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INTRATHEATER GROUND TRANSPORTATION OPERATIONS DURING DESERT SHIELD AND DESERT STORM: A PERSONAL EXPERIENCE MONOGRAPH

by

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Preface

This report stems from my personal observations and experiences as Transportation Plans Officer in the 22nd Support Command (SUPCOM) logistics-planning cell during Operation Desert Shield and Desert Storm. The 22nd SUPCOM, commanded by Lieutenant General William "Gus" Pagonis was the senior logistics command in Saudi Arabia and had responsibility for developing and implementing the theater logistics plan to support the war. One of General Pagonis' many innovations was the formation of a small logistics planning cell to do the bulk of the logistics planning and coordination to support theater combat operations.

Having arrived in Saudi Arabia on 13 October 1990 and remaining there until 21 September 1991, I had an opportunity to observe the entire logistics operation, from deployment to initial reception in theater, onward movement, build-up for offensive operations, support of the ground offensive, and redeployment. In my capacity as transportation planner, I was directly involved in developing the theater logistics concept of support. My primary focus was developing and coordinating the theater transportation support plan. This included the theater movement plan for the simultaneous battlefield relocation of the XVIII Airborne Corps and the VII Corps, while concurrently moving supplies to the forward logistics bases to support offensive operations.

During later stages of the operation I also worked as one of General Pagonis' "Ghostbusters" (logistics monitors) in the logistics bases and on the main supply routes.

Eventually, I also worked as Operations Officer at both the Ports of Jubayl and Dammam. These varied experiences provided me an invaluable opportunity to closely observe the theater logistics operations and the impact of ground transportation upon the success of the logistics system and tactical operations. These first hand observations have helped me gain a deeper understanding and appreciation not only of the importance of ground transportation to tactical success on the battlefield, but also of the problems associated with planning and executing ground transportation in support of combat operations. I hope that the observations provided in this report will help logisticians and transporters who might face similar challenges in future conflicts.

I thank my academic advisor, Professor Theodore M. Kluz, who was instrumental in guiding and prodding me through this study. He provided me valuable insights, assistance, and recommendations to help keep me focused and moving in the right direction.

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Abstract

Operations Desert Shield and Desert Storm presented a tremendous challenge to ground transportation capabilities. Millions of gallons of fuel, hundreds of thousands of troops, thousands of tons of ammunition and other supplies, thousands of tanks, combat vehicles, and artillery pieces had to be moved hundreds of miles from the Seaports of Debarkation (SPOD) to Forward Logistics Bases within the theater of operation to support execution of the war.

Without question, U.S. and Coalition forces achieved an overwhelming victory during Operation Desert Storm and ground transportation played a vital role throughout the operation. In the pages that follow, Lieutenant Colonel Paul L. Willis recounts his experience planning and coordinating ground transportation operations during Operations Desert Shield and Desert Storm. At the time of these operations, LTC Willis was the Transportation Plans Officer for the 22nd Support Command and was heavily involved in all aspects of planning and coordinating theater ground transportation operations.

This personal experience monograph is intended to provide the reader, specifically those who might be involved in planning or executing future ground transportation operations a first hand account of what was done during Operations Desert Shield and Desert Storm. This monograph will cover problems encountered, how they were resolved, and what lessons for future operations warrant further study. The author has drawn upon his personal recollection, compiled records of events, After Action Reports,

plans he assisted in developing and briefings given by him in the writing of this monograph. Therefore, only a limited bibliography and endnotes are used.

Chapter 1

Introduction

> *A well equipped and organized transportation service is a necessary adjunct to every army in the field, and its absence...has resulted in more disasters and defeats and unsuccessful marches and campaigns than perhaps any other cause.*
>
> —Lieutenant Colonel Charles G. Sawtelle
> in a report to the Quartermaster General, 1884.

Modern warfare is defined by logistics support. Transportation is the backbone of logistics and thus defines logistics support. To understand transportation is to understand logistics and thus to understand war. Great warriors of the past did not, and the great warriors of the present and future will not succeed without superior transportation support. Whether it is packhorses, and mule and horse drawn-wagons depended upon by General George Washington and his Continental Army, or the thousands of trucks of the Red Ball Express depended upon by General George Patton and his 3rd Army in World War II, or the countless trucks depended upon by General H. Norman Schwarzkopf and his forces in the Persian Gulf War, effective transportation has always been one of the essential elements for tactical success in all our nation's wars.

Operations Desert Shield and Desert Storm were no exception, as they also relied heavily upon transportation. These operations presented the U.S. Department of Defense with one of the greatest transportation challenges in history. Ground transportation would be needed to preposition over 300,000 tons of supplies in logistics bases up to 528

miles away from the theater sea ports of debarkation. Also, the simultaneous movement of two Corps involving 64,000 wheeled and tracked vehicles and 225,000 soldiers, a distance over 300 miles in 21 days into attack positions, and the concurrent movement of other support requirements all depended on ground transportation. This would become the largest time constrained battlefield movement ever recorded..[1] To place this challenge in perspective, in little more than a seven-month period, more than 544,000 tons of supplies were airlifted, and more than 3.4 million tons of dry cargo, and over 6.1 million barrels of petroleum products were moved by sea. By comparison, cargo delivered during the Persian Gulf Conflict was greater than the cargo moved across the English Channel to Normandy in support of the D-Day invasion during a comparable seven month period, and significantly exceeded the more than 2.3 million tons of coal, food, and medical supplies that had been moved to West Berlin during the Berlin Airlift, or "Operation Vittles".[2]

The strategic airlift and sealift used to move this cargo departed from multiple ports of embarkation in the United States, however, everything arriving in Saudi Arabia came to only two primary seaports: (Port of Ad-Dammam and Port of Al-Jubayl), and one primary airport, Dhahran Air Base. Once this cargo was received and downloaded at these ports, ground transportation was the primary conveyance used to distribute it to various logistics bases within the theater. Ground transportation operations were a key part of the overall theater logistics functions required to support Operations Desert Shield and Desert Storm.

Responsibility for developing and executing the theater logistics concept of operation rested with Lieutenant General William G. (Gus) Pagonis, Commander of the

22nd Support Command. Pagonis arrived in theater on 8 Aug 90 as a Major General, and was promoted to Lieutenant General on 12 Feb 91. Responsibility for the transportation portion of this logistics operation rested with Brigadier General David A. Whaley who served as Pagonis' Assistant Chief of Staff for Transportation. BG Whaley actually arrived in theater as a Colonel (Promotable) on 11 Aug 90 and as Commander, 7th Transportation Group. A couple months after arriving in theater, Colonel Whaley relinquished command of the 7th Group to Colonel Daniel G. Brown and Whaley moved to his new job as SUPCOM Assistant Chief of Staff for Transportation.

The major units involved in executing the intratheater ground transportation operations were the 7th Transportation Group, an Active Component unit from Fort Eustis, Virginia, and the 32nd Transportation Group, a Reserve Component unit from Tampa, Florida, commanded by Colonel Michael T. Gaw.

The theater logistics concept to support Operations Desert Shield and Desert Storm was divided into six phases: Phase A–Prepositioning, Phase B–Movement of the two Corps, Phase C–Ground Offensive, Phase D–Defense of Kuwait, Phase E–Redeployment, and Phase F–Restoration of Kuwait. Ground transportation operations proved to be a crucial element during each of these phases.

In the pages that follow, the author recounts his experience planning and coordinating ground transportation support during Operations Desert Shield and Desert Storm. In the process, several other issues are also illuminated, to include: the significant role of intratheater ground transportation during each phase of the theater logistics operations, what problems were encountered during the planning and execution of intratheater ground transportation operations, and more importantly, how were these

problems resolved? What would have been the impact of ground transportation had the ground war lasted much longer than 100 hours? What are some of the unresolved issues, which might affect future intratheater, ground transportation operations and why are these key to future warfighters?

Notes

[1] See *Spearhead of Logistics : A History of the Transportation_Corps*, (King, Biggs, and Criner, 1994: 412).

[2] Ibid, page 412-413.

Chapter 2

Prepositioning

Transportation – Nothing happens until something moves.

—U.S. Army Transportation Corps Adage

Undoubtedly, existing transportation doctrine provided a point of reference and the framework upon which an effective ground transportation system could be built. However, the theater was developing so rapidly that during the early phases, planners and operators simply had to provide continuous transportation support the best way they could.

But even during this period of rapid growth and expansion, a system to assure centralized management of ground transportation operations was being established. When the SUPCOM Commander, Major General Pagonis, appointed Colonel (Promotable) Whaley as Deputy Commanding General for Transportation, this assured the theater a single point of contact for all transportation issues. Additionally, Major General Pagonis established a special logistical planning cell at the SUPCOM level which brought logistics planners with varied areas of expertise together to flesh out the theater logistics concept of operation. This assured the development of well-integrated and executable plans. Furthermore, many of the planners would later serve as "Ghostbusters", i.e. troubleshooters, during the execution of the plan. These "Ghostbusters" were functional area experts and served as the commander's eyes and

ears throughout the battlefield to ensure plans were properly executed and the commander's intent carried out. The "Ghostbusters" proved extremely valuable to ground transportation operations, in many cases identifying and fixing minor problems before they became major problems.

Prepositioning was the first phase of the theater logistics operation and the challenge to ground transportation (austere road conditions, great distances, harsh desert environment, shortage of trucks and drivers, communications shortfalls, equipment accountability etc.) during this phase was significant. This phase focused on the reception and onward movement of forces to their initial assembly areas. Also, during this phase, thousands of tons of supplies had to be moved from the ports of debarkation to forward logistics bases.

During this early phase of the operation the vast majority of units arriving in theater were combat arms. This presented a problem not only for ground transportation but also for logistics operations in general. According to Lieutenant General Pagonis, when the president approved the deployment of troops to the Middle East, Generals Powell (Chairman, Joint Chiefs of Staff) and Schwarzkopf (Commander in Chief, Central Command), specifically and immediately ordered in combat troops to deter a further Iraqi invasion. As a result the standard order in which units are sent into combat was resequenced. The combat troops moved up the list and the logisticians moved down.[1] This decision resulted in thousands of combat troops and hundreds of pieces of combat equipment arriving in theater with very little external logistics capability to provide support.

Details are important to an understanding of the many problems ground transporters encountered and therefore, throughout the remainder of this paper, I am going to spell out all the details as appropriate. Almost all Army units have some amount of organic logistics and transportation capability. In fact, many combat units such as tank, mechanized infantry, and artillery are equipped for full mobility with enough organic trucks along with their tanks, armored fighting vehicles, and artillery prime movers to move the entire unit and a basic load of supplies at one time. It's important to note that this full mobility capability assumes the tracked vehicles of combat units will move under their own power. However, during Operations Desert Shield and Desert Storm, the long distances these vehicles would be required to move from the ports of debarkation to the tactical assembly areas (TAA) and logistics bases, coupled with the poor road conditions, simply made it impractical for them to move under their own power.

Two primary routes were identified as main supply routes (MSR) from the ports of debarkation to the TAAs and logistics bases. The two MSRs were referred to as the either the northern or southern route. Although the distance along the northern route from the ports of debarkation to the TAAs and logistics bases was shorter than the southern route (334 miles versus 528 miles), travel time by truck was about the same because of the much better road conditions along the southern route.

The southern route ran westward from Dammam/Dhahran to Riyadh and then north to King Khalid Military City (KKMC) and an intersection with the northern route just west of the town of Hafr Al Batin. This route was characterized by a stretch of four lane, interstate type highway for the first 228 miles (to Riyadh), while the remainder of the

route from Riyadh north consisted of two-lane highway with moderately wide graded shoulders for a distance of approximately 300 miles.

The northern route ran from Dammam/Dhahran to Al Jubayl and then northwesterly to the towns of Hafr Al Batin, Rafha, and beyond. This northern route consisted of a stretch of four lane, interstate type highway for a distance of approximately 84 miles; this highway then became a narrow two-lane road for the remainder of approximately 250 miles. Also, the two-lane portion of this route had no lights and was in a poor state of repair with narrow to nonexistent road shoulders.

Because of the long distances involved and the arduous driving conditions, it was impractical for the combat equipment to complete this move from the ports of debarkation to the TAAs under its own power. The concern was that the wear and tear on the combat equipment caused by moving such long distances would create additional maintenance problems thereby rendering the equipment incapable of engaging in immediate combat should the need arise. The 6-day Arab/Israeli War of 1967 had clearly demonstrated the problems of moving combat equipment great distances under its own power in a desert environment. During this war, every Israeli tank had a transporter to move it to the frontline deployment area, while the Arab opposition had no transporters. Israeli tank brigades arrived battle-ready; Arab tanks arrived with dust-clogged engines, debris-filled tracks, and tired, over-heated crews. They arrived on the battlefield with only one-half to two-thirds of their strength because of mechanical breakdowns along the way. Israeli tanks were transported overnight from one sector of the battlefront to another; Arab tanks lumbering along the roads made easy targets for Israeli fighter-bombers.[2] Thus, transportation planners for Operations Desert Shield and Desert Storm

recognized early on that a great amount of ground transportation support would be needed to satisfy movement requirements and to maximize the maintenance readiness of combat systems. However, because of the decision to bring in primarily combat troops, U.S. ground transportation capability in theater during this phase of the operation was severely limited.

As a result, ground transportation operations relied initially on host nation contract commercial assets. Civilian drivers from several different countries, operating a wide variety of flatbed trucks, heavy equipment transporters (HETs), and lowbed transporters (lowboys) performed the crucial task of moving unit equipment and supplies from the ports of debarkation to TAAs and logistics bases during this phase of the operation.

Responsibility for supervising this operation fell to the 7th Transportation Group. The 7th Group was actually organized, trained and equipped as a Terminal Group and specialized in performing terminal or port operations. A Terminal Group is responsible for the operation of water terminals, air terminals, and transfer points. These responsibilities include documenting, loading and unloading cargo at water and air terminals and transfer points. Responsibility for the onward movement of this cargo within the theater normally falls to a transportation mode operator, usually a Motor Transport Group. [3] However, because the 7th Transportation Group (Terminal) was the first and only major transportation unit in theater during the early stage of Operation Desert Shield, they had to perform both terminal and ground transportation missions. One would have thought that since 7th Group was operating somewhat out of its element, this would have caused problems. In reality, the 7th Group quickly adjusted to this new mission and due to the determination of everyone involved, they succeeded magnificently

in performing both terminal and motor transport missions. It was not until December 1990, that the 32nd Transportation Group (Composite) would arrive in theater. Eventually, the 32nd Group would take over much of the responsibility for ground transportation.

It was recognized early on that ground transportation operations would require a vast number and variety of trucks and truck drivers. An all out effort was launched to bring as many truck units into theater as quickly as possible. Because positioning the heavy equipment of the armored and mechanized units coming into theater would require a significant amount of heavy lift assets. A particularly intensive effort was conducted to get as many heavy lift assets (HETs and lowboys) into theater as possible. Realizing that the U.S. Army's inventory of heavy lift assets was very limited; a concerted effort was made to contract as many of these assets from host nation sources as possible. Also, efforts were made to acquire additional assets from other countries such as Germany, Egypt, Italy and Czechoslovakia as well as commercial truck companies within the U.S.

One of the first lessons learned during the prepositioning phase was the need to ensure capability requirements were clearly identified when contracting assets. Transportation planners considered only vehicles capable of transporting the M1 tank as HETs. However, because this wasn't specified when contracts were developed and executed, roughly 50 percent of the initially contracted vehicles provided as HETs were incapable of transporting the M1. Again, this severely limited the SUPCOM's ability to move heavy equipment from the ports to the initial assembly areas and beyond.

Another challenge facing transportation planner and operators during the Prepositioning phase was site selection and placement of truck units and trailer transfer

points (TTPs). Truck units provided the assets for moving the materials needed to conduct combat operations and would prove to be the backbone of the theater distribution system. The 7th Transportation Group (Terminal) was the only transportation group in theater during the Prepositioning phase. The 7th Group deployed with two of its assigned four battalions, 10th and 24th Transportation Battalions. The 10th Battalion had responsibility for operating the Port of Jubayl, while the 24th Battalion operated the Port of Dammam. Also responsible for ground transportation operations, the 7th Group was assigned three truck battalions (68th, 180th and 419th Transportation Battalions) for performance of this mission. Additionally, the 7th Group formed a provisional battalion (702nd) to provide command and control of the commercial contracted truck assets. The initial positioning of truck units placed the 419th in the vicinity of the Port of Dammam the 180th in the vicinity of the Port of Jubayl, the 68th along the southern MSR in the vicinity of Riyadh and the 702nd Battalion was split between the Ports of Dammam and Jubayl.

TTPs were established to provide locations at which the truck units of different motor transport battalions dropped loaded trailers, picked up empty trailers, and went back for another load. Loaded trailers would be picked up by a different truck unit and moved further forward, ultimately to the final destination. This system maximized transportation capabilities by assuring loaded trailers were constantly moving forward to the final destination and empty trailers were being returned to their points of origin for additional loads.

The challenge was to establish within a few weeks, a transportation distribution system within Saudi Arabia, which was similar to the distribution system used by U.S.

Forces in Europe, which had evolved over the 40-year period since the end of World War II. The distribution system used in Europe was a model because it was what both logisticians and tacticians were familiar with. The functions of the distribution system in Saudi Arabia were very similar to the existing system in Europe. Maximizing transportation capability was the key factor in determining the best locations for placement of transportation units. During the early stages of Operation Desert Shield, units were placed primarily along the shorter northern route. However, as the theater logistics plan evolved, the decision was made to reserve the northern route primarily for movement of unit equipment. Also, because the commercial contracted trucks were not scheduled to use the TTP system, they would also travel along the shorter northern route.

Initially, TTPs were established in the vicinity of Dammam and Riyadh. However the distance between these TTPs was approximately 225 miles due to the limited number of TTP units available in theater during this stage of the operation.. According to Army doctrine, TTPs are normally positioned at 90-mile intervals along the MSRs. The intent is to allow trucks to make two trips between TTPs per 20 hour operating day Also, because TTP units are only authorized 16 soldiers for a single shift operation and can process up to 125 trailers per day, it was necessary to combine two TTP units at each location to ensure they had the capability of handling the anticipated heavy flow of trailers and could accommodate around the clock operations. However, the initial distance between the TTPs resulted in truck drivers completing only one trip per day rather than the optimum two trips This limitation reduced the overall efficiency of ground transportation operations.

As more TTP units arrived in theater, they were positioned along the southern MSR and the distance between TTPs was reduced to 125 miles. Eventually, there were four TTPs positioned along the 525 miles of the southern MSR, and a fifth TTP was positioned along the northern MSR in close proximity to the forward logistics bases. These additional TTPs positioned at closer distances allowed truck drivers to complete two trips per day between each site and had a very positive impact on maximizing cargo-hauling capability. The shorter distances between TTPs also enhanced safety and saved truck drivers from "burnout".

Although the majority of supplies would move through the TTP system, a rail line from Dammam to Riyadh was also used to move some sustainment cargo. Because of the time consuming effort to meet blocking and bracing requirements (securing the equipment to the railcar to facilitate travel) inherent in loading rail cars, a decision was made to use the train to move only containerized cargo. Containers did not require extensive blocking and bracing and could be quickly loaded and off-loaded from the rail cars. The rail line provided a capability to move 150, forty-foot containers per day on two trains consisting of 75 gondola cars each. Gondola cars were ideal for transporting containers; they were flatbed cars with completely open tops, with side and end enclosures that came up to about half the height of the containers.

The motor transport requirements of moving the containers from Riyadh to the forward logistics bases, a distance of over 300 miles were still significant. Commercial contracted trucks were used to meet most of these requirements. Because of the limited availability of trucks and the ever-increasing movement requirements, transportation planners considered expanding the use of rail to move cargo. However, expanding the

use of rail would have required the time consuming task of constructing a rail line from the seaports or from Riyadh to the forward logistics bases. The difficulties associated with this task soon caused this idea to be abandoned. However, had ODS2 became a protracted war, it may have been worth the effort to pursue expanding the use of rail. Without question, expanding the use of rail transportation would have reduced the requirement for trucks. And although rail lines are rather easily interdicted, the air superiority and eventual air supremacy enjoyed by U.S. and Coalition forces would have assured uninterrupted movement.

As the deployment of U.S. forces to Saudi Arabia continued, more logistics units, especially transportation units started arriving in theater. However, just as transport capabilities increased, so did the transport requirements. Forward logistics bases were being established in the northern areas of Saudi Arabia to support the rapidly expanding ground combat forces and preparations for anticipated future ground combat operations. Stockage objectives for the vital classes of supply (Class I: water and food; Class III: packaged and bulk petroleum; and Class V: ammunition) were established for each of the forward logistics bases. Stockage objectives were also established for the other classes of supply, however, considering the limited amount of transportation capability, the top priority for movement was Class I, III, and V, those things essential for the conduct of combat operations. The objective was to stockpile 60 days worth of supplies at each logistics base.

Transportation capability directly impacted how quickly the stockage objectives could be accomplished. However, the ability to move cargo was based on more than just the availability of trucks. Transportation planners had to consider the total cargo

distribution system, and the impact of the harsh climatic conditions upon operations. Upload capability at points of origin, as well as reception and download capability at destinations were among the critical elements affecting the distribution system. Limited quantities of material handling equipment (MHE), especially rough terrain cargo handlers, had a negative impact on the overall ability to move supplies.

Movement of unit equipment was somewhat delayed because of the extremely hot temperatures (120 degrees F or higher) during the period of August to November. HET convoys moving M1 tanks and other combat vehicles had to be limited to night-time operations, because tires on the HET trailers loaded with M-1 tanks weighing in excess of 60 tons, exploded when run in the heat of the day.

Finally, the distribution system was negatively affected by the availability of truck drivers. Usually, most truck units are assigned one driver per truck. However, because of the great distances involved in this theater, a minimum of two drivers per truck was needed to maximize efficiency and to assure safe operations. In reality, there were not enough truck drivers available to even provide one driver per truck. In order to alleviate this problem, senior Army leaders decided to retrain some combat soldiers to perform truck driver duties. The 3rd Battalion, 2nd Air Defense Artillery, an Active Component unit from Fort Lewis, Washington, and an Infantry Company from the Berlin Brigade out of Germany were retrained as truck drivers. These retrained and reorganized air defenders and infantrymen were assigned to the 7th Transportation Group and operated a variety of trucks donated by several foreign countries. The addition of these approximately 1000 soldiers greatly eased the driver shortage problem and helped

improve the overall distribution system. The shortage of MHE would remain a problem throughout the war.

One of the most successful initiatives during the Prepositioning phase, was the establishment of Convoy Support Centers (CSCs) which significantly enhanced ground transportation operations. The Army's version of civilian truck stops, CSCs were established along both the northern and southern MSRs at distances of approximately every 150 miles. These CSCs were operated by Area Support Groups and provided essential services for vehicles and drivers. Services included refueling capabilities, high demand repair parts, maintenance and recovery capability, medical aid, sleeping accommodations, latrines, showers, hot food and hot and cold beverages. Undoubtedly, the food was the biggest hit with the soldiers. It was a tremendous morale booster for soldiers to enter a CSC and among all the other services available, be able to get a hamburger, hot dog, chips and a cold soda or hot coffee. For those with a more hearty appetite the CSCs also provided a variety of microwave type dinners, fresh fruits, fruit juices, milk and various snack cakes. The CSCs provided all the essential services to keep the transportation system moving and enhanced safety by serving as rest stops for drivers.

It's important not to confuse CSCs with TTPs. They were two separate operations. The TTP operations focused specifically on the transfer of trailers between units of motor transport battalions and provided limited trailer maintenance, fuel and life support for truck drivers. CSCs, on the other hand were not at all involved in trailer transfer operations, but focused entirely on technical service support to sustain all movements conducted on the MSRs.

Another very beneficial activity conducted during the Prepositioning phase, which set the stage for successful future operations, especially transportation operations, was a two-day Logistics Exercise (LOGEX). MG Pagonis conducted this LOGEX just prior to the start of Phase B–Movement of the Corps. Participants in the LOGEX included all SUPCOM subordinate commanders and primary staff officers down to battalion level, Command Sergeant Majors, key commanders and staff officers from both VII and XVIII Corps, and key staff officers from Army Central Command (ARCRNT).

The LOGEX started with MG Pagonis providing a broad overview of his intent and concept for providing theater logistics for the upcoming Operation Desert Storm. Commanders and staff officers from every level spent the next 24 hours coordinating and finalizing every detail of plans and concepts for future operations. The following day, every SUPCOM 0-6 and 0-5 commander provided a detailed briefing on their concept of operation for performing all assigned tasks. One of the key events coordinated during this LOGEX was the transportation plan to move the two Corps while continuing to move sustainment supplies. Any required decisions were made right on the spot and no one was released until all coordination problems were resolved.

Finally, just prior to the start of Phase B, MG Pagonis conducted a detailed briefing to SUPCOM company commanders on the overall concept of theater logistics operations and expected standards of performance. The groundwork of the Prepositioning phase was now complete. Key personnel were all aware of the upcoming requirements, the concept of operation, and more importantly, had enough information to execute their daily missions, even if for some reason they could not receive further guidance. Although Phase A, Prepositioning, was not yet complete, the stage was now set to start

the even more challenging Phase B, Movement of the Corps. It was quickly realized that because of the rapidity of this operation, logisticians would end up executing several phases simultaneously.

Notes

[1] See *Moving Mountains-Lessons in Leadership and Logistics from the Gulf War* (Pagonis, 1992 : 89).

[2] See article by As Alicia E. Sack, "HET [Heavy Equipment Transporter]: A Tank's Best Friend" *Army Logistician*, March – April 1984:24

[3] See Army Field Manual 63-5, 22 Feb 85: 6-2)

Chapter 3

Movement Of The Corps

Absolutely an extraordinary move, I can't recall anytime in the annals of military history when this number of forces have moved over this distance to put themselves in a position to attack...It was an absolutely gigantic accomplishment, and I can't give credit enough to the logisticians and transporters who were able to pull this off.

—General H. Norman Schwarzkopf, 1991

Phase B, the movement of XVIII Airborne and VII Corps westward from the ports and initial assembly areas of Saudi Arabia presented an operational level transportation challenge unequalled in history. Never before had a U.S. Army force of its size been moved in so short a time over such a great distance on the battlefield. Needless to say, because something was about to be attempted that had never been done before, there was considerable apprehension by everyone involved. However, this apprehension was no greater than the normal friction and fog of warfare. In fact, it was probably a good thing because it caused everyone to scrutinize closely every painstaking detail of all the plans. This close scrutiny helped ensure the development of only the most feasible plans.

The initial guidance from General Schwarzkopf called for the two Corps to start a simultaneous movement coincident with the start of the air campaign. The movement was to be completed within a 14-day period. The VII Corps would conduct a cross-country tactical movement using only its organic heavy lift assets. The XVIII Airborne Corps movement would be conducted over the MSRs and would require considerable

augmentation with Echelon Above Corps (EAC) transportation assets. Also, while the two Corps were moving into position, transportation planners had to ensure road space was allocated for the continuing movement of sustainment cargo to be prepositioned in the forward logistics bases.

Prior to the start of the Corps movement, sustainment cargo had only been prepositioned in four forward logistics bases: Alpha, Bravo, Delta, and Echo. Logistics planners at ARCENT and SUPCOM felt very strongly that it was critical to start building a fifth forward logistics base, Charlie prior to the start of the Corps movement and the air campaign. Logistics base Charlie was to be located in the extreme northwestern portion of Saudi Arabia and would be in direct support of XVIII Airborne Corps during the ground offensive. The logisticians knew how difficult it would be to get road space for trucks moving supplies once the two Corps started their movement. However, it was important for logistics base Charlie to be fully stocked by the time the Corps movement was complete in order to provide the necessary support for execution of ground offensive operations. During Operation Desert Shield, XVIII Corps had been supported from logistics base Alpha, which was further south in Saudi Arabia. VII Corps would continue receiving it's support from logistics base Echo in northern Saudi Arabia during the ground offensive. Logistics base Delta was further south in Saudi Arabi and was stocked primarily with precision guided munitions to support both Corps. Finally, logistics base Bravo was located near KKMC as a theater logistics base to serve as backup to both Corps logistics bases.

When this concept was briefed to General Schwarzkopf, he liked everything except the desire to start building logistics base Charlie prior to the air campaign. He

immediately expressed his opposition to this idea. He stated in the strongest of terms that building of logistics base Charlie would not start prior to the air campaign and the movement of the Corps. He made one statement that cleared any doubt from the minds of everyone present – "How many American and Allied soldiers lives are you willing to sacrifice to start building Charlie before the start of the air campaign?" After that statement, total silence fell over the room and one could sense that everyone had gotten the message. General Schwarzkopf went on to explain that large scale movement of troops and supplies along the long road west to logistics base Charlie would give away our strategy and cause the Iraqis to shift their positions directly into the path of one of our axes of advance. With this firm guidance, logistics planners began finalizing all the details to make Corps movement happen in the time period specified.

The planning effort for this movement was intense. Initially, the majority of the planning was done by a small group of three officers and an NCO working in the SUPCOM Logistics Planning Cell. All planning was closely coordinated with logisticians and tacticians from both VII and XVIII Corps. About the same time the planning for the movement of the Corps started, the theater's second Transportation Group Headquarters (32nd Transportation Group) started arriving in theater. The 32nd Transportation Group (Composite) was an Army Reserve unit out of Tampa, Florida. As a Composite Group Headquarters, the 32nd was organized, trained, and equipped to supervise terminal, motor, and rail transport operations.

One of the first concepts developed was to assign motor transport battalions to the 32nd and task organize them to move an Army division in a single lift. After realizing there would not be enough transportation assets to move a division in a single lift, the

focus shifted to moving a brigade in a single lift. However, after coordinating with the planners from VII and XVIII Corps, it was clear that the two Corps preferred to consolidate transportation assets, and to retain the flexibility of employing these assets to meet their movement requirements according to the priorities established by the Corps Commanders. Therefore, the Corps planners eagerly accepted the concept of SUPCOM providing an entire Transportation Group to focus specifically on performing their movement requirements.

The basic concept at this point was: SUPCOM would provide the 32nd Group to support the movement of XVIII Airborne Corps, VIII Corps would conduct a cross-country movement using their organic transportation assets, motor transport units from the 7th Group and commercial contracted trucks would continue moving supplies, multiple routes would be used and all elements would be assigned a block of time in which they were allowed to move on the MSRs. Planners continued to wrestle with the requirement to complete the movement of the two Corps within 14 days. After analyzing every movement concept imaginable, it was finally concluded that the move could not be completed in 14 days. Even with continuous around-the-clock movements, the two primary MSRs simply did not provide enough highway space to complete all the movement requirements in a 14-day period.

About two weeks prior to the anticipated movement day, a new movements planning group was formed. The idea behind forming this new group was to have a fresh set of eyes take a look at the requirements and see if they could possibly develop a plan to meet the 14 day timeline. This new group consisted of two transportation officers from ARCENT HQTs, a transportation officer from the 32nd Group, and the original

transportation planner from the SUPCOM group. After several days and nights of painstaking, detailed planning, it was finally agreed that the original concept of movement was probably as good a concept as could be developed at that time. The members of the planning group spent the next few days fine tuning the concept, writing the actual movement order, assigning supporting tasks to subordinate units, and identifying the availability of transportation assets to execute the movement. Again, close coordination was maintained with the Corps planners throughout this entire process. After countless hours the movement plan was finally completed.

The effort now shifted to briefing this plan to commanders and getting approval and concurrence from the key players involved. After getting concurrence from VII and XVIII Corps, the approval of Colonel (Promotable) Whaley, MG Pagonis, and, LTG Yeosok, Commander, ARCENT, the plan was presented to General Schwarzkopf. The most critical issue to be resolved was the requirement to complete the move in 14 days. After General Schwarzkopf heard the reasons why the move couldn't be completed in 14 days, he established a new goal of 21 days for completion of the movement. However, General Schwarzkopf was absolutely adamant that the movement must be completed in 21 days. In fact, General Schwarzkopf actually required MG Pagonis to sign his name "in blood" on one of the briefing charts, guaranteeing that this move could be completed in 21 days. Signing this document was really a mechanism used by General Schwarzkopf to put MG Pagonis totally on record with his promise of completing the move in 21 days. MG Pagonis signed the following words on the briefing chart used to depict the movement timeline of the two Corps, "Logisticians will not let you or our soldiers down,

29 Dec 91." General Schwarzkopf promised to keep this signed document in plain view on his desk until the movement was completed.

With the movement plan approved, the effort now shifted to execution. No one knew for sure the exact date the move would start, but the plan was for it to coincide with the air campaign which everyone assumed would start on 15 January 1991. This was the date the President had set for the Iraqi military forces to get out of Kuwait. A few days prior to the anticipated movement date, the XVIII Airborne Corps conducted a movement exercise. Using a scaled map board model and miniature vehicles, the XVIII Corps planners walked through the entire movement plan. Additionally, key players, to include representatives of all the units and staff sections supporting the movement, were required to provide a detailed overview of their concept of support. This exercise, just as the SUPCOM LOGEX, which was conducted earlier, proved very beneficial and served as a rehearsal for the actual movement.

The last requirement completed prior to executing the movement was to ensure the 32nd Group had sufficient trucks to meet the anticipated requirements. XVIII Airborne Corps had an estimated 28,419 vehicles to move. The majority of these vehicles would move under their own power, but their external lift requirements were still significant with 535 HET lifts, 1793 lowboy lifts, and 2815 flatbed lifts. SUPCOM logisticians expressed concern that the XVIII Corps' external lift requirements were so great because they planned to move with more than the doctrinal three days of supplies. Again, this would add an additional strain to an already overburdened transportation system.

The movement plan called for 32nd Transportation Group to provide 280 HETs, 280 lowboys, and 500 flatbeds for a period of 21 days against these movement requirements.

Based on an average travel distance of about 300 miles on the northern MSR and 500 miles on the southern MSR, expected average turnaround time for trucks was three to four days. In other words, one day to load and travel from start point to destination, one day to return to start point, usually one day for driver's rest and vehicle maintenance, and depart with another load on the fourth day. All heavy lift assets (HETs and lowboys) were scheduled to travel the shorter northern MSR, while all other vehicles traveled the southern MSR. Because of the distance on the southern MSR, a "remain over night" had to be programmed into the movement plan.

Although the northern and southern MSRs started out as separate routes, they intersected west of the town of Hafr Al Batin and came together as one route for the remainder of the distance to logistics base Charlie and beyond. This complicated the movement plan because the schedule had to ensure convoys did not arrive at this intersection at the same time. Additionally, the plan had to ensure the VII Corps which was doing a cross-country move had sufficient time each day to allow their vehicles to cross the northern MSR from south to north, and the southern MSR from east to west. The plan also had to provide blocks of time for the continued movement of supplies, especially for the building and stocking of logistics base Charlie. Additionally, because of the concerns over the poor road conditions of the northern MSR and the additional damage that would be caused by the heavy traffic, the plan had to provide daily block times for the engineers to do road repairs.

The march tables to support this movement explicitly outlined block times for all requirements. Determining block time assignments was a very complicated process. The planners had to ensure there were no conflicting movements causing convoys to run into

each other at critical intersection or VII Corps crossing points. The basic block time allocations consisted of XVIII Corps being assigned 16 consecutive hours per day on the northern MSR and two eight-hour blocks on the southern MSR. Transportation planners did all this work by "stubby pencil," because at that time there were no computer software programs for performing this time consuming task. However, in recent years, software programs for movement planning have been developed, therefore, present and future transporters should have a much easier time performing these complicated tasks, even under the most demanding of battlefield circumstances.

The air campaign kicked off during the early morning hours of 17 January 1991, and the much anticipated movement of the two Corps started on the same day. The worst fears of convoys running into each other at critical intersections were never realized. Although there seemed to be a never ending flow of vehicles, the bulk of the convoys moving unit equipment and sustainment supplies continued to move. On 7 February 1991, exactly 21 days after the start date, one of the greatest battlefield movements in history was complete. With the exception of some VII Corps equipment still arriving in theater by ships, the ground forces were now in position to launch a ground offensive on the President's order. Logistics base Charlie also had sufficient supplies stockpiled to assure adequate support to the XVIII Corps.

The success of this movement can be attributed to several factors. The tremendously successful air campaign conducted by U.S. and Coalition Air Forces, assured air superiority, which resulted in freedom of movement on the MSRs. The establishment and operation of convoy consolidation points at origin and destination provided critical rally points to marshal transportation assets. The convoy support centers enhanced safety

and provided the essential services and morale boosters to keep the equipment and soldiers going. The flexibility and responsiveness of mode operators ensured all requirements were accomplished. Finally, the spirit and determination of soldiers and civilians, especially truck drivers, to include hundreds of civilian drivers; Pakistanis, Bangladeshis, Filipinos, Bengalis and others who operated the leased trucks, all played key roles in assuring the success of this movement.

Once the forces were in position, the focus now shifted to intense preparation for the ground offensive. Although all the forward logistics bases had the minimum stockpiles of supplies that would be needed to execute the ground offensive, a tremendous amount of supplies still needed to be moved to bring these logistics bases up to optimum stockage levels. Since there were now two Transportation Groups in theater, the decision was made to have the motor transport assets of the 7th Group operate alone in the southern half of the distribution system. They would deliver supplies from the ports in the southern part of Saudi Arabia to as far north as logistics base Bravo, which was located just south of (KKMC). The motor transport assets of the 32nd Group would pick up the supplies from logistics base Bravo and move them further north to logistics base Echo which supported VII Corps, and logistics base Charlie which supported XVIII Corps.

During this period there was a never-ending flow of vehicles moving supplies along the MSRs to the logistics bases. No one knew for sure the exact date the ground offensive would start, but the intent was to preposition as many supplies forward as possible to ensure the fighters had everything they needed to sustain what everyone anticipated to be a very intense ground battle. Although a tremendous effort was being made to move supplies, this movement was affected by several problems. Most of the

problems were inherent to the theater in which operations were taking place. Long lines of communications, poor road conditions, very challenging climatic conditions, and the aggressive driving habits of the locals were beyond the immediate control of anyone. However, there were a number of problems which could be fixed and it is important to address the two most significant ones at this point.

One problem, which had a tremendous adverse impact upon command and control capability, was lack of adequate communication assets. The authorized FM radios proved inadequate to meet requirements. The great distances between units and the hundreds of miles convoys had to travel away from their base sites simply exceeded the FM radio range which was about 30 miles. The most reliable means of communication were cellular telephones. However, because there was such a limited supply of these phones, they were usually only issued to battalion and higher level commanders. Since battalion commanders do not often accompany truck convoys on their mission, this meant that once convoys went outside the range of FM radios they were without external communication capability. The lack of communications capability directly contributed to enemy capture of the Transportation Corps' only two prisoners of war during ODS1 &2. As Specialist Melissa A. Rathbun-Nealy and Specialist David Lockett of the 233rd Transportation Company were driving their HET from a mission at Dhahran Air Base, they became disoriented and got off the MSR. Proceeding along the coast of Saudi Arabia toward Kuwait, the soldiers were unable to reestablish their correct direction. Without any communication capability, they were unable to communicate with higher headquarters for additional guidance and mistakenly drove into occupied Kuwait where Iraqi soldiers captured them.[1] In addition to individual drivers getting lost, lack of

communications assets also resulted in entire convoys sometimes getting lost and valuable cargo being delivered to the wrong destination.

Flexibility in the distribution system was also severely strained because of inadequate communication capabilities. For example, should the priorities change after a convoy had already departed a location, it was impossible to notify the convoy commander of the necessity to deliver to a different location. In response to this problem, many truck drivers purchased inexpensive citizen band radios that gave them the capability of communicating with other trucks in the convoy, and over limited distances, to communicate with their base. Still, no real solution evolved to provide dedicated communications to the transportation network.

However, the rather recent fielding of the Global Positioning System provides transportation units the much-needed capability to know where they are in a featureless desert. Additionally, transportation truck units have recently been authorized additional radios with a much greater range capability. Finally, the on-going Army Warfighter's Experiment being conducted with the 4th Infantry Division (Mechanized) at Fort Hood, Texas is testing the latest technical systems designed to provide commanders with total situational awareness on the battlefield. One of the systems being tested which promises to greatly aid transporters is the Movement Tracking System. Trucks installed with this system are capable of communicating via computer over unlimited distances to any other site with a similar system. Additionally, command centers with this system will have total visibility over assets anywhere on the battlefield at all times.

Undoubtedly the greatest problem which adversely affected the distribution system, was the loss of trailers. The trailer problem became so critical that the movement of

supplies by SUPCOM motor transportation assets almost came to a complete halt. Two factors caused this problem. First of all, it was quickly discovered that many of the SUPCOM trailers which were used to deliver supplies to the VII and XVIII Corps logistics bases were being kept by these two Corps and being used as mobile storage assets. However, it was also quickly discovered that convoy commanders failing to maintain positive control and enforce procedures within their convoys contributed to this problem. For example, some convoys would routinely deliver loaded trailers to logistics bases and then would depart without trailers, even though empty trailers were available to be pulled back.

Another issue, which contributed to the trailer problem, was the lack of sufficient or adequate yard tractors at the TTPs located near the logistics bases. TTPs use yard tractors to stage trailers in centralized locations according to their destination. This makes it convenient for truck drivers to drop off one trailer, and immediately pick up another without having to search across the TTP site to find a suitable trailer. The TTPs had their authorized number of yard tractors, based on a doctrinal capability of processing up to 125 trailers per day. However, in this theater, the daily flow of trailers into TTPs often exceeded 300. Also, the yard tractors authorized to the TTPs were the commercial types designed for on-road operations. Tactical tractors would have been much better in this desert environment.

As a result of the problems with yard tractors, the TTPs were unable to keep up with the requirement of staging trailers in central locations. This caused drivers to waste valuable time searching these sites trying to find trailers. Once a trailer was found, there was no guarantee it would be mission capable because mechanics were only checking

those trailers placed in a central location. Rather than endure this frustration many drivers would simply return to their point of origin without a trailer.

The trailer accountability problems were very perplexing, and transportation planners tried several different solutions. The first attempt at fixing this problem was to place more emphasis on movement control teams (MCTs) managing what was moving through the logistics bases. First Destination Reporting Points (FDRPs) were established near the entrance and exits to all logistics bases. Staffed by logisticians of the Theater Material Management Center (TMMC), and augmented by transporters from the MCTs as well as military police, the FDRPs launched an all-out effort to account for the SUPCOM's trailers. Despite this effort, the FDRPs had only a minimal impact on fixing the trailer problem. Lack of movement personnel, convoy control, multiple destinations of trucks within convoys, and uneven turnaround times made it impossible to keep a detailed account of the trailers.

The next proposed solution was implementation of a theater movement program, which transportation planners called an apportionment plan. The goals of the apportionment plan were: identify all EAC transportation assets, identify all known and anticipated transportation movement requirements, match assets with requirements, and establish realistic movement objectives for motor transport units down to battalion level.

Battalions were assigned specific and recurring requirements over the same route for a seven-day period. The idea behind assigning requirements to battalions was to ensure units could conduct movements with appropriate leaders accompanying convoys to provide the much needed command and control. The movement objectives established were the result of a collective planning effort by mode operators, material managers,

movement control and staff planning officers. Planning sessions were conducted weekly and at the end of each session everyone had the projected requirements for the next seven-day period.

The apportionment plan provided commanders at all levels with the increased visibility needed to control the flow of supplies, change priorities, and mass assets for a priority move. Additionally, by tracking what was actually moved and comparing it against projected movement requirements, the apportionment plan provided a means of measuring the effectiveness of transportation units in accomplishing movement objectives. MCTs tracked convoys from origin to destination. As convoys departed one location, the MCT at that site would call ahead to the next destination and report the number of vehicles, the type of cargo, the time of departure, and the estimated time of arrival at the next location. Upon arrival at any destination, the convoy commander would report directly to the MCT/FDRP and provide the same information as well as any problems encountered along the route, i.e. enemy activity, road conditions, etc. The MCT/FDRP would provide the convoy commander with information on: back haul requirements, availability of empty trailers, status of road conditions, enemy activity, and any other special requirements such as diversions or changes in priorities. Prior to departure, the convoy commander would check out with the MCT/FDRP and provide information on retrograde loads, empty trailers or problems encountered at the site.

The apportionment plan was only partially successful however, as the development and implementation of this plan came too late. By the time this plan was implemented, visibility had already been lost on over 50% of EAC trailers, and without sufficient trailers, an effective apportionment plan could not be implemented. The trailers had to be

located and recovered. Teams of logisticians set out to search the logistics bases, and to no one's surprise, hundreds of EAC trailers uploaded with ammunition were found in the Corps sectors. Although the trailers were now located, any large-scale recovery was prevented by the rapidly approaching start of the ground offensive.

Despite the problems encountered during the buildup of the logistics bases and movement of two Corps, over 300,000 tons of supplies were moved forward to logistics bases. It was not as efficient as it could have been, and it was not always pretty, but transporters had made it happen. The materials needed to produce the thunder and lightning of Operation Desert Storm had been delivered. However, the ultimate test of how well the transporters had performed their mission would be decided by how well the combat soldiers were supplied when the ground offensive started.

Notes

[1] See *Spearhead of Logistics: A History of the U.S. Army Transportation Corps*, (Kings, Briggs and Criner 1994: 435).

Chapter 4

Ground Offensive and Defense of Kuwait

Victory is the beautiful, bright colored flower. Transport is the stem without which it could never have blossomed.

—Sir Winston Spencer Churchill

By 24 February 1991, the stage had been completely set for what would prove to be a lightning fast ground offensive against one of the largest armies in the world. The challenge facing transporters was how to support the advancing combat forces during the ground offensive. The stockpiles of critical supplies moved into the logistics bases during the Prepositioning phase would contribute greatly to the success of the ground war. However, everyone anticipated these supplies would be quickly consumed, so plans had to be in place to replenish these stockpiles. Also, plans had to be in place to ensure timely delivery of supplies to the combat units who were no longer sitting in static assembly areas, but were rapidly moving great distances across the deserts of Saudi Arabia, Kuwait, and southern Iraq.

Theater transportation planners, after coordinating with planners from VII and XVIII Corps, determined it would be absolutely essential for EAC trucks to get two trips per day between points of origin (original logistics bases) and destination (planned provisional logistics bases) to ensure the requirements of the advancing combat forces would be met. Up to this point nearly all EAC truck operations were conducted on

highways. However, supporting the advancing combat forces during the ground offensive would require truck movements across the desert sands where no highways were available. The terrain these trucks would have to traverse varied from flat, hard, and rocky, to powdery talcum-like sand. Therefore, planners emphasized the need for engineers to construct roads north from the original logistics bases because the majority of EAC trucks were commercial M915 tractors, which could not transport supplies cross-country.

The basic concept for supporting the two Corps during the ground offensive was to augment their organic transportation capability with EAC assets based on their projected requirements. Based on a daily transportation requirement of 10,240 short tons for the VII Corps and 8,040 short tons for XVIII Corps, an agreement was made to provide the following EAC assets in dedicated support: the 766th Transportation Battalion, with its six medium truck companies, was in direct support of the VII Corps. The 185th Transportation Battalion, with its five medium truck companies, was in direct support of the XVIII Corps. In addition, the 369th Transportation Battalion, with five HET companies and an Egyptian HET Battalion with 100 HETs were centrally located to respond to any heavy lift requirements.

The EAC assets, in direct support of the two Corps, fell under the operational control of the 32nd Transportation Group. The other theater transportation group, the 7th Group, continued operating the SPODs and moving supplies along the MSRs to ensure the logistics bases maintained their critical programmed level of supply. In addition to its two terminal battalions and four truck battalions, the 7th Group had picked up the 1103rd Transportation Battalion. Although the 1103rd was originally assigned four truck

companies without equipment, it eventually provided command and control for nearly 1000 HETs and lowboys operated by its assigned soldiers and host nation/third country national drivers. At this point in the operation, the availability of trucks and truck drivers had improved considerably. And although transporters would continue struggling with the shortage of trailers, everything was poised to support the ground offensive.

Planners from the two Corps had identified sites for the new logistics bases, and timelines for the engineers to construct the much-needed roads across the desert. Nearly every available trailer was uploaded with ammunition and EAC trucks were prepared to move when required. Based on the number of trucks and trailers available, the long distances to be traveled, and the estimated high expenditure rate of supplies, especially ammunition, transportation planners had estimated a capability of replacing only one ton of supplies for every three tons consumed from the original log bases. To help offset this shortfall, a decision was made to move the TTPs from the southern MSRs to the shorter northern route.

Everyone was determined to ensure the combat forces had the vital supplies to sustain operations as long as necessary to assure victory. Immediately after the ground offensive started on 23 February 1991, the weather turned rainy and the dirt roads through the desert turned into tremendously muddy trails. Predictably, the commercial M915 trucks were having a very difficult time traversing the muddy terrain. However, through sheer determination on the part of the drivers, the trucks were forced up the muddy trails and supplies reached their destination. As LTG Pagonis points out, "during the entire conflict, not a single mission was cancelled, postponed, curtailed, or even delayed for lack of logistical support."[1]

One hundred hours after the ground offensive started, U.S. and coalition forces had accomplished the military objective of ejecting the Iraqi military out of Kuwait and victory was declared. This lightning quick and overwhelming victory created some additional transportation challenges. Tens of thousands of surrendering enemy prisoners of war (EPW) required transportation to collection points and eventually to EPW camps. Transportation planners had anticipated a high number of EPWs and had intended to transport them on trucks returning from forward logistics bases that had delivered ammunition. However, because the ground offensive ended so quickly, most of the ammunition trucks were never downloaded. Consequently, transporters had to marshal all types of vehicles to move EPWs- school buses, circus trucks and a variety of military trucks were used to meet these requirements.

Another challenge presented by the swift victory was the requirement to return unused supplies to the supply system. Only a relatively small portion of the more than 300,000 tons of prepositioned supplies were consumed during the 100-hour ground offensive. For example, more than 157,000 tons of ammunition would have to be retrograded through the transportation system. Transportation planners immediately started developing plans to assure unused supplies were returned to the supply system.

Although the ground offensive was very brief, several lessons were learned regarding transportation support. The concept of providing EAC trucks in direct support to each Corps proved very effective. With the 32nd Transportation Group (all military trucks) focused specifically on support to the two Corps, the SUPCOM was very responsive to the Corps movement requirements. The 7th Group was allowed to focus solely on ensuring theater sustainment cargo moved from the theater SPODs to the

forward logistics bases. The short duration of the ground offensive probably concealed some potential transportation problems.

However, if the ground offensive had lasted for weeks or months instead of a few days, and the tempo had remained so fast-paced, maintenance problems, driver fatigue and other problems would surely have affected the distribution system. Throughout Operation Desert Shield and Desert Storm, EAC trucks accumulated more than 50 million miles (over 196,000 per day), and maintained an incredibly high mission capable rate of 85 percent or higher. It is doubtful these trucks would have maintained such a high level of readiness in this harsh environment if the tempo had been so fast paced for a longer period of time. The standard mission capable rate for trucks in wartime operations in 75 percent. Also, as previously noted, transporters only had a capability of replacing supplies consumed from the logistics bases on a 1: 3 ratio (one ton replaced for every three tons consumed). At that rate of consumption the two Corps were bound to run out of supplies at some point. Contingency plans were essential to avoid an imminent disaster.

Alternative support plans were constantly being developed and in some cases actually implemented. One of these plans involved the use of Army watercraft from the 7th Group which was moving supplies along a water MSR from the theater SPODs into Kuwait. Army watercraft actually performed 153 resupply missions and moved over 41,890 short tons of supplies.[2]

Another plan implemented to augment the overburdened road network was the development of a flight landing strip (FLS) in the middle of logistics base Charlie. A one-mile portion of the northern MSR was closed off and converted to a landing strip for

C-130 aircraft. The XVIII Corps Engineers built a bypass road allowing traffic to continue flowing around flightline operations. This operation was conducted for about six weeks and was a total success. Nearly 1000 sorties were flown between Dhahran and this FLS, moving more than 9,000 short tons of supplies, 250, 000 gallons of fuel, and 900 passengers.[3] Both the uses of Army watercraft and the FLS played a significant role in augmenting the ground transportation network and assuring the combat forces had the vital supplies needed to assure victory. With the end of the ground offensive, logisticians now shifted emphasis to the next phase, the defense of Kuwait.

Defense of Kuwait was by far the briefest phase of the entire operation. Except for a reduction in requirements, the transportation concept of support for Defense of Kuwait, remained basically unchanged from the concept used during the ground offensive. The same EAC transportation battalions continued to provide dedicated support to the two Corps. In addition to the continued movement of EPWs, the other great transportation requirement during this phase was to assist in cleaning up the battlefield. Although the ground offensive lasted only 100 hours, thousands of enemy tanks, vehicles, and other equipment were either destroyed or abandoned and had to be cleared from the battlefield. Some of this abandoned equipment was transported back to the theater SPODs for shipment back to museums and military installations in the United States and Europe Preparations for redeployment started immediately after the ground offensive ended.

Notes

[1] See *Moving Mountains: Lessons in Leadership and Logistics From the Gulf War,* (Pagonis, 1992:150).

[2] According to a fact sheet, "Logistics Over the Shore Operations During Desert Shield/Storm," prepared by Chief Warrant Officer Four, John Williams, 7th Group Watercraft Officer, dated 27 Sep 91.

Notes

[3] According to a U.S. Army War College paper by Col. Frederick Perkins and LTC (P) John Race, "Moving the XVIII Airborne Corps During Desert Storm: A Personal Experience Monograph," dated 25 May 1994, page 17.

Chapter 5

Redeployment of U.S. Forces and Restoration of Kuwait

The ground transportation support required during redeployment was almost as monumental as that of the prepositioning phase. However, during this phase the requirement was to relocate only one Corps at a time instead of moving both Corps simultaneously as had been done during an earlier phase. The decision was made to have the VII Corps units remain in a defensive position in Kuwait while EAC transportation units focused on assisting XVIII Corps units in moving from their tactical positions to Redeployment Assembly Areas (RAAs).

Based on the earlier success of task-organizing an entire transportation group to move a Corps, the redeployment movement plan was designed around the same model. However, to speed the redeployment, the mission of the theater's two transportation groups was changed. The 32nd Group assumed the entire ground transportation mission to provide lift support to the redeploying Corps, while simultaneously moving the unused supplies back to the theater ports for shipment back to the U.S. The 32nd Group assumed control of all EAC truck assets on 1 April 1991, while the 7th Transportation Group focused on terminal operations at the theater's ports. The stage was now set to actually start moving XVIII Corps units to their RAAs where they could make the final preparations for redeployment.

Building upon the concept of convoy consolidation points (CCPs) used during the initial Corps movement, the XVIII Corps established what they called transportation collection centers (TCCs) as sites to stage heavy lift transportation assets. Just as the CCPs did during the initial movement, these TCCs proved extremely useful and effective in aiding the movement effort. The TCCs served the same function as the CCPs; a rallying point to marshal all transportation assets.

Unlike the initial movement, during the redeployment move, a decision was made to give tasking authority over EAC truck assets to the XVIII Corps Movement Control Center. This decision was possible because XVIII Corps would be the only Corps moving at this time and there would be no competing requirements for EAC trucks from the VII Corps. Coordination between the 32nd Group and XVIII Corps was outstanding and the movement was executed remarkably well. Within a three week period, the entire XVIII Corps had been moved a distance of over 350 miles from their TAAs back to the RAAs in the vicinity of the theater ports to be prepared for shipment back to the U.S.

As the XVIII Corps was moving to RAAs, theater transportation planners were busy devising a plan to move the massive amounts of supplies left in the logistics bases. Representatives from the Theater and Corps Material Management Centers, Movement Control Centers, Theater Movement Control Agency, motor transporter operators, and various staff sections all came together to identify movement requirements and what EAC assets were available to meet these requirements. The ultimate intent was to develop a transportation apportionment plan as had been done during the earlier phase of the operation. Several movement requirements were identified during this meeting; however, not all the material managers were present so not all movement requirements

could be identified. Unable to account for all EAC assets and unable to identify all movement requirements, the idea of developing an apportionment plan was abandoned.

Attention now shifted to finding a way to improve the system for providing centralized management of transportation assets and movement requirements. Although separate organizations already existed to perform these functions, the geographical distance between these units and the lack of reliable communications assets limited their effectiveness. An organization with key players co-located to coordinate asset availability, movement requirements, and asset utilization was needed.

The concept of creating a Theater Distribution Center (TDC) surfaced. Its purpose was to centralize the material management and transportation functions under one roof. The organization would be divided into three functional areas: a material management section, a movement control section, and a mode operator's section. All theater movement requirements would be funneled through this organization. This organization would also be responsible for developing the transportation apportionment plan, monitoring daily movements, maintaining visibility on all theater transportation assets and ensuring the most efficient use of these assets. Overwhelming trailer problems and the speed in which the entire redeployment process occurred, precluded the TDC concept from ever being fully implemented.

The theater's trailer problems worsened. Not only were there accountability problems, with 80 percent of EAC trailers unaccounted for, but serious maintenance problems also started to surface. The trailer fleet was starting to show the strains of continuous months of operation in the harsh desert environment with very little preventive or scheduled maintenance being performed. Although a very feasible concept

for conducting trailer maintenance was developed during the early stages of the operation, it was never fully implemented. The concept called for a maintenance schedule to be stenciled on the side of each trailer. As trailers flowed through the TTP system, the maintenance personnel would check each trailer and annotate on the stenciled schedule any services performed and when the next services were due. Each TTP would also be assigned a quota of a minimum number of services to perform daily. The understaffed and overworked TTPs were never able to fully implement all these procedures.

The numerous mode operators who lost confidence in the TTP system exemplified the severity of the trailer problem. Many drivers bypassed the TTPs to make deliveries to the final destination just to ensure they got their original trailer back. In one instance an EAC convoy was stopped on the MSR by an officer who ordered the drivers to give him the trailers they were pulling. Many poorly maintained trailers were being abandoned on sides of the MSRs and no one could really tell whose trailers they were without a time consuming close examination of the trailer's data plate. Again, during the early stages of the operation, a color coding system assigning identifying colors to each group's trailers was proposed. The headboards of each major unit's trailers would be painted a different color, thus allowing them to be easily identified and potentially, even foster some pride in ownership, which may have helped curtail some maintenance problems. Unfortunately, this simple, and one would think, effective proposal was never implemented on a large scale. The trailer problem was never resolved and remains a problem for future transporters to solve.

As the XVIII Corps redeployed, theater transportation planners started developing plans for the redeployment of EAC transportation units. Because the requirements for transportation had been so great during each phase of the operation, the initial thoughts were to simply hold all transportation units until everything else had redeployed. However, after a closer examination of the overall situation, a decision was made to gradually redeploy the transportation units to coincide with the gradual reduction in movement requirements. As EAC transportation units redeployed, the theater would move back to a situation similar to what existed during the early stages of the operation – heavy reliance on host nation-contracted transportation assets. The final objective was to turn over the entire ground transportation mission to contractors by 1 July 1991. To provide command and control of the contractors, a small cadre of transporters was left to operate the provisional 702nd Battalion and its four truck companies.

As most EAC truck units started making preparations for redeployment, those remaining in theater along with contracted assets, were responsible for assisting in the restoration of Kuwait. These units were tasked to conduct routine resupply missions-moving food, water, and other essential supplies to be distributed to the citizens of Kuwait. Two truck units were actually positioned in Kuwait to assist in the local movement and distribution of supplies.

By early August 1991, the bulk of ground transportation requirements were completed; and for transporters and other logisticians the war could finally end. Contractors took over the remaining theater ground transportation missions and the headquarters of both theater transportation groups completed their redeployments to CONUS. Lieutenant General Pagonis would remain in theater until January 1992 to

oversee the remaining logistical effort of completing the redeployment of units and unused supplies.

Conclusions

Ground transportation operations clearly played a vital role during every phase of ODS1&2. The overwhelming success of this operation can be attributed to many factors; the extremely successful deployment of forces, the tremendous air campaign, the cooperation and cohesion of the coalition, the high level of training and determination of the soldiers and the superior combat equipment, etc. However, as General Schwarzkopf said in a recent interview with *Army Times* magazine, "you can have all the fancy weapons systems in the world, but if you're not capable of delivering ammo, fuel and spare parts to those weapon systems, they will be ineffective."[1]

Clearly, ground transportation operations proved to be the linch pin for the overall success of this operation. Despite the challenges of equipment shortages, personnel shortages, trailer accountability problems, equipment maintenance problems, organizational shortfalls, the harsh and unforgiving desert environment, and the fog and friction of a wartime environment, transporters rose to the occasion and met these challenges with a steadfast determination and unwavering commitment to succeed. However, this review of transportation operations also reveals many challenges, problems and lessons learned that can be applied to future operations.

Operations Desert Shield and Desert Storm produced a "come as you are" war, and transporters took what they had and made the most of it. The transportation problems experienced during this operation have not been lost on Army leaders. Since the end of Operation Desert Storm, many changes within the Transportation Corps have taken place. For example, the old HETs, which were used during Operations Desert Shield and Desert

Storm, have been taken out of the inventory and replaced by a new and much improved "Super HET" which is actually capable of transporting the Army's heaviest equipment. Additionally, the design of the HET units has been completely changed. The HET units participating in ODS1&2 had authorizations of about 150 soldiers and 36 HETs. The newly designed HET units have authorizations of 299 soldiers and 96 HETs. The Army is also taking advantage of technological advances and fielding new and improved communications and Global Positioning Systems to transportation units. The Army's Warfighter Experiment currently being conducted at Fort Hood, Texas is testing a computerized movement tracking system, which promises to provide total situational awareness, and assured communications over unlimited distances. Potentially, this system could be placed in the cabs of all cargo trucks. Work is currently ongoing at the Army's Combined Arms and Services Command to develop and implement new doctrine for the theater distribution system. Even more promising, is the fact that in recent years, truck modernization has become the Army's largest non-combat procurement program. Within the next five years the Army plans to field an entirely new "Family of Medium Tactical Vehicles" to replace the existing fleet of vehicles, many of which are older than the soldiers driving them. These ongoing developments will no doubt be the building blocks for improving transportation support in future operations.

During Operations Desert Shield and Desert Storm, the superhuman effort of many great Americans, Coalition forces, and extraordinary soldiers and civilians, resulted in over 50 million miles driven, over 300,000 tons of supplies moved, and the simultaneous relocation of two Corps over a distance of 500 miles on the battlefield. True to the old adage of the U.S. Army Transportation Corps, "nothing happens until something moves."

Notes

[1]See article, "Truck Modernization" in *Army Times* magazine, dated Oct.6, 1997, page12.

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