioned ships are expensive to maintain as are climate controlled POMCUS warehouses in Europe, and they reduce flexibility of units with prepositioned equipment to respond to crises worldwide. Gaining and maintaining necessary host-nation access to store our assets overseas is also a problem.[14]

However, given these problems, prepositioning plays a key role in our balanced approach to strategic mobility.

Without it, the trade off in air and sealift sorties to move that amount of equipment in the required time would be cost prohibitive.

Relevant Factors

In addition to the issues just addressed concerning the strategic mobility triad, other relevant factors point up the need for increased emphasis on strategic mobility. In that regard, the following section highlights challenges to the newly established US Transportation Command (USTRANSCOM) and Army equipment trends. Finally, this section addresses the effects of direct delivery, warning time, possible force reductions, and Soviet mobilization capabilities on our own strategic mobility posture.

USTRANSCOM Challenges

The mission of US Transportation Command is to provide global land, sea, and air transportation to meet national security needs. USTRANSCOM became fully operational in October 1988, but formal recommendations to combine transportation organizations first appeared in the Hoover Commission Report.[15]

After the Hoover Commission, several key events led to the establishment of USTRANSCOM. In 1978, the federal government conducted a mobility exercise, Nifty Nugget, in response to a simulated conventional attack by Warsaw Pact forces in Europe. The results included 400,000 troops killed in the first few weeks as they ran out of all types of ammunition. Supplies were still waiting at US ports or

floating on ships in the Atlantic when the exercise ended after 21 days.[16] The exercise highlighted the absence of a system to prioritize the supported commands' requirements and with no coordination of requirements, in one case, airlift planners received 27 validated requests for deploying the same unit to 27 different locations.[17]

As a result of Nifty Nugget, the JCS established the Joint Deployment Agency (JDA) to integrate plans and procedures for major deployments and to develop an automated data processing system with a common data base. The JDA was unsuccessful in creating a Joint Deployment System because of its lack of authority. The JDA's failure prompted congressional and presidential commissions to assess the problems. Their efforts led to National Security Decision Directive 219 which created a unified transportation command.[18]

USTRANSCOM is improving the joint coordination of transportation planning and execution.[19] It is accomplishing this by integrating over 100 separate major data processing systems into a Global Transportation Network (GTN).[20] The GTN is the key. If fully capable, it will be able to track mission-essential troops and material with total visibility from origin to overseas destinations and return. USTRANSCOM is still building the command, control, communications, and computer system that will provide the ability to interact with a number of transportation-related systems in the civil, federal, DOD, and allied sectors.[21]

Until USTRANSCOM can solve the CTN challenge, there is little hope it will be able to use the precious lift assets in the most efficient manner. Besides this challenge, USTRANSCOM must hope for a timely mobilization decision and ensure that deploying units continue to refine their movement requirements.[22] With scarce strategic lift resources, TRANSCOM's limitations are amplified.

Army Equipment Trends

An additional stress on strategic lift is the increase in weight of Army units. Since 1980, Army mechanized divisions are 40 percent heavier, the 101st Air Assault Division is 90 percent bigger, and the 82nd Airborne Division is 29 percent heavier.[23] The current 66 MTM/D goal for strategic airlift was established in 1981 when a congressionally mandated mobility study set the goal based on considerably lighter Army units. Even the Army's light divisions now require 5 percent more lift than they did in 1985. These weight gains also impact our sealift forces.[24]

Another problem that puts pressure on airlift resources is the Army's inattention, until recently, to airlift considerations when designing weapons and equipment.[25] For example, larger replacement jeeps require almost twice the C-141 sorties to deliver the same number overseas. The Bradley fighting vehicle requires partial disassembly prior to placing in a C-141.[26]

The problems with weight and design in US Army units have put ever increased pressure on an already over-tasked airlift capability. The Army recognized its weight problems and created the light infantry division. The light division weighs 59 percent of an airborne division and 14 percent of a mechanized division. The difficulty with light divisions is that with their limited firepower and ability to maneuver, many believe they are "too light to fight."[27]

Direct Delivery

Regardless of whether additional aircraft are procured to reduce the strategic mobility airlift shortfall, there is still military utility in acquiring the C-17. The greatest benefit comes from its direct delivery capability--the ability to quickly deliver a decisive amount of troops and equipment very near the battle area.[28]

Direct delivery offers the benefits of increased time, increased capability, efficiency, and operational flexibility when confronting an enemy.[29] These benefits give the C-17 military utility by being able to deliver outsized heavy firepower to confront an enemy as far forward as possible.[30] Other military utility provided by the C-17 includes reduced life cycle costs, greater haul capability than current airlift aircraft based on higher utilization rates, greater throughput capability at large, medium, or small airfield ramp areas, and the elimination of the need for transshipment of cargo.[31] While the C-17 will improve the airlift leg of strategic

mobility, it is just as important because of the direct delivery capability it provides when projecting combat power.

Warning Time

Recently a considerable amount of discussion has focused on warning times, particularly in Europe. Reports in the Washington Post contend that the Warsaw Pact is incapable of quickly launching a massive attack and that NATO would have 33 to 44 days of warning time prior to a major, sustained attack.[32] If this contention were true, how would it affect our strategic mobility forces?

Warning time is of value only if it is acted upon with a timely political decision to begin mobilization. History shows that the US's political leadership tries to use a number of means to avoid conflict. Every avenue from political dialogue to economic pressure is used. After other means have been pursued to reach an acceptable solution, how much of the warning time will be left? It was 10 years ago when the Soviet Union surprised the world by effectively deploying 85,000 troops with equipment to Afghanistan in one week.[33]

Force Reductions

The 23 nations from NATO and the Warsaw Pact involved in negotiations on reducing conventional forces in Europe (CFE) have agreed in principle on a ceiling of 195,000 troops for each side in Central Europe. If this agreement is finalized and the US commitment to NATO remains at 10 divisions for reinforcement, then the number of troops and equipment the US

will provide through strategic mobility will increase.[34] Some contend that an increase in warning time will give sealift the time to move the men and material needed. As discussed earlier though, warning time is of little value if decisions are not made in a timely manner.

A CFE agreement may balance troops in the Atlantic-to-the-Urals zone, but it is much easier to move Soviet divisions across the Urals than to reinforce NATO across the Atlantic. For this reason, NATO must ensure that the Warsaw Pact is limited in the number of large stockpile areas it can maintain in Europe and that verification measures are instituted to increase unambiguous warning time for NATO.[35]

Force reductions also create problems with sustainability. Currently, NATO is significantly below the 45-day requirement for modern munitions and air-to-air missiles. Creating a larger deployment requirement for the strategic mobility forces means that it will be longer before those forces can satisfy the sustainability needs of NATO. "Thus, sustainability or strategic lift deficiencies could contribute to the outbreak of war by reducing the deterrent effect of NATO's conventional posture."[36]

Soviet Mobilization Capabilities

As reduced numbers of conventional forces in Europe become a reality we must continually evaluate our strategic mobility capabilities against the changing threat. A key

ingredient to the changing threat is the Soviet capabilities in strategic deployment of their forces.

Over the past decade, Soviet writings on strategic deployment contain new principles that stress planning based on speed, secrecy, and deception. This mobilization system is designed to be one of quick reaction and draws on the Soviet Union's large reserve military manpower base plus earmarked transport vehicles and equipment from the national economy.[37] Increased emphasis on training these reserve personnel (many of whom may be today's regular troops) and covert mobility exercises may have a significant impact on the time it takes the Soviets to put an effective fighting force on the front line. Reserve manpower pools and transportation equipment with dual use in their national economy will be difficult to negotiate and even tougher to verify.

Soviet capabilities in strategic movement are well diversified and depend on all forms of transport--rail, inland waterways, units marching under their own power as well as air and land military transport. Areas receiving emphasis since the 1970s include improving the road, rail, and water transportation links, and hardening communication facilities for controlling theater forces. These means of fast and flexible strategic deployment can deliver rested combat units to forward areas quickly.[38] These capabilities may suggest that substantial conventional force reductions may well be acceptable to Soviet planners and negotiators.[39]

Conclusion

Emphasis on strategic mobility is not only still needed, but that emphasis has become more important with the rapidly changing world situation. As the threat changes, many of the factors previously used for planning and determining our state of readiness become less reliable. As potential adversaries change size, location, and capabilities, so must our ability to deploy, employ, and sustain forces. Many of these uncertainties and instabilities require an even stronger strategic mobility triad than in a more stable yet higher threat environment.

Military and civilian decisionmakers must remain acutely aware that flexibility, redundancy, and survivability are the products of a balanced mobility triad. These factors are of even greater value when expected loss rates are applied against our mobility forces. Maintaining strength in each arm of the triad may be what makes the difference against the uncertainty and fog of the next war. "Wars are won by having the right stuff, at the right place, at the right time."

As the problems facing our strategic mobility capabilities are addressed, new and reoccurring variables must be included in the equation. Force reductions, changing warning times, new third world threats, tentative host-nation prepositioning agreements, and a variety of other issues must be considered.

In addition, some old strategic mobility problems persist. These concerns and shortfalls were addressed in this study with expert opinions reviewed and some solutions proposed. Airlift, sealift, and prepositioning forces are large, complex, and very expensive. Therefore, proposed courses of action to keep this triad balanced and effective are also expensive. Meeting these expenses will be an increasingly difficult task as the budget continues to shrink and the inevitable painful trade-offs become necessary.

In spite of these challenges, history demands a credible strategic mobility capability in a constant state of readiness. From warning time to first deployment: Just Cause--40 hours; Urgent Fury--96 hours; and Yom Kippur, after assistance was requested--48 hours. Regardless of its state of readiness, a force that can't be projected and sustained where it's needed is a hollow force.

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