

The Evolution of Centralized Operational Logistics

**A Monograph
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Abstract

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This monograph describes the evolution of logistics management at the operational level since the end of the Second World War. Examining the history of how the Department of Defense has organized itself at the operational level to manage logistics in conflicts over the last 50 years will allow sustainment planners to implement the optimal level of centralization in future conflicts. Since the Second World War, the American military has increasingly centralized the management of logistics in order to increase efficiency and reduce overall costs. This monograph demonstrates the increased centralization through the examination of the core logistics functions of supply, maintenance operations, and deployment and distribution during the Vietnam War, Operation DESERT STORM, and Operation IRAQI FREEDOM.

Since World War II, the services have sought the most efficient method to sustain their forces during combat operations on multiple continents far from the industrial base. The Department of Defense has implemented varying degrees of control in the management of common user logistics since 1970, from requiring each service to be responsible for managing their own logistical requirements to centralizing the management of common user items across the services, stopping short of creating a unified logistics command. With inevitable decreases in personnel and funding in the near future and reliance on increased joint operations, it is imperative that the services implement the most efficient management method in order to support combat operations. The trend of increasing centralization of logistics management is evident in the examination of the Vietnam War, Operations DESERT STORM, and Operation IRAQI FREEDOM, but inefficiencies still exist.

This monograph recommends that the Department of Defense continue to centralize its logistics management structure to increase synchronization between the services and create further efficiencies. The Department of Defense must assign responsibility and adequately resource this logistics management organization at the onset of the next conflict or combat forces will experience the same logistics shortfalls as in previous conflicts.

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Introduction

On August 9, 1990, five days after Iraqi dictator Saddam Hussein began his invasion of Kuwait, Major General William G. Pagonis stepped off the plane at Dhahran Airbase, Saudi Arabia. His immediate task was, as U.S. Central Command's deputy commander for logistics, to supervise the movement and sustainment of the rapidly growing American presence in the developing theater of war.¹ Thousands of troops from the XVIII Airborne Corps, Fort Bragg and other posts in the continental United States, had already arrived to defend Saudi Arabia and induce the Iraqi Army to withdraw from Kuwait. The scene on the ground was appalling. Troops flowing into theater slept on any piece of available ground and dug slit trenches for latrines. No one was in charge and coordinating the many supply installations springing up in the cities and deserts. Many combat units did not even have the supply units needed to sustain them in the hostile desert. Troops deplaned directly onto a 140-degree tarmac with no shade or logistical infrastructure, while one lone lieutenant colonel attempted to organize them. Sanitation facilities, cold water, tents, a command and control hub, and military transport means did not exist. The few logisticians on the ground struggled in an attempt to bring order to the chaos. Finally, after four days, and the arrival of several thousand more combat troops, 300 logistics soldiers from the 7th Transportation Group arrived in Dhahran. Although expecting to execute its assigned stevedore mission of unloading ships, the soldiers quickly shifted priorities and began to assist receiving and sustaining the XVIII Airborne

¹ A theater is "the geographical area for which a commander of a geographic combatant command has been assigned responsibility." *Joint Publication 1-02 Department of Defense Dictionary of Military and Associated Terms* (Washington, DC: The Joint Staff, 2010), 336.

Corps, which was already mostly in theater, and the VII Corps and 1st Marine Expeditionary Force, which were both just arriving in theater. A day later, a small force of about twenty officers, whom Major General Pagonis had handpicked, arrived in theater to form his initial staff. They spent the next several weeks scrounging for supplies, food sources, transportation assets, and workers from the local economy to support the several thousand combat troops already on ground until sufficient military sustainment forces arrived in theater.²

The early period of Operation DESERT STORM highlights how the overall management of logistics affected the outcome of a military operation. Sustainment forces execute the necessary support functions, such as providing basic life support, managing supply operations, and staging equipment, that allow the buildup of combat forces in any given theater of operations. In this instance, planners for Operation DESERT STORM decided to assume risk to in order to quickly build combat power and forego the deployment of a proper mixture of logistics troops to support the combat troops, which exacerbated logistical difficulties throughout the war. For example, in the build-up of this operation, the late deployment of sustainment troops, such as truck companies and warehouse operations units, caused a backlog in the receipt, processing, and distribution of supplies throughout the duration of the conflict and negatively affected the ability to provide for the immediate welfare of troops. Although the combat service support forces

² 22D Support Command. *22D Support Command After Action Report Executive Summary Desert Shield/DESERT STORM*. After Action Report (New York: 22D Support Command, 1991), Command Reports 1-10; Lieutenant General William G. Pagonis and Jeffery L. Cruikshank. *Moving Mountains: Lessons in Leadership and Logistics from the Gulf War*. (Boston: Harvard Business School Press, 1992), 84-93; Richard M. Swain, *"Lucky War" Third Army in Desert Storm* (Washington, DC: Government Printing Office, 1994), 35.

eventually overcame their preliminary challenges to provide successful support to the combat mission, initial effective management of the core logistics functions would have greatly enhanced reception of troops, staging of equipment, onward movement to staging bases, and management of supplies in theater.

The term “joint” is defined as “activities, operations, organizations, etc., in which elements of two or more military departments participate,” while “joint logistics” is “the coordinated use, synchronization, and sharing of two or more military departments’ logistic resources to support the joint force.”³ During the Vietnam War the services used the term “unified command” to refer to the cooperation between each other. The National Security Act of 1947 defined “unified command” as a “military command which has broad, continuing missions under a single commander and which is composed of forces from two or more military departments.”⁴ The services did not fully adopt the term “joint” until Operation DESERT STORM, despite the legislative mandate to do so by the Goldwater-Nichols Act of 1986.⁵ Today, the Secretary of Defense manages joint logistics through the seven core capabilities, as mandated by Title 10 United States Code. Effective management of the first three core logistics capabilities: supply, maintenance operations, and deployment and distribution, provides for the sustainment of the force. The first core logistic capability, supply, is defined as “operations that include identifying requirements, selecting supply sources, scheduling deliveries, receiving, verifying and transferring product, inspection and acceptance, and authorizing supplier payments.”⁶ The supply

³ U.S. Department of Defense, *Joint Publication 1-02*. (Washington, DC: Government Printing Office, 2010), 171, 178.

⁴ Chairman of the Joint Chiefs of Staff, *Joint Staff Officers Guide AFSC Pub* (Washington, DC: Government Printing Office, 1997), Chapter 2.

⁵ James R. Locher III, *Victory on the Potomac* (Texas A&M University Press, College Station, 2002), 437-450.

⁶ U.S. Department of Defense, *Joint Publication 4-03*. (Washington, DC: Government Printing Office, 2010), I-10.

core capability consists of three functional capabilities: managing supplies and equipment, managing inventory, and managing supplier networks. Maintenance operations, the second core logistic capability, is defined as “operations that encompass key functions executed by the services to deliver systems readiness and enable the Joint Force Commander’s freedom of action.”⁷ The maintenance operations core capability consists of six functions- inspect, test, service, repair, rebuild, and calibrate. These functions are critical in order to provide effective maintenance to the joint force. Deployment and distribution, the third core logistic capability, is defined as “operations including planning, coordinating, synchronizing, moving forces, and sustainment, and operating the Joint Deployment and Distribution Enterprise in support of military operations.”⁸ Deployment and distribution consists of four functions: move the force, sustain the force, operate the Joint Deployment and Distribution Enterprise, and supply chain relationships.

Increased centralized management contributes to the effectiveness of the core capabilities, and implementing performance measures provides the necessary tools to gauge the level of centralization during a conflict. Current joint logistics doctrine outlines three imperatives necessary to achieve agile sustainment of the joint force. These imperatives include unity of effort, joint logistics environment-wide visibility, and rapid and precise response, and provide the means to evaluate logistics management and determine its effectiveness. Coordinating logistics at the operational level, which is the level that links the tactical employment of forces to the strategic objectives, remains a complex task involving numerous personnel, units, and agencies with conflicting goals and competing priorities.⁹ The overall goal of each service is to provide uninterrupted logistics support to their combat forces, but the details of logistical planning make

⁷ U.S. Department of Defense, *Joint Publication 4-0*, I-10.

⁸ Ibid.

⁹ U.S. Department of Defense, *Joint Publication 3-0: Joint Operation* (Washington, DC: Government Printing Office, 2011), xi.

integration among them difficult. Synchronizing multiple logistical actions in time, space, and purpose requires strict adherence to the principle of unity of effort. Unity of effort is defined as “coordination and cooperation among all forces toward commonly recognized objective, even if the forces are not necessarily part of the same command structure.”¹⁰

The ability to maintain a logistics common operating picture not only provides the commander the ability to sustain operations on the tactical level, but also allows managers at the operational level to prioritize assets across services in order to maximize available resources.¹¹ Current joint doctrine terms this capability as joint logistics environment -wide visibility, which is defined as “having assured access to logistic processes, resources and requirements in order to gain the knowledge necessary to make effective decisions.”¹² As conditions fluctuate on the battlefield, so do logistical requirements. At the operational level, logisticians must possess the ability to distribute required resources quickly to the necessary force, referred to in the current joint doctrine as “rapid and precise response.”¹³ Rapid and precise response is defined as “the ability of the core logistics capability areas to meet the constantly changing needs to the joint force.”¹⁴

Determining the required level of centralization at the operational level is critical because strategic and tactical capabilities intersect at this level. As the planners, executors, and controllers of core logistics capabilities, logisticians must understand tactical, operational, and strategic

¹⁰ U.S. Department of Defense, *Joint Publication 4-03*. (Washington, DC: Government Printing Office, 2010), ix.

¹¹ A common operating picture is a display of relevant information shared by more than one level of command that facilitates collaborative planning and assists all echelons to achieve situational awareness. *Field Manual 3-0: Operations c1* (Washington, DC: Government Printing Office, 2008), 6-12.

¹² U.S. Department of Defense, *Joint Publication 4-03*. 09 December 2010 (Washington, DC: Government Printing Office, 2010), ix.

¹³ U.S. Department of Defense, *Joint Publication 4-03*, x.

¹⁴ U.S. Department of Defense, *Joint Publication 4-03*, x.

operations in order to synchronize efforts to meet joint force requirements effectively.¹⁵ The operational level of war is the “level of war at which campaigns and major operations are planned, conducted, and sustained to achieve strategic objectives within theaters or other operational areas.”¹⁶ At this level, identifying a central authority to manage logistics across all services within the theater enables the prioritization of resources, reduces the tendency to stockpile supplies, and maximizes the allocation of critical assets. This central authority would ensure logistics forces met the requirements of the supported commander by overseeing the effective and efficient delivery of joint logistics.¹⁷

Assuming an inevitable decrease in American military personnel and an increase in the reliance on joint operations, it seems imperative to implement an efficient management method in support of combat operations. By studying how the military managed logistics in previous conflicts, today’s logisticians can weigh the benefits and shortcomings of previous management techniques, and recommend the most effective level of centralization based on current military organization, technological advances, and resource constraints. Proponents for increasing the level of centralization of logistics within the Department of Defense argue doing so will increase efficiencies and reduce overall costs.¹⁸ Streamlining resources centralizes logistical management and ensures all services mutually benefit. Joint Publication (JP) 4-0 (2008), the current joint doctrine, refers to this centralization as “the coordinated use, synchronization, and sharing of two

¹⁵ U.S. Department of Defense, *Joint Publication 4-0: Joint Logistics* (Washington, DC: Government Printing Office, 2008), viii.

¹⁶ U.S. Department of Defense, *Joint Publication 3-0: Joint Operation* (Washington, DC: Government Printing Office, 2011), GL-14.

¹⁷ U.S. Department of Defense, *Joint Publication 4-0: Joint Logistics* (Washington, DC: Government Printing Office, 2008), x.

¹⁸ Lieutenant Colonel Keith M. Rembert M., *Creation of a Unified Logistics Command*. Strategy Research Project (Carlisle Barracks: United States Army War College, 1996), 16-24; James K. Matthews and Margaret J. Nigra, *Lieutenant General Daniel G. Brown United States Army Deputy Commander in Chief, United States Transportation Command: An Oral History* (Scott Air Force Base: United States Transportation Command, 2006), 38-44.

or more Military Departments' [logistical] resources to support the joint force.”¹⁹ Opponents of increased centralization prefer to retain control over their own resources because it requires less coordination and provides the services more flexibility to prioritize the resources from within the organization. Large organizations typically tend to reject sharing resources specifically because of the increased level of coordination and synchronization involved in procuring proportioned materials. By retaining control of separate resources, services maintain the ability to prioritize and manage these resources according to their individual operational needs. This method is typically less efficient because it generates excess stores and redundant efforts. Given these contrasting points of view, what are the trends in the management of joint operational logistics since the Second World War?

During the Second World War, centralized logistics management experienced disjointedness from the beginning. In 1942, the War Department created the Services of Supply (renamed Army Service Forces in 1943) under advisement from Major General Brehon B. Somervell, the War Department's head logistics officer, to manage logistics in both the European and Pacific theaters.²⁰ Lack of clarity in the command relationship between the Services of Supply and the European Theater of Operations, United States Army caused friction, which was not resolved until General Dwight D. Eisenhower assumed theater command. Although the Services of Supply ultimately retained responsibility for logistics, they did not centrally manage the core logistics functions. The military stockpiled supplies in theater, but was unable to maintain accountability because logistics troops were overwhelmed. Reliance on the merchant shipping industry, which the military did not have any authority over, challenged the deployment and distribution function, however, use of motorized transport and rail did enhance ground

¹⁹ U.S. Department of Defense, *Joint Publication 4-03*. (Washington, DC: Government Printing Office, 2010), p.I-2.

²⁰ John Kennedy Ohl, *Supplying the Troops, General Somervell and American Logistics in WWII* (DeKalb: Northern Illinois University Press, 1994), 60-61.

distribution capability. Combat units relied on the logistics units' ability to deliver adequate repair parts to execute maintenance operations, but the delivery system was not responsive due to the implementation of pre-planned shipments to re-supply forward elements.²¹ Using this method of resupply severely limited flexibility to adjust unit requisitions as logisticians based re-supply on anticipated needs rather than actual requirements.²² In the Second World War, the Services of Supply did not organize itself in a manner that provided an adequate level of central control to provide proper management of logistics in theater.

The Department of Defense has the option to implement different logistics management techniques, which offer various levels of central control. One method would require each service to manage its own requirements hindering possible re-prioritization of resources within a theater. Another technique is to centralize the theater-level management of common user items, such as food, fuel, and transportation assets, across the services leaving management of service-specific requirements to each individual service. Another option would be to create a unified logistics command responsible for all requirements across the services within a theater. Historically, operational level commanders have implemented varying degrees of control in the management of common user logistics since 1960 for the joint sustainment of ground forces. Since the Second World War, the American military has increasingly centralized the management of logistics in order to increase efficiency and reduce overall costs. This centralization is best demonstrated through the examination of the core logistics functions of supply, maintenance operations, and deployment and distribution.

²¹ Richard M. Leighton and Robert W. Coakley, *Global Logistics and Strategy, 1943-1945*, (Washington, DC: Government Printing Office, 1955), 320-321.

²² Alan Gropman, *The Big "L"- American Logistics in World War II* (Washington, DC: National Defense University, 1997), 433-347, 350-351, 374; James A. Huston, *The Sinews of War: Army Logistics 1775-1953*, (Washington, DC: Government Printing Office, 1966), 496-514.

Vietnam War

The Vietnam Conflict (1962-1975) is a good place to begin the study of changes in the operational logistics environment. One prominent leader, the Commanding General of the Fleet Marine Force, U.S. Pacific Fleet, Lieutenant General Victor H. (“Brute”) Krulak, even went as far as stating that the Vietnam War was a “logistics war.”²³ Logistical inefficiencies and financial waste in previous wars, which the Second Hoover Commission identified in its 1955 report recommending changes in the federal government, prompted Congress to pressure the Department of Defense to restructure logistics operations into a unified command.²⁴ Since the services had not yet adopted the term “joint” to describe multi-service operations, a unified command was the closest organizational structure to modern day joint operations. The Secretary of Defense, Robert S. McNamara, reluctant to create a unified logistics command, formed a modified version named the Defense Supply Agency in 1961. This organization consolidated eight existing managerial agencies into four and increased efficiency levels across all services by reducing redundancy and unifying operations. Each service also consolidated logistics functions from within, resulting in the creation of the Army Materiel Command, the Naval Materiel Command, and the Air Force Materiel Command.²⁵ Even with the creation of these new organizations, the problems managing common user logistics across the services remained because the new Defense Supply Agency only handled approximately 50 per cent of supplies requested in Vietnam. Additionally, General William Westmoreland, the commander of U.S. forces in Vietnam, did not establish an operational level logistics command, 1st Logistics

²³ Edwin Bickford Hooper, *Mobility, Support, Endurance: A Story of Naval Operational Logistics in the Vietnam War 1965-1968* (Washington, DC: Government Printing Office, 1972), 4.

²⁴ In 1953, Congress created the Second Hoover Commission to study the Federal Government of the United States and recommend changes to improve efficiency. The final report was submitted to Congress in June 1955.

²⁵ Charles R. Shrader, *United States Army Logistics 1775-1992*. Vol. 3. 3 vols. (Washington, DC: Government Printing Office, 1997), 657.

Command, until over 29,000 combat troops had already arrived in theater.²⁶ He was unable to create this command earlier because the Joint Chiefs of Staff declined his request for more support troops due to an armed-forces wide shortage of logistics units. It was not until 1 April 1965 that President Lyndon B. Johnson authorized an additional 18,000-20,000 support troops to deploy to Vietnam²⁷ The operational logistical challenges associated with sustaining combat operations in a remote, austere environment exponentially increased the reliance on unity of effort between the services, joint logistics environment-wide visibility, and rapid and precise response. The Joint Chiefs' failure to manage the demands centrally of the expanding force early in the conflict led to logistical difficulties throughout the duration of the war.

Changes in the method in which the United States military managed supply operations between the conclusion of World War II and the onset of Vietnam created confusion and shortfalls within the system. During World War II, the Army created overseas supply divisions based at every major port to manage and prioritize all supplies entering a theater. These divisions, operating under the War Department, centralized supply operations for an entire theater, and allowed the theater commander to maintain joint logistics environment-wide visibility. After 1962, however, the War Department disbanded overseas supply divisions resulting in a lack of central management for supplies entering the Vietnam Theater. The absence of a headquarters led to numerous supply difficulties such as overcrowded ports, requisition errors, delivery delays, and supply accounting errors.²⁸ Furthermore, during the initial stages of the Vietnam War from 1962-1965, inadequate numbers of logistics troops, unsuitable logistics bases, and no tracking mechanisms, such as computerized databases or lists of acceptable substitute items by service,

²⁶ Shrader, *United States Army Logistics 1775-1992*. Vol. 3. 3 vols., 807; Graham A. Cosmas, *MACV The Joint Command in the Years of Escalation 1962-1967* (Washington, DC: Government Printing Office, 2006), 245.

²⁷ Cosmas, *MACV The Joint Command in the Years of Escalation 1962-1967*, 170, 208.

²⁸ Carter B. Magruder, *Recurring Logistic Problems As I Have Observed Them* (Washington, DC: Government Printing Office, 1991), 58-59.

contributed to the stockpile of supplies onshore in Saigon.²⁹ Military Assistance Command Vietnam's inability to monitor and control supplies in theater stagnated until the Navy, realizing the importance of its central location, improved the Cam Ranh Bay port with a major supply depot in 1966, and the Army called up logistics troops from the reserves to augment logistics units in theater. The Navy, Air Force, and Army all operated major supply depots out of Cam Ranh Bay and Da Nang, another port city located along the northern coast of South Vietnam.³⁰

As early as 1962, while the United States military was still in an advisory role, the Military Assistance Advisory Group attempted to organize the supply system in Vietnam by designating the Navy as the administrative agency responsible for providing logistics support to the Military Assistance Command Vietnam. Although Admiral John H. Sides, the Commander in Chief, Pacific Fleet, did not want to provide the support for what he considered a ground forces mission, Admiral George W. Anderson, Jr., Chief of Naval Operations, and Admiral Harry D. Felt ordered Admiral Sides to execute the mission. Not only was the Navy required to provide support to the Military Assistance Command Vietnam due to a 1950s Department of Defense directive, but also its leadership was vying to maintain control of operations in Vietnam.³¹ Consequently, the Fleet provided all common supply support to forces in Vietnam; however, the Military Assistance Command Vietnam later partitioned responsibility into four corps tactical zones. By 1966, the Navy provided general supplies to all services in the northernmost corps tactical zone, while the Army assumed responsibility for the remaining three zones. This fragmented supply system resulted in low demand satisfaction between the services because the Army did not stock many items required by both the Navy and Air Force, nor did these services stock items

²⁹ Carter B. Magruder, *Recurring Logistic Problems As I Have Observed Them*, 29.

³⁰ *Ibid.*, 245; Lieutenant Colonel Robert L. Burke, "Corps Logistic Planning in Vietnam," *Military Review* vol. XLIX, no. 8 (August 1969): 3.

³¹ Cosmas, *MACV The Joint Command in the Years of Escalation 1962-1967*, 52-53.

commonly consumed by Army units.³² When the Joint Chiefs of Staff recommended that the Army become solely responsible for all supply support in theater, the Department of Defense disapproved the request based on concerns voiced from General Westmoreland and Admiral Ulysses S. Grant Sharp, the Commander in Chief Pacific. Commanders, as well as the other services, agreed that the Army supply system's efficiencies and responsiveness to provide logistics throughout the theater were insufficient for the service requirements.³³ The Navy even went as far as sending a naval officer to assist with determining a solution to Army supply problems in an attempt to reach mutually beneficial solutions for all services, but still considered the Army's supply of common items as inefficient. The Air Force, which mainly operated from the large airfields in Southwest Asia, continued to support itself logistically.³⁴

Supply accountability in Vietnam remained a serious problem, which interfered with the services' ability to maintain joint logistics environment-wide visibility. At the onset of major troop deployments, the Army was in the midst of transferring most of its requisitions from the manual UNIVAC 1005 card processing system to an automated system on the IBM 7010/1460 computers; however, insufficiently trained experts and inadequate computer systems contributed to poor implementation of the new system. The interoperability between the manual system utilized in Vietnam and the automated system in the United States created difficulties in the supply system. Oftentimes, requisitions were lost because supply clerks did not input the request into the automated system because it was so time consuming. Although the military began using

³² Cosmas, *MACV The Joint Command in the Years of Escalation 1962-1967*, 246.
Joseph M. Heiser, *Vietnam Studies: Logistic Support* (Washington, DC: Government Printing Office, 1974), 82-84.

³³ Joseph M. Heiser, *Vietnam Studies: Logistic Support* (Washington, DC: Government Printing Office, 1974), 82-83.

³⁴ Hooper, *Mobility, Support, Endurance: A Story of Naval Operational Logistics in the Vietnam War 1965-1968*, 142.

the automated system in 1968, it was still unable to handle the theater supply demands.³⁵ These problems in the requisitioning system hindered the Army's ability to manage all supplies and equipment in Southeast Asia.

The absence of a responsible logistics manager in Vietnam resulted in an inability to achieve unity of effort between the services when requisitioning supplies. Commanders did not know their limitations on the type, cost, or quantity of supplies they could order because the Military Assistance Command Vietnam did not designate a logistics authority to manage these requisitions. Additionally, no headquarters identified priorities for supplies shipped to Vietnam. For example, in 1965-1966, construction materials, largely an uncontrolled resource, created a major strain on the supply system, mainly because no one established a standardized quality of living, and individual units proceeded to order the highest quality of life items available. Construction material accounted for 40 per cent of the incoming tonnage, thus requiring a centralized solution to manage the efforts of construction plans, supplies, and materials if implemented.³⁶ A central management authority would have coordinated the resource requirements across all services to achieve their goals of providing adequate shelter for all soldiers. This could have also allowed the ability to re-prioritize construction material and ensure the requirement to manage, inventory, and distribute unnecessary materials did not overburden the already inadequate number of logistics soldiers. It was not until 1966 when the Robert McNamara, the Secretary of Defense, directed General Westmoreland to create the Military Assistance Command Construction Directorate that the construction effort in Vietnam became centralized.³⁷

³⁵ Heiser, *Vietnam Studies: Logistic Support*, 37.

³⁶ Heiser, *Vietnam Studies: Logistic Support*, 17.

³⁷ Cosmas, *MACV The Joint Command in the Years of Escalation 1962-1967*, 281-282.

In order to properly manage inventory levels and leverage the capabilities of suppliers to fill shortages, a central management authority would need accurate visibility of all supplies in Vietnam. By 1967, accountability problems within the supply system in Vietnam generated an overwhelming concern regarding the large number of high priority requisitions. Many national inventory control points, the United States Army Pacific Command Headquarters, and other commands questioned the validity and need for such requests. In an attempt to validate the high number of priority requests, which were expensive and resource intensive to process, Army Materiel Command spearheaded two initiatives tailored at streamlining the supply pipeline to Vietnam. The first, Project Challenge, reduced transportation and handling costs and increased the level of control in the ordering process by requiring unit commanders to verify the priority of each requisition. Project Counter sent highly trained supply subject matter experts from Army Materiel Command to Vietnam to instruct poorly trained supply soldiers, assist in inventorying on hand stocks, and review effectiveness of existing processes. Over the course of the next several years, the military implemented additional programs to increase supply efficiencies.³⁸

Although General Westmoreland attempted to centralize maintenance operations in 1966 by asking the Joint Chiefs for more logistics troops in Vietnam, their decision to deny his request halted those efforts.³⁹ Previously, the services, preferring to establish self-reliant maintenance operations, overlooked common maintenance support between services during the build-up stages of Vietnam. Different types of equipment between the services and their geographical distances inhibited the effort to streamline maintenance operations. Limited commonality in repair parts required units to seek support from inside their own service, even when a higher authority tasked another service with providing that support. In the case of the 3d Squadron, 5th Cavalry, 9th Infantry Division, attached to the 1st Marine Division at Da Nang, it received maintenance

³⁸ Cosmas, *MACV The Joint Command in the Years of Escalation 1962-1967*, 60-73.

³⁹ *Ibid.*, 170.

support from a separate Army maintenance unit in the vicinity to accommodate their specific logistical needs while operating with the Marines.⁴⁰ Eventually, the services established some common maintenance support between themselves out of necessity through cooperative exchange arrangements. The support commands within each service typically established these agreements; however, no command relationship bound a services' adherence to the arrangement. Under these agreements, the Army provided UH-1 helicopter maintenance to the Navy and Air Force and radar equipment maintenance to the Marines. The Air Force provided maintenance to Army aircraft, test sets, and other special equipment. The Navy provided maintenance to tires, certain motors, and office machines to the Army.⁴¹

Due to the decentralized nature of maintenance management in theater, services generally relied on mechanics at the unit level to maintain equipment readiness. Maintenance units executed minor equipment repairs within their area of operations even though guerilla attacks and the absence of suitable areas to conduct heavy maintenance operations inhibited some types of repairs. Equipment requiring highly technical or extensive repair required shipment back to Japan or the United States, inevitably prolonging the repair cycle and making it more feasible to introduce new or refurbished equipment into the system immediately.⁴² Fortunately, equipment readiness did not detrimentally affect combat operations due to the decentralized manner in which the Military Assistance Command Vietnam managed maintenance.

Until the later part of 1965, no central agency existed to coordinate deployment and distribution operations in theater. Air Traffic Coordinating Offices managed air transportation locally, the Military Sea Transport Service managed water transportation requirements, and local ground support units managed all highway transport within their area of operations. These

⁴⁰ Heiser, *Vietnam Studies: Logistic Support*, 184.

⁴¹ *Ibid.*, 184-185.

⁴² Magruder, *Recurring Logistic Problems As I Have Observed Them*, 85.

decentralized operations, without a higher authority with a holistic view, resulted in wasted transportation resources, failure to understand the in-country transportation capability, and fragmented support to users.⁴³ The absence of procedures to coordinate inter- and intra-theater shipping, in addition to supplies arriving without the knowledge of any Southeast Asia movement control agency, further decreased distribution response time. Military Assistance Command Vietnam did not establish a responsible agency at theater level to manage the distribution processes for each service so the logistics pipeline from the source of supply all the way down to the requesting unit was fragmented.⁴⁴ Upon realization of these inefficiencies, General Westmoreland ordered the creation of a jointly staffed Traffic Management Agency in 1966, under his operational control and staff supervision of the J-4.⁴⁵ The primary mission of this agency was to optimize the use of common-user transportation capabilities across the services.⁴⁶ The construction of several new ports in Vietnam also benefitted moving towards rectifying the throughput problem in theater.⁴⁷ Although the Military Assistance Command Vietnam made a greater attempt to centralize the management of deployment and distribution operations in Vietnam than it did with either supply or maintenance operations, the creation of the Traffic Management Agency still did not alleviate all of the difficulties the services encountered in executing deployment and distribution operations.

Another important aspect of deployment and distribution operations is managing the force flow into theater to ensure a proper mix of logistics troops to support combat troops and establishing adequate support bases. As the situation in Vietnam quickly transitioned from one of

⁴³ Heiser, *Vietnam Studies: Logistic Support*, 158-161.

⁴⁴ Jack C. Fuson, *Transportation and Logistics: One Man's Story* (Washington, DC: Government Printing Office, 1997), 110-132.

⁴⁵ The J4 is the logistics directorate of a joint staff. U.S. Department of Defense, *Joint Publication 1-02 Department of Defense Dictionary of Military and Associated Terms*, A-78.

⁴⁶ Heiser, *Vietnam Studies: Logistic Support*, 158-161.

⁴⁷ Fuson, *Transportation and Logistics: One Man's Story*, 120.

an advisory role, to that of a combat mission, the services deployed combat troops into Vietnam faster than support elements could build logistical bases to support them. The existing infrastructure was either inadequate to support large numbers of U.S. forces or already under enemy control. The 1st Logistics Command, programmed to eventually assume command and control for all logistics for ground troops in theater, activated on April 1st, 1965, well after the U.S. already had 29,100 troops in theater.⁴⁸ Troop numbers would increase more than six intervals by the end of the year for a force already insufficiently supplied. Moreover, the Joint Chiefs of Staff assumed risk in the requirement to staff and organize logistical units in theater to provide increased troop levels the amount of support they required.⁴⁹

Even though Secretary of Defense McNamara eventually established a central authority to manage deployment and distribution, the delinquency in its creation generated problems that would reverberate throughout the war. These issues affected both deployment and distribution and supply operations since the two were dependent upon one another. After World War II, the military began using shipping containers and roll-on, roll-off ships to speed up cargo handling and reduce off-load time.⁵⁰ At the inception of the Vietnam War, insufficient lift assets, such as forklifts and cranes, and inadequate space at ports in Vietnam caused significant delays in the initial steps of the distribution process. The military held ships in port, both civilian and military, using them as temporary storage facilities, and unloading cargo only to fill requisitions from units in combat. These actions squandered precious military cargo transports and angered commercial vessel operators.⁵¹ Additionally, the requirement to offload cargo ships rapidly affected the ability to achieve asset visibility on these items. Transportation units pushed un-inventoried supplies

⁴⁸ Lieutenant Colonel Robert L. Burke, "Corps Logistic Planning in Vietnam," 3.

⁴⁹ Cosmas, *MACV The Joint Command in the Years of Escalation 1962-1967*, 170. Heiser, *Vietnam Studies: Logistic Support*, 8-17.

⁵⁰ Magruder, *Recurring Logistic Problems As I Have Observed Them*, 105-106.

⁵¹ Fuson, *Transportation and Logistics: One Man's Story*, 113-114.

forward to units in an effort to clear the ports and make room for new shipments, while at the same time; units gaining these supplies never fully achieved accurate accountability. The accumulated effect created by inaccurate supply accountability and equipment resulted in deteriorated joint logistics environment-wide visibility.⁵²

Combat units in Vietnam had so little confidence in the supply distribution system that unit-level logisticians began to stockpile supplies at firebases around the country. Poor weather, harsh terrain, and compartmentalized supply lines hindered rapid resupply to combat units. Units became heavily reliant on aerial resupply when untenable roads or seasonal floods blocked roads from logistics transport of supplies; poor weather conditions often-halted aerial re-supply. The Navy and Army had each establish separate, small port facilities with depots along the coast from which to distribute supplies to troops forward. These depots operated independently of one another and the ability to re-distribute supplies did not exist.⁵³ Ineffectively managed deployment and distribution operations plagued the rapid and precise delivery of supplies and equipment throughout the Vietnam War.

Although it took several years to even identify a logistics manager in Southeast Asia, by the war's conclusion the Military Assistance Command Vietnam finally designated the 1st Logistics Command as the headquarters charged with the central management of logistics in theater. The 1st Logistics Command, however, proved inefficient in effectively managing supply, maintenance, and deployment and distribution operations. They never gained joint logistics environment-wide visibility of supplies, achieved unity of effort between the services, or distributed supplies in a rapid and precise manner. The Department of Defense accounted for

⁵² Fuson, *Transportation and Logistics: One Man's Story*, 118-119.

⁵³ George L. MacGarrigle, *Taking the Offensive: October 1966 to October 1967* (Washington, DC: Government Printing Office, 1998), 12.

these lessons learned by increasing the level of centralization at the onset of the next conflict, Operation DESERT STORM.

Operation DESERT STORM

The Department of Defense continued to centralize its logistics management during Operation DESERT SHIELD (02 August 1990-16 January 1991) and DESERT STORM (16 January 1991– 01 March 1991). One lesson the military learned from the Vietnam War was the need to implement a headquarters to assume logistics responsibility, to include seaport and airport control, during a conflict. The deputy commander of logistics, Major General Pagonis, U.S. Central Command’s deputy commander for logistics, recognized the need for a single-point of logistical contact and bluntly stated to General Norman Schwarzkopf “we cannot have another mess like Vietnam.”⁵⁴As a result, Central Command established the 22d Support Command to perform this critical mission.⁵⁵ Although considered an overall success, the creation of a support command in theater presented logistical difficulties that the services did not easily overcome in order to provide seamless support to all services in the Persian Gulf. The logistical situation during the initial stages of Operation DESERT STORM lagged far behind where it should have been to support the influx of combat troops. Army Central Command planners had intended only to establish a small logistics footprint in southwest Asia, therefore allocated the priority of deploying forces to combat troops with only their organic support elements. Authorization levels did not provide the staffing or equipment to organic support units to provide the logistics infrastructure, support, or management required to support thousands of soldiers, airmen, and marines flowing into theater. Finally, the U.S. Army Central Command Commander, Lieutenant.

⁵⁴ Schechter et al, *Delivering the Goods: The Art of Managing Your Supply Chain* (Hoboken: John Wiley and Sons, Inc., 2002), 78.

⁵⁵ Shrader, United States Army Logistics 1775-1992. Vol. 3. 3 vols., 761-762; Damon Schechter, and Gordon Sander, *Delivering the Goods: The Art of Managing Your Supply Chain*, 77.

General John J. Yeosock, appointed Major General Pagonis to manage the theater logistics. By the time Major General Pagonis arrived in theater, the logistical situation had already spiraled out of control with troops lacking proper sanitation facilities, food, shelter, supplies, and transportation. Major General Pagonis and his initial staff of four officers began to formulate a logistics plan for the theater under the guise of a provisional logistics command. Fortunately, he was able to leverage the supplies and equipment from four Army pre-positioned ships from Diego Garcia carrying food, construction equipment, ammunition, and medical supplies to set-up an initial infrastructure, however, a game of catch-up was already underway. The U.S. Central Command had charged the Provisional Support Command with also providing support to the Navy, Air Force, and Marine Corps ground forces once they arrived in theater. Additionally, the Army now served as the executive agency for food, water, bulk fuel, ground munitions, veterinary services, and graves registration.⁵⁶ Easing the logistics burden on the Provisional Support Command, naval ships in theater were self-sustaining and the Air Force relied primarily on pre-positioned stocks in Oman, Bahrain, and three ships in the initial stages of the conflict.⁵⁷

Drawing on lessons learned from the Vietnam War, high-ranking logisticians, such as Pagonis, recognized that centralized logistics management was the key to successful support of combat operations.⁵⁸ During the build-up to Operation DESERT STORM, the 22D Support Command, still under the title of the Provisional Support Command, established two large logistical bases where logistics units stockpiled large amounts of supplies. By December 1990,

⁵⁶ Center of Military History, *War in the Persian Gulf: Operations Desert Shield and DESERT STORM August 1990-March 1991*. (Washington, DC: Government Printing Office, 2010), 8-11; 22D Support Command, *22D Support Command After Action Report Executive Summary Desert Shield/DESERT STORM*. After Action Report, Command Reports 1-4.

⁵⁷ Dr. Eliot A. Cohen, *Gulf War Air Power Survey Volume III: Logistics and Support*. Review of air warfare in the Persian Gulf (Washington, DC: Government Printing Office, 1994), 2-3.

⁵⁸ Schechter et al, *Delivering the Goods: The Art of Managing Your Supply Chain* (Hoboken: John Wiley and Sons, Inc., 2002), 13.

military leaders realized the need for a formal logistics command and control element to manage these huge quantities of supplies that were building in theater and designated the 22d Support Command to perform this mission.⁵⁹ By designating 22d Support Command as the theater army area command structure, logisticians at all levels during the Gulf War were able to maintain a single theater integrated logistics focus. Furthermore, as a more centralized logistics command structure than the one in Vietnam, the 22d Support Command oversaw the integration of logistics into the overall ground plan at the operational level.⁶⁰

Supply operations, maintenance operations, and deployment and distribution operations were exclusively dependent on one another. Failure in one operation caused difficulties in the other two areas. Therefore, to anticipate future supply, maintenance, and transportation requirements, the 22d Support Command formed a logistics command cell, or “log cell” as the Support Command referred to it in Operation DESERT STORM. These planners rehearsed possible scenarios and forecasted the logistical requirements for each outcome. To aid these planning efforts, the Support Command commander sent representatives across the battlefield to monitor combat preparations and obtain information on potential future combat actions. The representative would then disseminate the acquired reports back to the log cell for action.⁶¹ While the implementation of the logistics cell did result in the reduction of many logistical challenges prior to combat operations, it was unable to resolve some of the difficulties once combat operations commenced. In an effort to provide continuous support and facilitate rapid response once combat operations did begin, the 22d Support Command implemented the use of mobile logistics bases to move with and support combat units. These logistics bases consisted of the

⁵⁹ Frank N. Shubert, and Theresa L. Kraus, *The Whirlwind War* (Washington, DC: Government Printing Office, 1995), 139-141.

⁶⁰ William G. Pagonis, and Michael D. Krause, "Operational Logistics and the Gulf War." *The Institute of Land Warfare* (The Association of the United States Army, 1992: 1-17), 14; Swain, *"Lucky War" Third Army in Desert Storm*, 29.

⁶¹ Schechter et al, *Delivering the Goods: The Art of Managing Your Supply Chain*, 79-80.

smallest amount of essential supplies necessary to provide responsive support.⁶² Mobile logistics bases facilitated the momentum of the attack during ground combat operations. In total, the 22d Support Command established ten mobile logistics bases to sustain the XVIII Airborne Corps, VII Corps, and the I Marine Expeditionary Force. The 22d Support Command's ability to tailor the supplies allocated to each logistics base and position each base from unit mission data contributed to the central management they exercised over theater logistics.⁶³

In order to maintain a logistics common operating picture in a high operational tempo environment, forward and supporting units must establish effective communications between one another. Neither active duty nor reserve support units deploying into theater possessed adequate communications equipment to maintain contact with forward units to track supply statuses and requisitions. For instance, the 7th Transportation Group possessed only three radios to manage the operations for approximately 9,100 sustainment personnel. The 22D Support Command had so little communications equipment that they were eventually forced to rely on the civilian networks in Saudi Arabia and contract cellular telephones to conduct coordination.⁶⁴ A changeover in the Army's automated requisitioning system further complicated the common operating picture. About half of the units in theater had already upgraded to a more modern automated supply system, the Army had alerted others for deployment during the changeover, and some had not even begun to convert at all. In order to alleviate the problem, the 22d Support Command accepted requisitions via both the new and old automated system as well as manually. Although these workarounds plugged the holes in the requisitioning process, it still took longer to process

⁶² Schechter et al, *Delivering the Goods: The Art of Managing Your Supply Chain*, 79; 22D Support Command, 22D Support Command After Action Report Executive Summary Desert Shield/DESERT STORM. After Action Report, Command Reports 8.

⁶³ Honorable I. Lewis Libby, *The Conduct of the Persian Gulf War* (Report to Congress, Washington, DC: Under Secretary of Defense for Policy, 1992), 296.

⁶⁴ Schubert et al, *The Whirlwind War*, 141-142; Lieutenant Colonel Frederic J. Brown, Retired, "Reserve Forces: Challenges of the 1990s." *Military Review* vol. LXXI, no.8 (August 1991), 14.

requests and further strained an already undermanned Support Command staff. Units circumvented the system in an attempt to receive supplies more quickly and formed the habit of calling back directly to their home station in an effort to have them acquire the necessary supplies to ship forward. This created another unnecessary burden on the supply pipeline as units often “double-ordered,” or requisitioned the supplies through the in-theater system and through a call back to home station, in an effort to leverage whichever method produced the supplies more quickly.⁶⁵ These techniques contributed to less than optimal joint logistics environment-wide visibility and flooded the supply system with excess supplies straining the logistics work force and transportation assets.

Supply visibility problems complicated the 22d Support Command’s ability distribute some resources to forward combat units. Logistics units receiving cargo during Operation DESERT STORM experienced similar visibility problems as in Vietnam. Half of the 40,000 containers the United States shipped into theater during the conflict carried no final destination details or failed to identify their contents properly.⁶⁶ Logistics soldiers had to open and inventory nearly every container that arrived in theater to determine its contents because shippers failed to include a detailed inventory list on the labeling. Because of the limited number of soldiers executing port operations, most containers simply sat at the port until soldiers had enough time to open the container, inventory the contents, and re-pack it for shipment to the appropriate unit. It was nearly impossible to pinpoint the location of any specific item that manufacturers shipped via sealift.

Although the 22D Support Command assumed responsibility for supply operations once the supplies arrived in theater, the command failed to manage supplies by priority coming into

⁶⁵ Brigadier General Robert H. Scales, Jr., *Certain Victory; The U.S. Army in the Gulf War* (Washington, DC: Brassey's, 1994), 69-76.

⁶⁶ Schechter et al, *Delivering the Goods: The Art of Managing Your Supply Chain*, 183.

theater. A blatant example of an underutilized method to transport supplies into theater efficiently was the Desert Express. The Desert Express service delivered supplies into theater and reduced transport time from two weeks to seventy-two hours.⁶⁷ Inefficient use of this airlift asset and failure to prioritize cargo resulted in flights departing for theater at only half capacity. The United States Transportation Command allocated each service a varying amount of space and weight limit for each flight. Services reserved cargo space on a first-come, first-serve basis- meaning that the first unit to arrive at the airfield with the proper packaging and documentation for their cargo shipped their supplies first, regardless of importance- and no agency managed the cargo to ensure that the most critical items received prioritization on each flight.⁶⁸ Furthermore, the origin and destination locations of the Desert Express excluded useful resupply to the Navy and Marine Corps. They used the Military Airlift Command, the U.S. Air Force's Military Air Transportation Service, because of a higher level of convenience. Greater central management of the Military Airlift Command by the United States Transportation Command could have maximized the use of airlift assets and aided in the shipment of high priority items.⁶⁹ This flaw in the supply requisitioning and distribution concept, the lack of priority management, highlighted a failure in unity of effort to coordinate supplies and a missed opportunity to provide an even greater rapid and precise response.

Deployment and distribution operations proved the most demanding during Operation DESERT STORM. Appropriate Army doctrine existed to mandate effective deployment operations; however, the Army failed to deploy these logistics units in accordance with that

⁶⁷ Dr. Elliot Cohen, *Gulf War Air Power Survey*. Survey (Washington, DC: Johns Hopkins University School of Advanced International Relations, 1993), 37.

⁶⁸ Richard Davis, *Operation DESERT STORM: The Services' Efforts to Provide Logistics Support for Selected Weapons Systems*. Report to Committee on Armed Services (Washington, DC: Government Printing Office, 1991), 28-29.

⁶⁹ Davis, *Operation DESERT STORM: The Services' Efforts to Provide Logistics Support for Selected Weapons System*. Report to Committee on Armed Services, 28-29.

existing doctrine in an effort to keep the logistics footprint as small as possible.⁷⁰ Logisticians in theater continuously struggled to provide adequate support to maneuver units. Intratheater airlift proved critical to distribution of supplies and personnel throughout the theater. The Air Force established Camel Star, a joint intratheater airlift operation, to transport personnel and supplies between logistics bases. The Army contributed with five C-23B Sherpa transport planes to move supplies. The Central Command J4, Major General Dane Starling, was responsible for prioritizing the airlift missions. The Navy and Marine Corps chose to operate intratheater airlift missions to support themselves.⁷¹ Designation of the 22d Support Command as the central logistics management authority in theater prior to the arrival of combat troops would have given the support command the ability to properly coordinate the balanced arrival of logistics units in theater, develop the theater infrastructure, and procure adequate transportation assets to position units in collaboration with the Central Command J4.

Distribution of supplies and equipment via ground throughout Operation DESERT STORM was an Army responsibility. One of the biggest challenges in distributing supplies and equipment proved to be the management of ground transportation assets. Army transportation units were responsible for repositioning both Army and Marine equipment from the port to forward bases. Combat units entered theater at rapid and irregular intervals and host nation transportation augmented Army transportation units to execute the mission.⁷² Transportation units could only move about one-fourth of the Army's tanks at any given time due to vehicle shortages. The Army also had 1,000 additional cargo trucks pushing supplies forward to Army and Marine units in combat. These organic haul capabilities did not even come close to fulfilling the demands

⁷⁰ Scales, *Certain Victory; The U.S. Army in the Gulf War*, 75-76.

⁷¹ Dr. Eliot A. Cohen, *Gulf War Air Power Survey Volume III: Logistics and Support*. Review of air warfare in the Persian Gulf (Washington, DC: Government Printing Office, 1994), 144-158.

⁷² Lewis, *The Conduct of the Persian Gulf War*, 296-297.

placed on distribution units. To fill the gaps, the military contracted host nation trucks with civilian drivers in addition to receiving thousands of transportation assets from allies. The Air Force even created its own internal line haul capability called the Blueball Express because the Army capacity could not meet their requirements.⁷³ During the 100-hour war, combat vehicles out-ran their supply lines, which the Army compensated for by using rotary-wing re-supply and C-130 air drops; however, if the ground war had lasted much longer, combat forces would have been required to execute a tactical pause in order to receive resupply.⁷⁴

Equipment readiness suffered initially across all services because visibility and requisitioning problems with repair parts. In response, the Navy and Air Force chose to overhaul their requisitioning systems, while the Army simply modified their existing system.⁷⁵ The 22D Support Command attributed the difficulty units experienced in receiving requested repair parts to the absence of visibility and tracking the parts. Repair parts arrived in theater in marked containers requiring logistics units to inventory, stock, and fill combat unit requisitions. The 321st Material Management Center deployed in October of 1990 to manage repair parts in theater, but by then, units had already begun to obtain repair parts directly from the continental U.S. because they were unable to acquire parts from theater stocks. The 321st Material Management Center never gained visibility of repair parts requisitions in and theater, which hindered them from managing unit requirements. Furthermore, since actual combat operations lasted only 100 hours,

⁷³ Dr. Eliot A. Cohen, *Gulf War Air Power Survey Volume III: Logistics and Support*. Review of air warfare in the Persian Gulf (Washington, DC: Government Printing Office, 1994), 25 and 144.

⁷⁴ Schubert et al, *The Whirlwind War*, 205; Richard M. Swain, "Lucky War" *Third Army in Desert Storm* (Fort Leavenworth: U.S. Army Command and General Staff College Press, 1994), 78, 82-83, 105-106, 157-161; Stephen A. Bourque, *Jayhawk! The VII Corps in the Persian Gulf War* (Washington, DC: Government Printing Office, 2002), 65; 22D Support Command, *22D Support Command After Action Report Executive Summary Desert Shield/DESERT STORM*. After Action Report, Command Reports 8-9.

⁷⁵ Davis, *Operation DESERT STORM: The Services' Efforts to Provide Logistics Support for Selected Weapons Systems*. Report to Committee on Armed Services, 35.

logistics units did not accumulate enough data on repair part history for precise tracking and, therefore, could not determine whether needed repair parts even actually made it into theater. The war ended before logistics units could establish a mature repair parts system in theater. The impact of limited visibility of available repair parts across theater was so detrimental to maintenance operations that in their final after action review, the 22D Support Command recommended a complete overhaul of the repair parts requisitioning system.⁷⁶ Inability to obtain the proper repair parts primarily affected the Army and Marines because the Air Force held adequate stocks of critical repair parts in their war readiness kits and conducted much of their maintenance at bases in Europe, and the Navy received necessary parts from their routine resupply ships.⁷⁷

The absence of central maintenance management also resulted in nonexistence in a unity of effort between the services when planning maintenance operations. The Department of Defense did not place stringent restrictions on the types of equipment units procured. Units ordered equipment, such as generators, in excess of their authorizations, increasing the maintenance burden on mechanics. Additionally, by ordering varying makes and models, the services increased the demand for a wider variety of repair parts and technical expertise to repair non-standard equipment. This led to the supply and transportation systems incurring even further strain as units simply ordered new replacement items for non-mission capable equipment.⁷⁸ The implementation of a central authority to manage maintenance operations would have established a unified standard across the services and ensured units ordered only authorized equipment that

⁷⁶ 22D Support Command. *22D Support Command After Action Report Executive Summary Desert Shield/DESERT STORM*. After Action Report (New York: 22D Support Command, 1991), 21-23 and 7-8.

⁷⁷ Dr. Eliot A. Cohen, *Gulf War Air Power Survey Volume III: Logistics and Support*. Review of air warfare in the Persian Gulf (Washington, DC: Government Printing Office, 1994), 307-310.

⁷⁸ Heiser, *Vietnam Studies: Logistic Support*, 17-18.

mechanics had the ability to repair. In turn, the encumbrance on both the supply and transportation systems would have been reduced as a fewer number of parts would require tracking and fewer pieces of equipment would require transport to and from forward units.

Even though Central Command did not designate the 22D Support Command as the operational level logistics manager in Operation DESERT STORM until after combat troops had already deployed to theater, the increased centralized control resulted in more immediate success than 1st Logistics Command achieved in the Vietnam War. The root of this success, however, stemmed from the urging of an experienced logistician, Major General Pagonis, to create this command. Implementation of the 22D Support Command was essentially an afterthought because planners did not account for a centralized logistics command in the initial planning efforts. This oversight of an operational level logistics manager would not occur in the Operation IRAQI FREEDOM.

Operation IRAQI FREEDOM

The final case, Operation IRAQI FREEDOM, shows the level of centralization achieved in the joint community during combat operations in Iraq (March 19-May 1, 2003). Taking into account the lessons from Operation DESERT STORM and the fact that rotational troops were already staged in Kuwait conducting a rotational training exercise, the initial logistical build-up encountered far fewer difficulties than previous conflicts. Furthermore, the United States Central Command planners did a much better job of integrating logistics subject matter experts into the planning process and designated a responsible operational level logistics authority prior to troop deployments. Gleaning command and control lessons learned both from the Vietnam War and Operation DESERT STORM, the Combined Force Land Component Commander Directorate of Logistics and the 377th Theater Sustainment Command Commander formed a Theater Support Command Center responsible for managing and coordinating logistics in Iraq. Although the 377th

Theater Sustainment Command assumed responsibility for all theater logistics during Operation IRAQI FREEDOM, planners overlooked the fact that the unit was primarily composed of reserve soldiers, which, in turn, took longer to mobilize. This affected the deployment of logistics troops into theater during this conflict, as had happened during previous conflicts, resulting once again in logistic shortfalls.

The central management of logistics during this conflict had the greatest effect on the Army and Marine ground forces due to the positioning of forces. The Air Force operated from the large air bases in Southwest Asia or Europe, simplifying their access to supplies, repair parts, and maintenance personnel, while the Navy received the required supplies from naval resupply ships. The re-supply of Army and Navy units relied on a coordinated effort to ensure sustained operations. For example, the 1st Marine Division prepared for a swift move north into Baghdad in 2003 by paring down the normal amount of supplies to only food, water, and fuel to reduce the overall load. In an order named “LOG LITE,” the Marines limited Meals Ready-to-Eat to two per day, hauled thirty gallons of water and thirty gallons of fuel on each High-Mobility Multipurpose Wheeled Vehicle (HMMWV), mounted fuel bladders on tanks, seized all Iraqi commercial fuel, and shut down vehicle engines if halted for greater than ten minutes.⁷⁹ They received their resupply from Army logistics units and the execution of rapid and precise logistics to the 1st Marine Division created the conditions ensuring they were able to continuously advance towards Baghdad.

The designation of the 377th Support Command as the operational level logistics manager increased the likelihood for integration of supply, maintenance, and deployment and distribution operations in theater. In this conflict, each core logistics capability could not function at full capacity without the efficient execution of the others because logistics operations in Operation

⁷⁹ Bing West and Ray L. Smith, USMA (Ret.), *The March Up: Taking Baghdad with the United States Marines* (New York: Bantam Dell, 2003), 78-79.

IRAQI FREEDOM followed markedly different concepts than those of both the Vietnam War and Operation DESERT STORM. Instead of relying on the buildup of stockpiles of supplies to draw from, sustainment relied on distribution-based logistics. Distribution based logistics is “limited inventory to cover small disruptions in distribution flow and enough supply to cover consumption between replenishments.”⁸⁰ If implemented properly, this system results in a smaller logistics footprint and increases cost savings benefits. Such a streamlined process requires intensive management to ensure nuances in the system do not disrupt sustainment operations. Executing a distribution based logistics system requires the emplacement of certain management tools, such as clear command and control mechanisms, in-transit visibility trackers, distribution managers, and pre-configured load packages, to create a systematic supply pipeline that feeds rapidly down to the combat unit. This distribution method requires transparent and timely visibility of supply levels all across the battlefield in order to deliver the necessary supplies forward as units deplete on hand stocks. Additionally, clear visibility allows distribution managers to allocate finite transportation assets to deliver required supplies to units spread across enormous areas of operations. Failure to emplace the proper systems results in even seemingly minor disruptions on the battlefield causing serious delays in re-supply to combat forces.⁸¹ The 377th Support Command’s problems with managing the distribution system impacted both supply and maintenance operations throughout the duration of combat operations.

Although the 377th Support Command implemented a conceptually more efficient method to deliver supplies to forward units, they still struggled to maintain joint logistics environment-wide visibility. Logisticians categorized supply operations during Operation IRAQI FREEDOM

⁸⁰ Eric Peltz, John M. Halliday, Marc L. Robbins, and Kenneth J. Girardini, "Sustainment of Army Forces in Operation IRAQI FREEDOM: Battlefield Logistics and Effects on Operations." (Santa Monica: RAND Corporation, 2005), xi.

⁸¹ Peltz et al, "Sustainment of Army Forces in Operation IRAQI FREEDOM: Battlefield Logistics and Effects on Operations," xi-xiii.

as “just in time logistics,” a concept that relied heavily on distribution capability in order to work. “Just in time logistics” is a distribution method that delivers the supplies directly to the requestor based off only what the requestor ordered. The aim of this method was to prevent large stockpiles of supplies in theater that logistics soldiers would be required to process and inventory. This method intended to streamline the entire supply and distribution network since the large theater of operations and high operational tempo already put an immense strain on the logistics systems. When planning the invasion of Iraq, U.S. Central Command realized that the protection of supply lines was critical because both the Army and Marines relied heavily upon the “just in time” logistics concept to move quickly towards Baghdad. A 350-mile long logistics pipeline required accurate logistical calculations and unimpeded supply lines to keep combat forces logistically supported.⁸² The physical distances were long and logistics units barely had enough transportation assets to push critical supplies forward.⁸³ Additionally, although the military used joint logistics over the shore, the offshore unloading and loading of ships, in an attempt to alleviate some of the congestion issues at Kuwaiti ports, it was inadequate for the problem. Once supplies reached warehouses in Kuwait, in-transit visibility still became an issue. First, the established communications infrastructure was ineffective in a fast-paced, combat environment. Units were too engaged in combat operations to use the systems as they were intended, did not have time to set up the requisitioning systems. Secondly, units physically outpaced their logistics, so once their requested supplies reached their location for issue, the unit had already moved forward. Finally, scarce transportation assets in theater forced the corps deputy commanders to review and approve the allocation of truck assets on a daily basis.⁸⁴ The requirement for a Deputy

⁸² Williamson Murray and Robert H., Jr. Scales. *The Iraq War* (Cambridge: The Belnap Press of Harvard University Press, 2003), 94-95.

⁸³ Colonel Gregory Fontenot, E.J. Lieutenant Colonel Degen, and David Lieutenant Colonel Tohn, *On Point* (Washington, DC: Government Printing Office, 2004), 333-334.

⁸⁴ Fontenot, *On Point.*, 406-411.

Commander to manage theater transport assets could have successfully been executed by the 377th Support Command if had already established a process, instead, deputy commanders spent energy on this logistical task vice devoting his energy towards more pressing problems.

The distribution based logistics system during Operation IRAQI FREEDOM did not outline a clear command and control structure. Brigadier General Vincent E. Boles, the Army Materiel Command Commander, even stated after the war, "I think the one thing that hinders us more than any other is there is no one entity in charge of battlefield distribution."⁸⁵ No one command retained responsibility for managing theater-wide joint logistics environment visibility and developing an interconnected distribution plan. The divisions, corps support command, and theater support command each conducted their sustainment planning in a vacuum, only making assumptions as to the level of support the other echelons would be providing. Since the logistics community did not integrate the entire plan, no true requirement for the necessary distribution assets was ever developed. As a direct result, combat planners pushed entire truck companies and warehousing companies to the rear of the force flow to build up combat power because they did not understand how the lack of these companies affected distribution efforts across the entire theater.⁸⁶ Once logistics planners identified the mistakes in force flow, the inflexibility in the deployment process restricted changes. Although Transportation Command had many steps taken to streamline the deployment of troops and equipment since Operations DESERT STORM, problems remained. The phasing of troops into Saudi Arabia based on mission requirements, which sought to align troops and equipment into theater by priority, proved inflexible to rapid deployment. As the Transportation Command allocated troops and equipment against the limited

⁸⁵ Brigadier General Vincent E. Boles, interview by Randy R. Talbot. Oral History Interview with BG Vincent E. Boles, Commanding General, Army Materiel Command, Southwest Asia, Deputy C-4, Coalition Land Forces Command (June 24, 2003), 13.

⁸⁶ Peltz et al, "Sustainment of Army Forces in Operation IRAQI FREEDOM: Battlefield Logistics and Effects on Operations," 17-25.

airlift and sealift assets, the ability of operational level commanders to adjust the force flow supporting operational requirements was constrained. Central Command made the decision to switch the flow of troops into theater via force packages instead of deploying troops into theater contingent to the ever-changing operational environment. Transportation Command was unable to make effective adjustments to the limited number of strategic lift assets to meet the rapidly changing force requirements. Since planners prioritized sustainment units further back in the force flow in order to move combat troops into theater more quickly, many units deployed forward without the proper logistical support. For example, 1st Marine Expeditionary Force had to contract civilian trucks to move their equipment because the Army logistical units, that would normally execute common user land transport operations had yet to arrive in theater.⁸⁷

Units experienced multiple maintenance problems during combat operations due to the difficulties in the supply and distribution core capabilities. Inadequate requisitioning methods and the poor distribution system caused an enormous strain on maintenance operations. As equipment broke down, units did not receive any repair parts. Key leaders attributed this failure to a requisitioning process that had to pass through several echelons prior to being processed. Additionally, once a repair part arrived in theater, no effective distribution system existed to get the right part to the right unit. Due to poor communications, units were unable to order critical repair parts. The technology emplaced for units to order parts required line-of-sight communications in order to transmit the data. Not only did technology corrupt the transmissions when sent, but also most of the time the distances were too great for units to even transmit data. Some units resorted to manual requisitions via satellite telephones, however, reception was intermittent, and the process was time-consuming. The priority for distribution was water, food, and fuel. Transportation assets were so overwhelmed with the delivery of these three

⁸⁷ Fontenot, *On Point*, 73-75.

commodities, that there was rarely enough space to accommodate the delivery of repair parts and lubricants, especially since logistics planners had given them a much lower priority. Without access to repair parts, maneuver units quickly depleted all on hand stocks and mechanics resorted to cannibalization to keep equipment running. Readiness rates quickly fell to below the accepted 90% readiness rate on most fleets. Units even went as far as deeming equipment operational as long as it could shoot, move, and communicate.⁸⁸ Fortunately, ground forces seized Baghdad prior to the lack of repair parts completely stalling forward movement.⁸⁹

Operation IRAQI FREEDOM is a prime example of how a unified logistics command would have “contributed to the creation of a system better able to manage scarce resources globally and coordinate support across all levels of warfare.”⁹⁰ Tactical ground units experienced the brunt of the logistical shortfalls during this conflict mostly due to the inadequate communications network, which limited visibility, and the poorly managed distribution network.⁹¹

At the conclusion of combat operations in Operation IRAQI FREEDOM, the 377th Theater Support Command had just begun to see success in synchronizing supply, maintenance, and deployment and distribution operations. Although Central Command had designated the 377th Theater Support Command as the theater logistics manager prior to the deployment of combat troops, the time it took them to mobilize resulted in setbacks establishing logistics operations in theater. These difficulties led the Department of Defense to re-look logistics management

⁸⁸ Peltz et al, "Sustainment of Army Forces in Operation IRAQI FREEDOM: Battlefield Logistics and Effects on Operations," 38-54.

⁸⁹ Fontenot, *On Point*, 149, 333-334.

⁹⁰ Lieutenant Colonel Frank Wenzel, "Should the Department of Defense establish a Unified U.S. Logistics Command?" Washington, DC: Government Printing Office, 2008), 50.

⁹¹ Lieutenant Colonel Michael W. Snow "Focused Logistics: Putting Agility in Agile Logistics." (Washington, DC: Government Printing Office, 2011), 45.

organizations after the war resulting in the current theater command structure the military uses today.

Conclusion

In each of the three cases studied, logistics never prevented combat troops from completing their mission; however, increased centralization over time improved many aspects of logistics operations. To demonstrate these patterns of increased centralization since the beginning of the Vietnam War, the case studies utilized three of the seven-core capabilities- supply, maintenance operations, and deployment and distribution, that had reverberating long-term effects when improperly managed from the commencement of a conflict. These core capabilities permit each individual service to maintain a common framework and establish a common language for collaboration between services. During each conflict, similar trends emerged within each core logistics capability; however, increasingly greater centralization during every subsequent conflict enabled the problematic trends to reach resolution at an earlier stage in combat operations. Of the three core logistics competencies reviewed, deployment and distribution and supply affected combat units the most when not properly managed.

During all three conflicts, logisticians consistently struggled to manage supply operations effectively. Comparable trends presented themselves even though the Department of Defense had increased centralization. Poor visibility, insufficient processes, and inflexibility caused disruptions in the flow of supplies from the vendor to the requisitioning unit. At the operational level, the responsible theater-level logistics manager rarely gained visibility of supplies until the logistics units received the supplies in theater. Thousands of containers arrived in theater without proper documentation, requiring these supplies to be re-inventoried, input into the requisitioning system, and re-packaged for transport forward to combat units. Furthermore, the delayed deployment of logistics units into theater resulted in a supply operations backlog from the onset of theater buildup due to an inadequate labor force to execute all necessary supply operations.

Deployment and distribution operations experienced similar difficulties. Planners during the Vietnam War and Operation DESERT STORM conflicts prioritized units that executed the deployment and distribution functions further back in the force flow in favor of building combat power resulting in insufficient capability to execute these operations. Realizing this error prior to Operation IRAQI FREEDOM, planners designated logistics units to execute this function prior to the onset of forces' deployment into theater. Planners failed to realize, however, that reserve units comprised the bulk of the type of units that execute this core logistics function and they were unable to meet deployment timelines to provide required support to active duty combat troops that quickly deployed into theater. At the operational level, insufficient numbers of transportation assets hindered the movement of supplies, personnel, and equipment around the battlefield. United States Transportation Command, the agency responsible for coordinating and overseeing the Department of Defense's distribution system, did not provide the interoperability, synchronization, and alignment for the entire distribution system. Additionally, in Operation DESERT STORM and Operation IRAQI FREEDOM, only enough distribution assets were available to transport critical supplies such as food, water, and fuel during actual combat operations and Central Command averted logistic disaster only because its forces had access to enough helicopters to deliver critical shortfalls in supplies during combat operations.

The trend in maintenance operations in each conflict was to repair equipment with parts already on hand and not to expect rapid and precise delivery of repair parts once combat operations commenced. Because the success of maintenance operations relied heavily on the proper functioning of supply and distribution operations and the system often failed to deliver these parts promptly, units relied on the technical expertise of their mechanics. As long as the mechanic received the necessary repair parts, he or she demonstrated the ability to keep equipment operational on the battlefield. Mechanics were even capable of maintaining equipment readiness through cannibalization and controlled substitution when the proper repair parts were

not available. Adequate amounts of repair parts were generally available in each theater, it was just a matter of ensuring units received the required parts when necessary.

As we look at the Vietnam War, Operation DESERT STORM, and Operation IRAQI FREEDOM, increases in the level of logistics centralization is evident. At the onset of the Vietnam War, no one logistical command held responsibility for theater sustainment.⁹² Four years into the war, the Military Assistance Command Vietnam appointed the 1st Logistics Command to perform as the operational level logistics manager. After Vietnam, the Department of Defense recognized the requirement for each component commander to have a logistics management capability that includes a senior logistician and staff capable of planning for contingency operations and deployment forward with combat troops.⁹³

The United States Central Command did not designate a single logistics authority in theater prior to the onset of Operation DESERT STORM, however, an experienced logistician, Major General Pagonis, realized the need for such an authority, and established one as soon as troops started deployment into theater. By identifying this shortfall much earlier in the war than planners had in the Vietnam War, logistics units gained more preparation time to support combat operations. As the 22D Support Command Commander, Major General Pagonis implemented a system to attain direct control of “all Combat Service Support assets within the echelons above corps, plus those whose timely interface directly affected mission accomplishment.”⁹⁴ Although this method of centralization ultimately allowed for adequate sustainment of forces in theater, designating an ad hoc organization to provide critical support only succeeded because of the hard work and innovation of the individuals unwittingly placed there. The 22D Support Command

⁹² United States Army, Vietnam. *The Logistics Review U.S. Army Vietnam: 1965-1969 Volume I: System Overview*. Study (Washington, DC: Government Printing Office, 1970), II-1.

⁹³ Heiser, *Vietnam Studies: Logistic Support*, 258.

⁹⁴ 22D Support Command. *22D Support Command After Action Report Executive Summary Desert Shield/DESERT STORM*. After Action Report (New York: 22D Support Command, 1991), Slide 55.

Commander recognized the importance of implementing a logistics command designated as a single point of contact in theater to orchestrate all sustainment functions. To be successful, the geographic combatant commander must designate this unit prior to the deployment of any combat troops and involve these logisticians in the initial planning. After Operation DESERT STORM, the 22D Support Command outlined a need to change doctrine because of inadequate logistics centralization.

During Operation IRAQI FREEDOM, planners identified the necessity in the initial planning phases to centralize logistics management within the theater. In this conflict, the geographic combatant commander designated an operational level theater logistics authority prior to the deployment of combat troops. Unlike the 1st Logistics Command and the 22D Support Command, the 377th Support Command was not an ad hoc command organization. It was a pre-existing headquarters designed specifically for the task of managing logistics at the operational level. Since they were a reserve unit, the 377th Support Command and its subordinate units did not mobilize as quickly as the active duty units, which hindered them from gaining control of all the logistics management functions once deployed into theater.⁹⁵

After the fall of Baghdad in March 2003, the Defense Logistics Agency identified the requirement for a more centralized distribution management agency. In 2004, they created the Joint Deployment Distribution Operations Center. Their mission is “to support the geographic Combatant Commander’s operational objectives by synchronizing and optimizing the inter-theater and intra-theater distribution aspects of deployment and multi-modal transfer resources to integrate the proper mix of flow of forces, materiel, and other forms of sustainment in support of

⁹⁵ Headquarters, United States Joint Forces Command. *Joint Lessons Learned: Operations IRAQI FREEDOM Major Combat Operations*. After Action Review (Washington, DC: Government Printing Office, 2004), 89-90.

the geographic combatant commander missions.”⁹⁶ The U.S. Transportation Command designated the Joint Deployment Distribution Operations Center as the theater’s “single point of contact for all deployment and distribution operations.”⁹⁷ U.S. Transportation Command created a Joint Deployment Distribution Operations Center for each Geographic Combatant Commander, authorizing that Commander to locate it in the most feasible location for responsive support. The Joint Deployment Distribution Operations Center is the Geographic Combatant Commander’s direct link to operational level distribution activities within the theater. This link ensures the commander maintains a common operating picture of sustainment in order to plan and prioritize the mission in conjunction with logistical capacity.⁹⁸

The next step the Department of Defense took to centralize logistics management at the operational level occurred during the implementation of modularity. On September 14, 2004, the Chief of Staff of the Army approved the new organization, reducing the number of logistics command layers from four to three, and streamlining command and control. This new headquarters element, called the theater sustainment command, assumes the role as the sole responsible logistics manager in a theater of operations. The theater sustainment command supports joint, Army, interagency, and multinational forces, plans, controls, and synchronizes logistics for the joint commander, acts as the single log command and control element, and proponent for distribution, supply, maintenance, and life support, and coordinates inter and intra-theater logistics. The new design leverages joint partnerships for an end-to-end logistics capability, and provides the ground or joint forced commander a single logistics commander.

⁹⁶ Doctrine Group Joint Warfighting Center, *Pamphlet 8: Implications of the Joint Deployment Distribution Operations Center* (Washington, DC: Government Printing Office, 2006), 12.

⁹⁷ *Ibid.*, 12.

⁹⁸ *Ibid.*, 12-13.

Theater sustainment command also has the capability to deploy up to three forward command posts, increasing management effectiveness in targeted areas of operation.⁹⁹

As the United States' three previous conflicts have demonstrated, there are many benefits to increasing logistics' centralization at the operational level, but does this indicate that increased centralization is the right answer? Although more study may be required, the initial indication, based on the importance of managing the core logistics capabilities, is "yes." The ability to integrate all three functional capabilities within the supply core capability synchronizes responsive supply operations. Pre-positioning supplies, maintaining optimal stockage levels, and accounting for materiel in the system ensure resources shortages do not interrupt combat operations. The ability to rapidly surge and cross-level resources across services increases the effectiveness in any contingency with the presence of an inherent relationship.¹⁰⁰ Maintenance operations present challenges within a joint force because of interoperability issues; however, central management, over time, forces a standardization of certain equipment types, leading to a reduction in the overall repair parts variations and required repair technical skill sets. Some may consider deployment and distribution the most integrated core logistics capability already because execution of this capability requires the cooperation of each service to operate proficiently. As required by Title 10, effective management of these core capabilities "ensures a ready and controlled source of technical competence and resources necessary to ensure effective and timely response to a mobilization, national defense contingency situations, and other emergency requirements."¹⁰¹ Furthermore, these core capabilities serve as a gauge to ensure the military

⁹⁹ Major General Ann E. Dunwoody, *Logistics Transformation*. Briefing to Senior Army Reserve Commander's Association (Washington, DC: Government Printing Office, 2005), Slides 3, 9, 10.

¹⁰⁰ U.S. Department of Defense, *Joint Publication 4-03*. (Washington, DC: Government Printing Office, 2010), II-5.

¹⁰¹ General Military Law. United States Code Title 10. Part IV, Chapter 146, paragraph 1.

retains its ability to project a competent, capable fighting force, as required, but also to ensure the military remains a good steward of public resources.¹⁰²

Although the path to developing an organization that increases centralization of logistics at the operational level has been wrought with commands experiencing some of the same mistakes encountered in the Vietnam War, Operation DESERT STORM, and Operation IRAQI FREEDOM, the Department of Defense clearly aims to rectify previous management problems through the creation of the theater sustainment command. Combatant commanders must also implement an effective method to manage the core logistics capabilities to sustain the operational needs of each service. Even though the enemy did not destroy any critical U.S. logistical capability in previous recent conflicts, greatly easing the pressure on sustainment forces in theater, the combatant commander cannot rely on such success when planning future conflicts.¹⁰³ A more formidable enemy, able to destroy significant portions of our logistics capacity, may possess the capability to impede the logistics balance that the U.S. military has always enjoyed. If this occurs, the existence of a single theater logistics manager becomes even more critical to prioritize and manage supply, maintenance, and deployment and distribution operations. Additionally, the lessons learned regarding how well the operational level logistics manager achieves the joint logistics imperatives influence the success of executing the core logistics capabilities. Proper unity of effort ensures all parties understand how processes in the system work, assign clear roles and responsibilities, agree on common performance measures within the system, and retain visibility of the processes. Accurate Joint Logistics Environment -wide visibility streamlines resources, increases readiness, and assures users of the reliability of joint logistics. Rapid and precise response ensures units receive the necessary supplies when required

¹⁰² General Military Law. United States Code Title 10. Part IV, Chapter 146, paragraph 3-4.

¹⁰³ V.K.Nair, *War in the Gulf: Lessons for the Third World* (New Delhi: Lancer International, 1991), 152-153.

to sustain combat operations. If the theater sustainment command applies these joint logistics imperatives when managing the core logistics capabilities, the Department of Defense's decision to increase centralization to the level it is today will be justified.

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