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**Operational Logistics  
and the Gulf War**

By William G. Pagonis and Michael D. Krause

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# OPERATIONAL LOGISTICS AND THE GULF WAR

by

**William G. Pagonis**

and

**Michael D. Krause**

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**William G. Pagonis**

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**Michael D. Krause**

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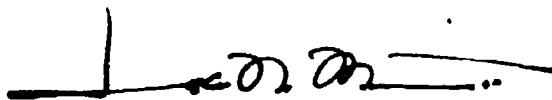


## FOREWORD

The Gulf War was underwritten by logistics. Building the Southwest Asia theater infrastructure, deploying U.S. forces, sustaining the campaign and bringing the forces and their materiel back home were major accomplishments. Key to Operations Desert Shield and Desert Storm was the close coordination between the logistical and operational commands and the commanders' understanding that logistics must dovetail with the mission and concept of operations of the projected force.

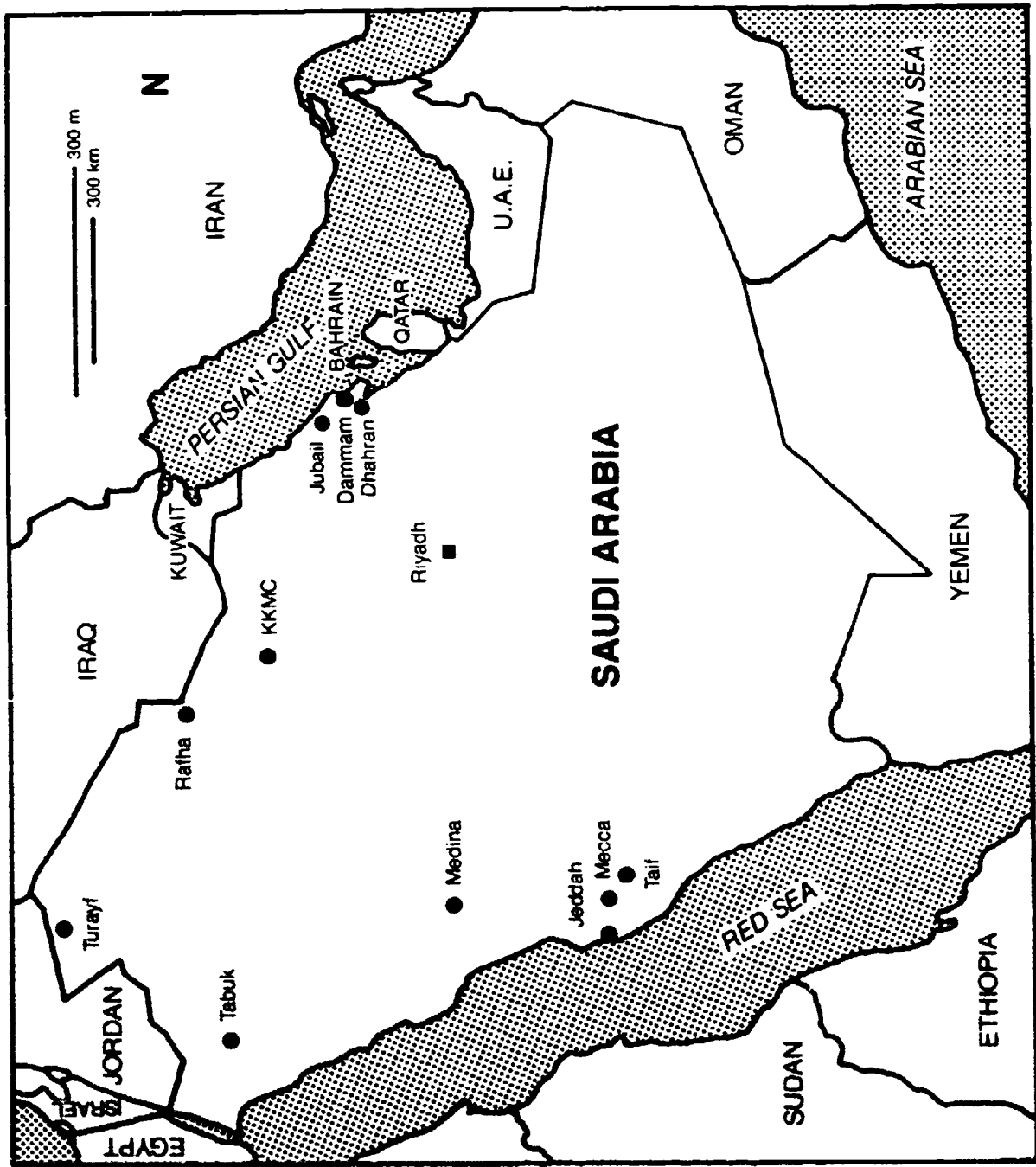
Addressing the fundamentals of the operational art, LTG William G. ("Gus") Pagonis, the theater logistical commander in the Gulf War, and his logistics plans chief, Colonel Michael Krause, show how and why logistics must be part and parcel of the operational concept. The theater mission, concept of operations and scheme of maneuver are examined to bring out the criticality of logistics in effecting surprise and deception. Concluding with a series of observations on the logistical operations of the war, the authors make it clear that operational logistics will be critical in future power projections of U.S. forces.

In the final analysis, this paper serves notice that the study of the operational art must encompass an appreciation for operational logistics on a par with that usually accorded the operations of combat formations.



Jack N. Merritt  
General, USA Retired  
President

October 1992



# OPERATIONAL LOGISTICS AND THE GULF WAR

## Introduction

In January 1991, one of the most successful wars in America's history commenced. Logisticians overcame in an extraordinary way what General H. Norman Schwarzkopf, the theater commander, called a "daunting task." Logistics did three things: built the theater infrastructure, sustained a victorious military campaign, and closed out the theater of war by bringing personnel and materiel home. The discussion that follows is based on the assumption that the reader is familiar with the Desert Storm campaign. Therefore, details of tactical operations are omitted.

At the start of the war, General Colin Powell, chairman of the Joint Chiefs of Staff, spoke in simple terms: "We are going to cut it off and kill it." Put into a military context, he revealed the operational concept for the upcoming campaign.

This paper provides a framework for discussing the role of operational logistics in the ground phase of the Gulf War. It addresses the essential logistical differences between forward-deployed forces and power-projection forces; the elements of operational art as the connector between strategy and tactics; and logistics in an operational setting in Southwest Asia. The conclusions suggest considerations of operational logistics which will be important in future deployments. Indirectly, closer integration of logistics into campaign planning, particularly the concepts of operations, maneuver and reserves, is suggested.

## The Framework of Operational Art

During the last decade or so, the United States Army has rediscovered operational art. In this period, major doctrinal changes have been introduced, debated and reformulated. There has been a renaissance of thinking about the operational level of war and operational art.

Operational art is different from strategy and tactics. It holds to a different logic. The perspective of operational art is different as well. Operational art is the connection between the aims of strategy and tactics. Strategy involves the conduct of warfare to accomplish political and military aims. While tactics involves the conduct of battle to overcome and destroy the enemy, operational art contributes to the conduct of strategy by the achievement of military objectives. It differs from strategy by not having a political objective.

In the 19th century, German Field Marshal Helmuth von Moltke began to differentiate among military strategy, operations and tactics. He recognized that strategy



in war is inherently linked with the attainment of the political objective, and that operational art defines military objectives which underpin the political objectives. His conduct of operations — his practice of the operational art — has been studied ever since. German usage and practice led to Russian-Soviet adoption of the operational art concept in the 20th century. Rediscovery of the importance of the operational art for American and allied forces is a consequence of the Cold War.

The dimensions of war change among strategy, operations and tactics. The strategist aims at the enemy's center of gravity, be it a nation's will, the delicate seam of an alliance or key resources. The operational center of gravity is the mass of enemy military force and its command, control and communications.

At the tactical level, the tactician has a more limited perspective. Tactical commanders are concerned with how to fight; operational commanders define where and when to fight; and strategic commanders decide whether or not to fight.

In tactics, maneuver and fires are mutually interdependent. At the operational level, maneuver and fires are used to unbalance the enemy and achieve momentum and tempo.

In tactics, intelligence is concerned with capabilities. At the operational level, intelligence is concerned more with intentions. Deception is used by the tactical commander to hide forces. In the operational context, deception is used to hide intent and cause the enemy to reveal his intent.

In operational art, the use of reserves is critical, but they are not the same reserves — an uncommitted ready force — thought of at the tactical level. Reserves at the operational level should be thought of as the future use of forces which may or may not be presently engaged. Also, at the operational level, logistics may be considered another form of reserve. At the strategic level, force generation capability and logistics are the reserves.

At the tactical level, logistics is used to affect the battle in progress. However, logistics at the operational level is more than sustaining the force. Logistics is part of the commander's concept of operations and scheme of maneuver. Logistics adds synergism to all of the elements of operational art and helps to underwrite campaigns.

At the strategic level, the commander looks toward the outcome of campaigns of the war as a means of achieving policy objectives. His time horizon is distant. At the operational level, the commander also looks to the future; he looks beyond the outcome of battle. He is concerned with several moves ahead, in days, weeks and even months. The tactical commander looks toward the outcome of engagements and battles in hours.

The strategist formulates aims and generates capabilities; the operational commander seeks unity of effort over time; the tactical commander orders immediate action in the field of battle. Operational art involves a vision of unity of action which carries out the strategic objectives.

As the previous discussion points out, operational art is composed of different perspectives. The elements of operational art — which are essential to its understanding — are outlined below. This framework is used in turn to measure operational logistics in the Gulf War.

**Theater Setting:** The strategic view of a theater of war holds to the political and military objectives to be realized. The strategist sees the theater as a whole. He views the nature of its geography and the general nature of military forces in the theater. The operational commander holds to a different view; he has to realize certain military objectives. These objectives concern the capabilities of the opposing military force, particularly the center of gravity of the opposing force, or its mass. The operational commander also looks to the geography of the theater in determining broad plans of action which will facilitate his concept of operations.

**Objectives:** Policy dominates the conduct of warfare. Prussian general and military strategist Carl von Clausewitz reminds us: "Warfare is the continuation of politics by other means." A nation-state's reason for going to war has a political and military objective. The definition of national and political objectives and the determination of the means to achieve them is strategy. The translation of military and political objectives into military objectives in a theater of war is operational art.

**Concept of Operations:** What makes for a successful campaign? How does a commander integrate and synchronize the diverse forces under his command and direct them to carry out the mission? A commander thinks through the plan which will accomplish the operational objective and in turn will realize the strategic goal. The concept must convey his intent and insure unity of effort. The commander's concept of operation is the composer's score used to orchestrate the entire conduct of play. Above all, the concept must be based on clear objectives. The commander measures his vision within the stretched capacity of logistical operations.

**Intelligence:** the ability to see. This is not only what meets the eye but also the ability to visualize the opponent's intent and capability. The commander who, in this contest of wills, thinks through what his opponent's interests and actions are, the commander who does a hypothesis of enemy intentions, will be better prepared to accomplish his own course of action. A commander may focus on answering these questions: Where are the enemy's reserves? When can they move? Does the enemy force commander have a reserve? If not, is there an indication of main effort which can realize the creation of forces in future time?

**Deception:** the ability to fool and not to be fooled. Deception is best when it causes the opponent to convince himself of the certainty of his own actions; it is best when it causes him to make choices. Deception is not merely "cover and concealment." Deception aims at causing surprise and creating ambiguity.

**Maneuver:** This is more than just movement. It is a concept of the integrated use of various forces and functions to unhinge the enemy. Maneuver creates leverage which generates opportunity. Concepts of operation translated into schemes of maneuver present the opponent with difficult and unwanted choices which are key in the creation of leverage. Maneuver uses all aspects of the application of force and involves the combination of fires, movement and reserves.

**Operational Fires:** This element involves the integrated application of land, sea and air firepower to attain an objective. But operational fires are not just the massed application of artillery and air or naval supporting fires; rather, it is the application of fires on critical components of the enemy which cause him to quit. This is not just "fire and movement" writ large; rather, it is an understanding of the combination of speed of movement with delivery of fires. The concentration of fires can create leverage.

**Reserves:** The strategist generates them, the operational commander creates them through future capabilities, and the tactical commander has them at the ready. In each case, reserves are critical to the outcome of the war, the campaign and the battle. Forces in reserve placed at the right time and place, created from extant or generated forces, can decide the outcome of a campaign.

**Operational Logistics:** Logistics provides the ability to mass combat power. It is a way of structuring a battle, campaign or strategic setting. It is calculated to create possibilities for future force utilization. Logistics determines how, when and where the force arrives in a theater; where and when combat power can be massed. Logistics underwrites the concept of operations and the scheme of maneuver and is the fulcrum upon which leverage can be created.

**Command:** This element involves the methodology for the integrated, orchestrated and synchronized application of force. The commander is a composer and conductor; he is a chess player — playing multiple games on different boards. The commander must have vision, purpose, balance and concentration. The communication of the commander's intention through simple, crisp, common-sense direction may be the key to a successful campaign. Command and operational art bring the logic and perspective of theater warfare and the conduct of campaigns together.

This framework of operational art can be used to measure operational logistics in the Gulf War. The nature of forces to be employed must also be weighed in understanding the role of operational logistics.

## **Logistics of Forward-Deployed and Power-Projection Forces**

Inherent in the difference between power-projection and forward-deployed forces is the maturity of the theater. In a theater where forces are forward deployed, the infrastructure of the theater is known and their use is well planned. The logistical readiness of forward-deployed forces enables those forces to roll out of their different bases and deploy into combat. Sustainment supplies, reserve stocks and spare sets of equipment are prepositioned with the forward-deployed force. A forward-deployed force is familiar with road, rail, aerodromes, ports and infrastructure that have been used numerous times in peacetime rehearsals. Contracts for services and supplies are established and exercised. Communications — telephone and radio — are well established, with satellite relay where necessary. All aspects of the logistical movement of forces and their sustainment and control would be known, rehearsed and in readiness. Little would be unknown in the logistical world, including that of the enemy.

This is not necessarily true in the power projection of forces. The theater of war and theater of operations may have only very recently entered the planning horizon. The theater may not have any U.S. forces near it or on the ground. The logistical infrastructure — the ports, rail, road, airports, telecommunication system — may be known only by study conducted from afar. The plethora of things that go with living in a place where you expect to fight will simply not be there. Everything, including fuel, food, ammunition, transportation, communications equipment and maps, has to be brought with the force being projected into the theater. A thousand questions will be left unanswered. Will there be off-loading ramps at the aerodromes? What types of cranes are available in the ports? How much water can be provided? Are there military-specification or compatible fuel and oil? What personal hygiene facilities are there? Can an influx of troops — at surge rates of 5,000 a day — be accommodated? Where will soldiers live, sleep, eat, work, shower and go to the bathroom? Can a force coming from a distinctly different climate function? How long will it take for soldiers' equipment to arrive? What of cultural, religious and societal differences? How will soldiers be received into an entirely different culture? These questions — in the broadest sense — indicate the potential unknown nature of the theater logistical infrastructure and critical shortfalls which may confront a power-projection force.

In power projection, the operational commander — the theater commander-in-chief — is constrained by the strategic aspects of logistics. How much air- and sealift is available and how much time is available? The national-level decisionmakers will be advised of how much lift to make available by doing a risk analysis. If speed is of the essence, emergency authority from the president may be required for allocation of civilian aircraft and ships. The next decision point involves the risks to be taken in projecting into the theater combat forces versus logistical or combat service support forces. Strategic considerations may dictate initial deployment of predominantly combat forces.

## Theater Setting and Objectives

Application of force in a theater is underwritten by logistics. The nature of the theater will determine the nature of the logistical support. Logistics at the strategic level involves determining how the force gets to the theater, what materiel it will bring, and how fast it gets into the theater; this is essentially a strategic movement problem. At the operational level, logistics must be in consonance with the logic of the operational concept. The logistics applications in Southwest Asia can be measured through use of the operational framework described above.

The strategic objectives of the Gulf War articulated by President Bush were to: free the western hostages held by Iraq; defend Saudi Arabia; liberate Kuwait; and destroy weapons of mass destruction so as to increase the stability of the region.

General Schwarzkopf, the theater commander, used these strategic objectives to focus on the military objective to destroy the Iraqi military force. General Schwarzkopf postulated the center of gravity of Iraqi forces to be two-fold: the Republican Guard — core, well-equipped forces which supported the regime of Saddam Hussein — and the command and control infrastructure used by Saddam Hussein to control his military forces. Hence, the objective of the Central Command's theater campaign was to destroy the Iraqi force after crippling Saddam Hussein's centralized command, control and communications.

The first objective for General Schwarzkopf was to deter the Iraqi force from invading Saudi Arabia. This was, after all, in consonance with the strategic military mission to defend the oil-rich nation. Saddam Hussein's forces in Kuwait, after occupation of this small sheikdom, could have continued their offensive down the Saudi Arabian coastal highway aiming for the port of Dammam. The port of Jubail and oil-producing areas would have fallen into Iraqi hands.

What deterred Iraq from continuing the invasion? At this stage we do not know except to point out that the application of power-projection forces — the quick response of naval, air and ground forces — evidently made Saddam Hussein think twice about continuing his offensive. It may be that he never intended to invade Saudi Arabia. It may be that he calculated the effects of exposure of the long logistical tail of his forces to allied interdiction. Certainly the use of allied naval and ground-based attack aircraft would have had significant effect on the ability of Iraqi ground forces. But this is speculation.

What is known is this: The fast application of strategic mobility — the staging of air, naval and ground forces into the theater — accomplished the defense mission.

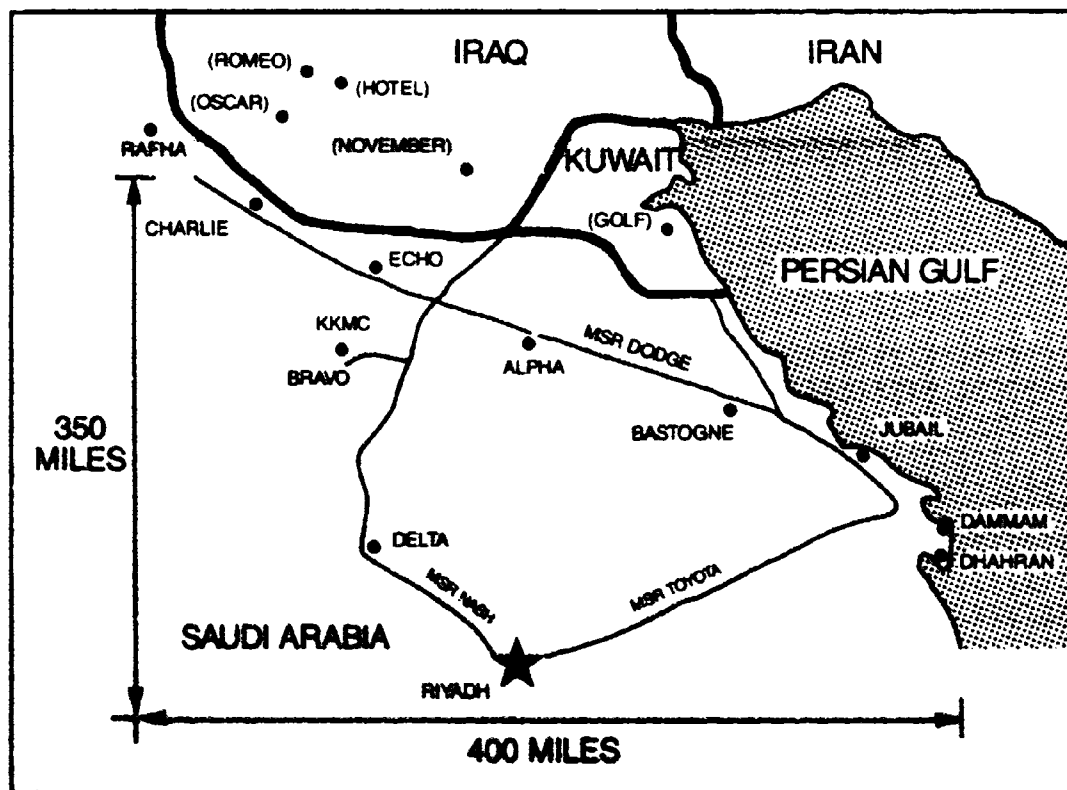
Distances were immense — 8,000 miles by air and more than 10,000 miles by sea. The strategic lift was further engaged by activation of the civilian air reserve fleet and the military sealift reserve fleet. Over 10,000 air sorties and more than 500 ships brought the force to the theater. Time was a critical factor. Prepositioned ships, which contained

critical initial buildup items — ammunition, water purification equipment, port handling equipment and other logistical materiel — facilitated this process.

The incoming force used the existing airports of Dhahran, Riyadh and, to a lesser extent, King Khalid Military City (KKMC). At these airports, the problem became how to receive, stage and move forward the soldiers and airmen coming into the theater. A national command authority decision to first send in combat forces made the logistical effort more difficult. In light of this decision, early-arriving theater logisticians recognized the need to use host nation support to the utmost.

The host nation, Saudi Arabia, offered to meet the force's basic needs — food, water, fuel and shelter. But providing for the simple needs of 540,000 personnel was an immense undertaking. Organization of what would be provided by the Saudi government became a first priority. In-theater transportation already existed due to the large number of civilian trucks used in Saudi Arabia for construction and transport. Trucks of all description, but particularly heavy equipment transporters, were contracted for the buildup of the theater infrastructure and later for the sustainment of the ground campaign.

Logistics at the operational level was defined by the nature of the theater and the military objectives. These were conditioned by the factors of time and space and the need first to deter and then to fight. These conditions underwrote the buildup of the theater infrastructure and reliance upon host nation support.



**Desert Shield: Major Supply Routes and Logistical Bases**

## **Concept of Operations and Scheme of Maneuver**

General Schwarzkopf explained his concept of operations in a news briefing shortly after the victorious ground campaign. His concept was predicated on building up the force, first to deter the enemy from attacking (thereby gaining time) and then to defend. Each day won time and gave credibility to deterrence. Time and deterrence also gained logistical advantage. As the buildup continued, the logistical advantage figured prominently in the evolving concept of operations for the campaign. Next would come an offensive option.

Schwarzkopf's concept of operations: First, blind the enemy; if the enemy could not see, he could not position his force to counter the allied blow. Next, have the enemy think the allied forces were coming where he expected them to come: an assault from the Persian Gulf into Kuwait, along with a land assault against the main Iraqi positions in occupied Kuwait, and a flanking attack via the Wadi al Batin to try to get around these positions. Let him fool himself into thinking what he was disposed to think in the first place. Use the air campaign to blind and cripple his command, control, communications and intelligence mediums, threaten an amphibious assault, attack the main Iraqi positions to hold them in place, and then use the agility and punching power of two corps to outflank Iraqi forces. This would cut off and destroy the much vaunted Iraqi Republican Guard forces, the operational reserves of the Iraqi army.

This commander's concept was predicated on two logistical concepts: first, to build logistical bases which could support two corps from forward locations (the distances from the coastal ports and airbases — more than 350 miles — made these bases a prerequisite for ground operations); and second, to move two corps which were malpositioned. (The XVIII Airborne Corps to the east and the VII Corps to the west had to change positions.) These two logistical tasks, daunting in themselves, had to be done without leaving tracks in the desert.

General Schwarzkopf's concept depended upon having the enemy fool himself. The logistical buildup of forward logistical bases, far to the west of the Wadi al Batin, even to the west of King Khalid Military City and to the west of any combat forces, could be seen. The solution was not to start the buildup until the air campaign had blinded the Iraqis. Hence, the westward movement of supplies for the two corps could not start until the blinding had worked. Then, while the buildup was ongoing during the aerial assault, the movement of the two corps to their forward tactical positions could take place under the air umbrella. General Schwarzkopf's concept was predicated on logistics not revealing his intent. While logistical forward bases were crucial to support the corps and the movement of the two corps was a necessity, the establishment of these bases and movement incident thereto could be detected and would signal intent.

In fact, the building of the forward logistical bases and the westward movement of the two corps — crossing them in the process — was so incredible an undertaking that allied commanders initially did not believe it could be done.

On December 27, 1990, the Secretary of Defense and the chairman of the Joint Chiefs of Staff were briefed on the concept of operations by General Schwarzkopf in Riyadh. After General Schwarzkopf explained his "end-run concept," the commanders from the two Army corps, the Marines, the Air Force and the 22d Support Command (SUPCOM) presented their respective plans, in broad conceptual terms, to support the flanking movement. The logistical plans paid particular attention to the crossing of the two corps and the building of forward logistical bases to the west.

Toward the end of the briefing, General Schwarzkopf indicated that nothing was to move until after the January 15 expiration of the United Nations deadline for redeployment of Iraqi forces from Kuwait. When a head start on the movement to get log bases in place was requested, General Schwarzkopf spoke bluntly: "That's not possible. The entire plan hinges on surprise and deception. If you start relocating your log bases tomorrow, we'd run a great risk of being detected. Hussein would shift his defenses westward. Or worse, he'd order his forces to attack before the deadline and preempt our strategy."

He concluded, "What we need to know is exactly how long it will take to get those log bases out there, in position to support the flanking maneuver, assuming you started moving out on 16 January. ... We'll meet again on Saturday [December 29] to discuss a revised plan to accommodate these new goals."

The logisticians went back to the drawing board. After frantic efforts a revised plan was taken to Riyadh and, on December 29, the requested briefing took place. The briefing followed the format of the earlier briefing, with General Schwarzkopf's introduction including the comment that the president had been briefed on the end-run plan. The commander's staff representatives presented their plans. Most of these included more logistical support than could be provided. The revised 21-day logistics plan needed to build the log bases and move the corps was then presented.

This briefing of the logistics plan was a turning point. The other commanders rallied to the 22d SUPCOM's support, sensing that, if all worked together, the logistical effort would succeed. Almost as a sidebar, General Schwarzkopf reflected that if his commanders were skeptical about the plausibility of the logistical effort in supporting the concept of operations, the enemy would be skeptical as well. In short, the magnitude of effort required to support the westward flank attack — "the end run" — served the deception needs.

The sequence was detailed planning and then movement. For 18 critical days, 18-wheelers were transporting combat equipment and materiel, passing one point on the westward road every minute, every hour, 24 hours a day. The movement was staggering. By February 24, each of the corps was in position and the logistical forward bases stocked to the necessary levels.

The central concept of maneuver was to sweep the western flank. As we have seen, this was intimately tied to achieving operational surprise. Hence the enemy had to fool himself into thinking that a western flanking sweep was all but impossible.



The malpositioned corps — XVIII Airborne in the east and VII Corps in the west— had to be repositioned. Further, elements of the VII Corps would continue to arrive from Europe until the beginning of the campaign. As if the movement and log base building were not enough for the logisticians to accomplish in support of the scheme of maneuver, the force had to be modernized. The incoming forces had to exchange their Abrams M1 tanks, which had 105mm guns, for M1A1s with 120mm guns and better chemical and armor protection. On top of this, the incoming VII Corps equipment was European forest green. This would not do in the desert; therefore, equipment was painted desert camouflage tan. In short, there was much to do before the scheme of maneuver could be carried out. Modernization, painting, transport and log base construction had to be accomplished.

Mobility was the key. This meant high combat systems readiness. Complete factory-to-foxhole integrated maintenance and distribution was practiced. The Army Materiel Command and other commands and agencies were directly involved in helping to achieve the highest readiness to date.

### **Intelligence and Deception**

Logistics reveals capability as well as intent.

During the American Civil War, the published news accounts of Union nonbattle casualties per thousand allowed General Lee to know the exact size of General Hooker's Army of the Potomac before the Chancellorsville campaign. The movement of supplies — particularly bargeloads of food — on the main supply route from Washington down to Aquia Harbor by Fredericksburg revealed the buildup of Hooker's planned offensive.

Similarly, at the national intelligence level, the Iraqi logistical buildup revealed their intent to invade Kuwait. All the signposts were there. National-level intelligence analysis indicated as much but was not given credence until the event.

With respect to Desert Shield preparations, news reports from the theater and Pentagon-level briefings did not hint at the magnitude of the logistical effort required to pull off the westward movement. The buildup in the ports and airports could be seen by the enemy. The movement of forces into the eastern provinces of Saudi Arabia could be followed. The positioning of even one brigade to King Khalid Military City occasioned a repositioning of Iraqi forces to the west and further deployment of forces to western Kuwait and southern Iraq to prevent a flanking maneuver around the Wadi al Batin.

How do you preclude the Iraqis from obtaining intelligence regarding millions of tons of supplies and materiel? How do you hide logistics? At operational level, it is important not to reveal intent to the enemy. Logistics can reveal intended action by telegraphing the buildup of forces, particularly if surprise is essential, and surprise was the key to Schwarzkopf's western flanking offensive. Log bases — if built too soon — would reveal his concept of operations. Therefore, logistics had to be an integral part of the deception operation.

On the question of "hiding" logistics, the best approach was to stay in the Saudi eastern province, to use existing facilities in the east and KKMC only sparingly, to disperse and wait, and only after the beginning of the air campaign to move logistics westward.

During the buildup of the force, logistic base Bastogne was built for the XVIII Airborne Corps. When the VII Corps was added, log base Alpha was constructed. But General Schwarzkopf's decision to surprise the enemy with the western sweep meant no other log bases would be constructed. This meant construction of log bases Bravo, Echo and Charlie would have to await the start of the air campaign. The need for surprise — the need to fool the opponent — had a definitive logistical component. Again, General Schwarzkopf reasoned that if his commanders thought the logistical task daunting, then the enemy would think so as well. Therefore, logistical tracks in the sand could not be allowed until the opponent was blinded.

The extent of this deception was not known back in the United States. Even highly classified briefings in the Army's Pentagon war room — the operations center — kept the force position and their logistical bases in the eastern province until after the beginning of the ground campaign.

The other question related to intelligence and deception was the logistical supportability of the western flanking move. Could it be done? Could two malpositioned corps be crossed and repositioned at the same time the logistical bases were being constructed? These questions were answered in the 22d Support Command logistical plan, which worked out detailed movement schedules for the transportation of the two corps and the shipment of supplies and materiel for the logistical bases. It took longer than originally planned; two weeks became three. One reason, therefore, for the stretching of the air campaign from two to three weeks was the time needed to position the corps and build up the logistical bases.

### **Operational Fires**

The planned initial massive use of artillery and multiple launch rocket systems required significant tonnage of ammunition well forward. The first problem was to get more than 400,000 tons of ammunition into the theater. The second was to get it forward to enable the tactical maneuver units to have battalion-level artillery direct fire support.

Tactical fires to support ground maneuver units is generally understood, but operational fires are far more complex. These fires are used to support the scheme of maneuver. In the desert, operational fires were carried out jointly. Naval Tomahawk cruise missiles and airstrikes, Air Force A-10 and other tactical aircraft, and Army rotary aircraft — Apaches — were massed and apportioned to fit the maneuver campaign. From the start, to meet operational needs and blind the enemy, operational fires were applied. Operational logistics had to supply the necessary ammunition. This meant moving large quantities of ammunition quickly to the right place at the right time.

Ammunition at forward log bases became mobile, which caused a problem at the tactical units. Combat formations retained a great number of the uploaded trailers, preventing them from being reused for a return trip, thus causing a shortage in trailers. This was also true of fuel tankers, where the same problem of withholding fuel trailers applied. Transportation capability was limited, though thousands of contractor vehicles were hired. This meant that some tactical units operated at the edge of the logistical envelope.

Additional forward logistical bases were planned in Iraq. However, because of the fast-paced nature of the ground campaign, these planned forward log bases were never formally set up. Instead they became trailer transfer points for key elements of supply, particularly ammunition and fuel.

Mobility was central to the resupply of ammunition. In turn, operational fires were key to breaching the Iraqi lines, blinding them and destroying their will to resist. Who will forget the application of massive operational fires on a highway north of Kuwait City?

## **Reserves**

Reserves at the operational level involve the planned use of force in a future time frame. This means the commander must visualize using presently engaged forces for future missions — all at the decisive place and at the right time. The same is true in the ability of operational logistics to create reserves. Operational logistics gave General Schwarzkopf's concept of operations the capability to use the First Cavalry Division in a demonstration role up the Wadi al Batin, then rearm, refuel, reenergize and contribute to the combat power of the VII Corps.

Operational logistics provided for planned reconstitution of units. Standby tank crews, standby vehicle drivers and provisional units for forward area support constituted planned reinforcements as needed by the operational commander.

Logistics at its best allows the operational commander to mass his combat power for decisive action. When needed, logistics creates reserves through the use of materiel and personnel to create or reconstitute units where needed.

In the redeployment from the theater, reserves continued to play key roles. The operational commander's responsibility for the campaign did not end with the cease-fire. He continued to have mission responsibility for the theater and specified that all ground components would leave within the shortest possible time. Use of logistical reserves, particularly units of the Army's reserve components, made this effort possible.

## **Command**

Command at the operational level focuses principally on insuring unity of effort. The operational commander apportions this effort through correlation among theater-peculiar needs, weaving them into his concept of operations to support attainment of the objective.

One critical innovation by General Schwarzkopf was to give one-stop logistical command responsibility. He vested operational logistics command in the 22d Support Command. The theater logistician spoke for the logistical needs of the theater and focused on supporting the unique campaign plan.

Within the theater support command, command was centralized for plans and operations but decentralized in execution. This permitted concentration of effort. Total communication in the entire command through innovative and imaginative management was accomplished by the use of both old and new techniques. (The ability to communicate at every level with the commanding general using 3x5 cards was unique. This simple and effective medium allowed a private's ideas to come to the commander immediately.) Situation briefings and thorough reviews took place daily. Replication of this command medium in the forward area at KKMC during the war itself was another innovation. A third aspect of communication was the continual daily logistical situation report faxed and transmitted up the chain of command and going directly to the theater commander and Department of the Army operations center. Telephone consultations between the theater and logistical commanders and the supporting Army staff back home took place daily.

## **Operational Logistics: Some Observations**

Statistics are part of the story of operational logistics. More than 117,000 wheeled vehicles and 12,000 tanks and armored vehicles were deployed and redeployed. Half of these vehicles and other items of equipment had to be repainted in desert camouflage. More than 1,700 helicopters, 41,000 cargo containers and 350,000 tons of unexpended ammunition were hauled to the theater and returned in over 500 ships and 10,000 aircraft sorties. Over 95 million meals were served and 2.5 billion gallons of fuel consumed. Mail for the 540,000 soldiers, airmen, marines and sailors reached staggering proportions — 38,000 tons, enough to cover 21 football fields eight feet high. More than 5,000 department and contractor civilians were deployed.

Some observations on operational logistics are in order: Strategic lift worked, but more airlift and fast sealift ships are needed. Lift and mobility are key. The ability to obtain the support of vehicles of all descriptions, but particularly heavy equipment transporters, was critical. The fuel, water, food, shelter and communications provided by the Saudi government were critical. If this support had to be brought to the theater, the problems would have been much more difficult.

Operational planning at a centralized level facilitated execution at the right time and place. Contractor support, deployment of military department civilians and host nation support were significant aspects of operational logistics. The use of a theater army area command structure (the 22d Support Command) and a theater single integrated logistics focus were consistent with the operational art.

There was not enough materiel handling equipment to do the job. A source of heavy equipment transporters should be part of planning for future operational logistics use. Truckstops/convoy support centers for resting, refueling, feeding and maintaining the vehicle force and the forward support coordinator concepts should be part of logistical doctrine. Infrastructure planning for resource management, contract support and host nation capabilities should be part of theater fast forward-deployment capability. Further, a cell of logisticians should be available at a moment's notice for any future contingency deployment. Allied logistics efforts must be fully integrated into operational logistics.

The theater commander's concept of operation and scheme of maneuver were communicated to the theater logistical command. Within the logistical command, planning accounted for how each support element would fit into the concept and the scheme of maneuver. Rapid and innovative communications flow insured that problems became solutions. Problems which needed high-level help — from the Washington command post, the Army Materiel Command or the Defense Logistics Agency — were made known quickly and acted upon.

Operational logistics in the Gulf War showed the value of the total force. Individual reservists and units were mobilized from the Army National Guard and the Army Reserve and filled critical roles in the reception, forward movement and sustainment of the force. During the logistical support of the ground war, the integrated logistical force supported the campaign. In the redeployment of the force, again the nation's reserves played a crucial role.

"Forget logistics and you lose" is an apt expression attributed to the VII Corps commander, LTG Frederick Franks. Most importantly, logistics at the operational level is an integral part of the concept of operations. Operational logistics is the foundation for successful operational planning and execution.

General Schwarzkopf recognized the role of logistics when he said, "The logisticians faced a dauntless task and pulled off a spectacular success."

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