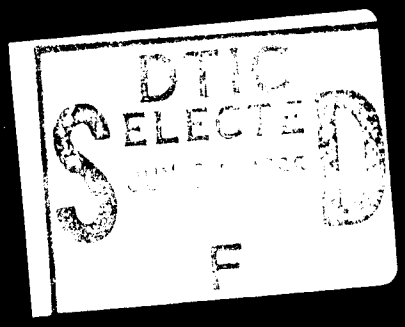


Naval Doctrine Publication 4

Naval Logistics

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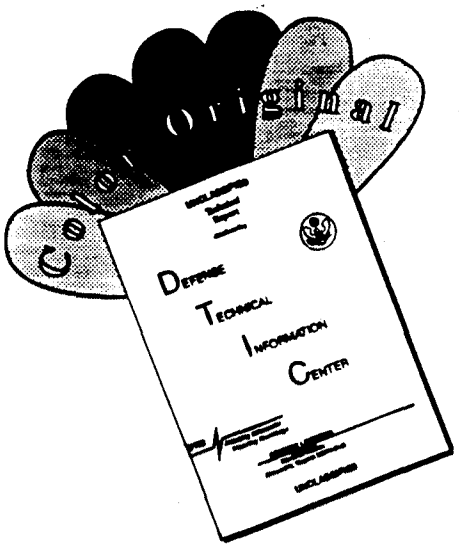
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NAVAL LOGISTICS

"Sea power means more than the combatant ships and aircraft, the amphibious forces and the merchant marine. It includes also the port facilities of New York and California; the bases in Guam and Kansas; the factories which are the capital plant of war; and the farms which are the producers of supplies. All these are elements of sea power."

– Fleet Admiral Chester W. Nimitz,
Chief of Naval Operations, 1947

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OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON, DC 20350-2000
AND
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WASHINGTON, DC 20380-0001

10 January 1995

FOREWORD

Naval logistics is the *sine qua non* of our combat power and is the bridge that connects our nation's industrial base to forward-deployed naval forces.

Whether appearing in the form of effective peacetime forward presence or decisive power projection, readiness and the ability to sustain such operations are the hallmarks of our Navy-Marine Corps team—and both readiness and sustainability hinge upon logistic support. Certainly, effective logistic support will not always guarantee success; lack of such support, however, inevitably will bring failure.

Naval Doctrine Publication (NDP) 4, Naval Logistics, is the fourth in the series of capstone publications that articulate naval doctrine. Every naval professional must understand its contents. NDP 4 discusses the basis of operational naval logistics and establishes the foundation for development of follow-on tactics, techniques and procedures, which will be contained in a later series of logistic Naval Warfare Publications (NWPs), 4-0.

J. M. BOORDA
Admiral, U. S. Navy
Chief of Naval Operations

C. E. MUNDY, JR.
General, U. S. Marine Corps
Commandant of the Marine Corps

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INTRODUCTION

Our nation's military power always has been a reflection of our ability to equip, train, and support our forces. Each of these areas—equipment, training, and support—is essential, a link in a chain. Inevitably, however, our newest, most capable weapon systems will deteriorate and even the best-trained personnel will lose their effectiveness quickly if denied proper support. Providing such support requires a detailed, smoothly functioning infrastructure—and the experienced, dedicated professionals to make it work.

NDP 4, Naval Logistics, describes how we apply fundamental logistic principles, functions, and elements and how we use the resources of formal planning and logistic information support to attain the basic goal of operational force readiness. Through the metaphor of a logistic pipeline, it takes the reader from the manufacturer's shipping terminal to the end user. At the same time, it emphasizes that naval logistics means much more than materiel. It is a complex weave of systems within systems, which encompasses planning, acquisition, maintenance, engineering support, training, transportation, facilities operations, and personnel support—backing up naval forces day and night, in peace and war.

History records many examples of presence operations shifting quickly into armed conflict, at much higher levels of operational intensity. Both peacetime operations and naval warfare demand that effective logistic support be in place and functioning under all conditions. NDP 1, Naval Warfare, describes the ways naval forces accomplish their missions and execute their roles with joint and multinational teams; Naval Logistics explains how the support for those operations is planned, acquired, and integrated into the operations of naval expeditionary forces—whose ability to accomplish their missions is linked directly to the strength of the logistic chain and the quality of the support it provides, especially when resources are limited.

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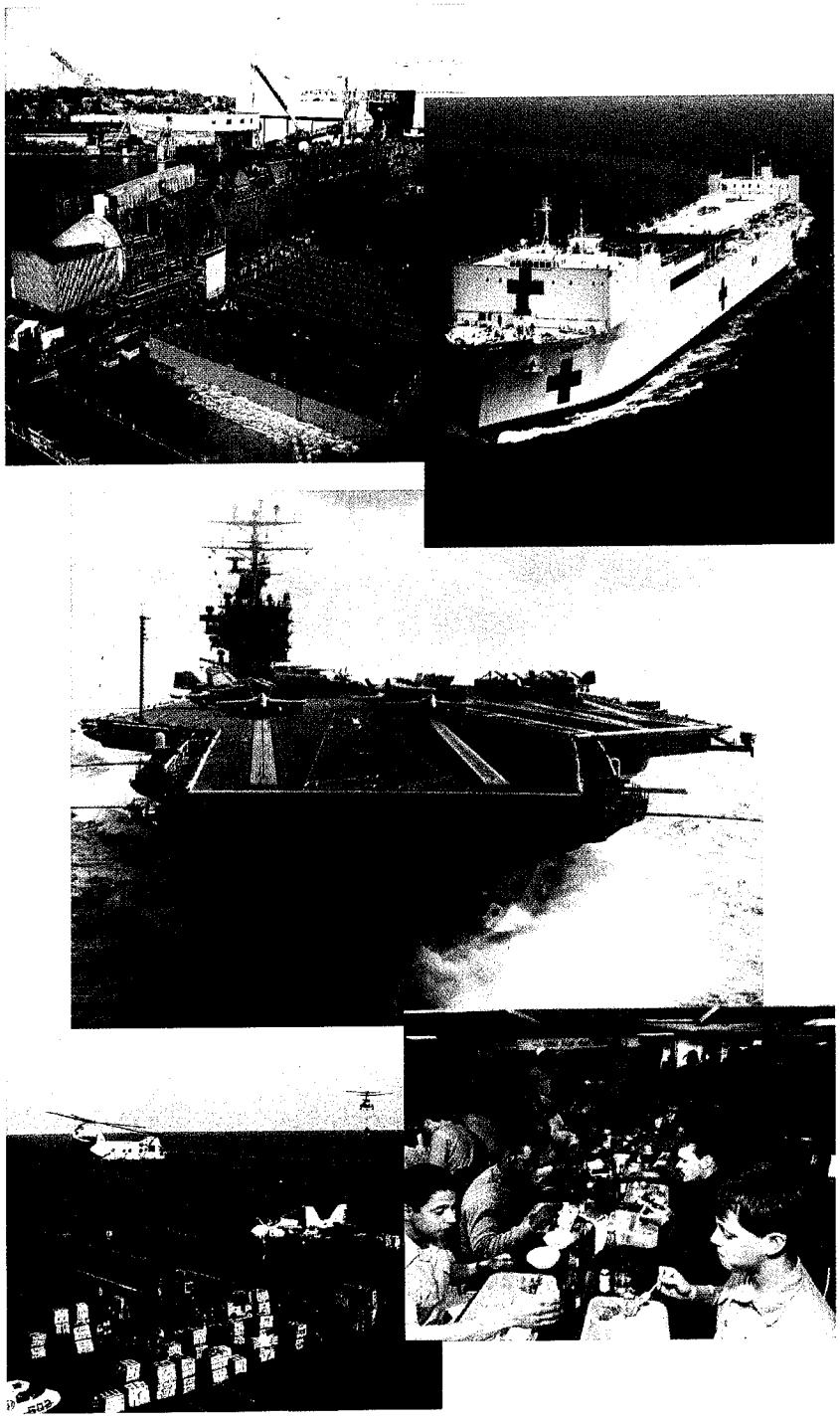
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CHAPTER ONE

The Nature of Naval Logistics

"Logistics provides the physical means for organized forces to exercise power. In military terms, it is the creation and sustained support of combat forces and weapons. Its objective is maximum sustained combat effectiveness."

— Rear Admiral Henry Eccles, USN, (Ret.)

Naval forces contribute decisively to U.S. global leadership, and are vital in shaping the environment needed to enhance national security. A strong naval team—capable of deterrence, war at sea and from the sea, and operations other than war—is essential to that effort. Key to the strength of our naval team is naval logistics—the total integration of highly trained and dedicated personnel within a complex network of technical support, facilities, transportation, materiel, and information links.

Logistics enables us to carry out our assigned roles.[1] It supports our ability to conduct continuous forward presence, peacetime engagement, deterrence operations, and timely crisis response in the complex maritime environment. Our success in the day-to-day missions that support these roles depends on both capability and credibility. We demonstrate capability through weapon-system design, operator training, and operations performance. Credibility hinges on our being able to sustain this capability by supporting our forces effectively in peace and war. Such support comes from a multitude of sources, and is an important indicator of our combat readiness, a factor other nations recognize and respect.

Day-to-day operations require our forces to operate in both the open ocean and along the world's littorals—and to be capable of remaining in these areas indefinitely. Naval logistics lets us be expeditionary, enabling naval forces to conduct complex operations around the world wherever needed in support of national interests and objectives. The striking power of the Navy and Marine Corps is always available without delay, and is sustainable by virtue of an established support system that employs organic stocks, logistic support ships, advanced support bases, airlift, and sealift.

Sustained forward deployed operations allow our nation to engage in regional coalition-building and collective-security efforts. In the future, major conflicts will be dealt with by joint and multinational forces, so the naval logistic structure is designed to provide support to other services and allies. Our forces also benefit as the logistic infrastructure matures in theater, with added support from multinational partners and host nations. Wherever our naval forces may be involved, their logistic support ensures immediate readiness.

Naval logistic operations are conducted much the same in peace as they are in war. The major differences in war are that the magnitude of personnel-support functions and the quantity of materiel and supplies needed—as well as corresponding airlift and sealift requirements—will increase, and that our systems become subject to disruption by

[1] NDP 1 Naval Warfare, discusses the basic roles of our naval forces as assigned by Congress.

enemy action and the fog (friction and uncertainty) of war resulting in erroneous assumptions and planning shortfalls. So in war, our basic structure and methods of delivery must be rugged and strong—much more than merely adequate. Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms, defines logistics as "the science of planning and carrying out the movement and maintenance of forces." As illustrated in Figure 1-1, this science focuses on sustained operational readiness from day one—not just preparation for specific operations. Effective logistic support requires balancing the commander's requirements with the resources available. Defined broadly, naval logistics consists of *products* provided to the end user—equipment, supplies, facilities, services, and trained manpower; and *processes* used to provide and maintain those products—production, procurement, distribution, training, and maintenance.

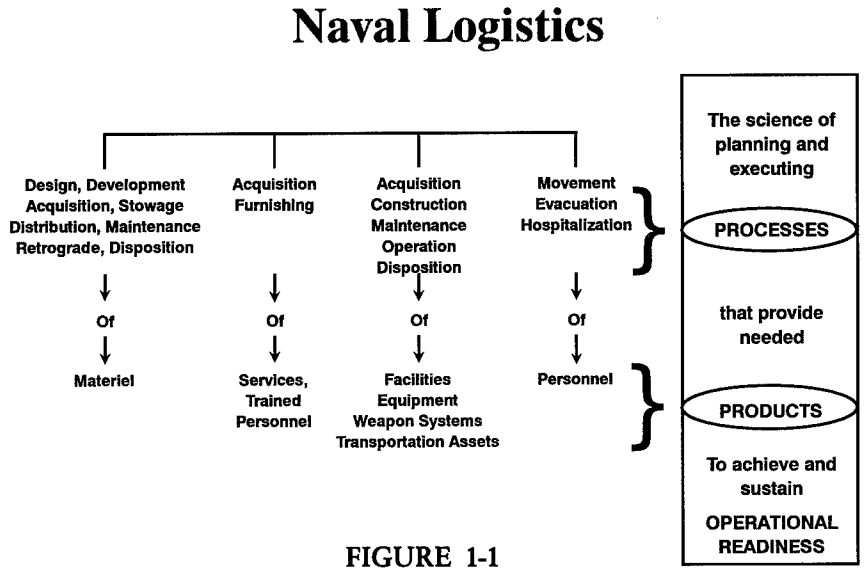


FIGURE 1-1

With a proper understanding of the complexities of logistics, we can employ and protect this vital component of our operational readiness and warfighting capability. Such understanding begins with a look at the mission of naval logistics, followed by the levels of logistic support.

Mission of Naval Logistics

In peace and war, the mission of naval logistics is to provide and sustain our operational readiness by getting the right support to the right place at the right time. In peace, operational readiness stems from the ability of our naval forces to accomplish a wide range of day-to-day taskings. In war, operational readiness is the forerunner of warfighting effectiveness.

The philosophy of maneuver warfare focuses on attaining victory by neutralizing the enemy's centers of gravity and destroying his will to resist. Naval forces use the sea as maneuver space, searching for weaknesses in the enemy's defenses. When the commander finds a weakness that is both critical to the enemy's existence and vulnerable to attack, he establishes this critical vulnerability as the focus of effort. He then unifies his force toward the focus of effort by designating the main effort. Guided by an understanding of the commander's intent, the subordinate commander leading the main effort is able to operate independently at a high tempo that overwhelms the enemy.

A major challenge to our naval logistic system is the need to support the main effort at its high tempo of combat while continuing to support all other efforts adequately. Our system must anticipate the needs of many operating forces and integrate all six functional areas of logistics[2] in a responsive manner. This requires planners to ensure that the logistic pipeline–stretching from such sources as the continental U.S. infrastructure to the forward-deployed end user–consistently will enable naval commanders to exploit opportunities as they arise. The maneuver warfare philosophy encourages subordinates to exercise initiative and gives them freedom to react to war's uncertain and fluid nature; the naval logistic philosophy complements this thinking, emphasizing that its planners must anticipate and respond quickly to operational needs. Uninterrupted logistic flow is essential in maintaining momentum at all levels of logistic support.

[2] The logistic functional areas–Supply, Maintenance, Transportation, Engineering, Health Services, and Other Services–are discussed in Chapter Two.

Levels of Logistic Support

Logistic support is provided at the strategic, operational and tactical levels, and involves interrelated and often overlapping functions and capabilities:

Strategic logistics encompasses the nation's ability to deploy and sustain its operating forces in executing the national military strategy. It is concerned with determining requirements, personnel and materiel acquisition, management of air and sealift for strategic mobility, and support of forces in distant theaters of operations. It also includes the role of prepositioned equipment and materiel—both afloat and ashore—and our nation's ability to maintain the required support levels for operations of any duration. Long-term sustainment is tied directly to the national industrial bases, which include the nation's manufacturing, agricultural, transportation, and health services sectors. Such organizations as the Defense National Stockpile Center play a strategic role in maintaining raw materials that would be needed to support a significant buildup of the industrial base. A particular concern at the strategic level is that our industrial bases maintain the capability, capacity, and technology to support timely production of modern weapon systems, support equipment, health services, munitions, stores and command-and-control systems to meet wartime requirements.

Operational logistics involves coordinating and providing intratheater logistic resources to operating forces, and primarily concerns the Unified combatant commanders and the Service component commanders. It includes support activities required to sustain campaigns and major operations within a theater and is the level at which joint logistic responsibilities and arrangements are coordinated. Operational logistics encompasses theater support bases and facilities and the theater surface, air, and sealift required to transport the personnel and materiel to the supported forces—as well as managing and protecting those assets after they have delivered their materiel and services. It provides our linkage to the strategic level and enables us to succeed at the tactical level.

LEVELS OF LOGISTIC SUPPORT

The Marianas Campaign

The American campaign to seize the Pacific's Mariana Islands group in World War II highlighted the **strategic, operational,** and **tactical** levels of naval logistic support.

During the second half of 1943, Allied leaders strengthened the offensive effort against Japan. They complemented the Southwest Pacific Command's push through the Philippine Islands with a campaign by the Central Pacific Command to seize key island groups in its area of operations. Capture of the Gilberts, Marshalls, and Marianas would enable the Allies to bring devastating air and naval power directly against the Japanese home islands. This expanded effort was possible only because American factories were by then pouring out tens of thousands of warships, merchant vessels, landing craft, aircraft, tanks, munitions, and supplies. At the same time, replacement depots were sending millions of fresh troops. In short, resources were available at the **strategic** level to fuel and sustain a broad, Pacific-wide offensive.

The Navy's logistic resources at the **operational** level—in particular, the campaign to capture the Marianas—also were critical to success in the Central Pacific. These islands were 3,500 miles from Pearl Harbor, the Navy's major Pacific shore establishment, and 1,000 miles from Eniwetok, the site of an advanced logistic staging area created when Admiral Raymond A. Spruance's Fifth Fleet forces stormed the Marshall Islands in January and February 1944. To overcome the lack of close-in shore bases, the Navy created an afloat, mobile logistic force for the Marianas campaign—Rear Admiral Worrall R. Carter's Service Squadron 10. Over a period of three months in the summer of 1944, this task group provided the primary logistic support for a Marianas invasion force of 535 combatant ships and 128,000 Soldiers and Marines. The Navy then carried out a massive air and naval base construction program in the captured islands, employing Navy SeaBees and Marine support units. This effort enabled U.S. B-29 Superfortress bombers and naval combatants to launch what proved to be the final assault on Japan in the spring and summer of 1945.

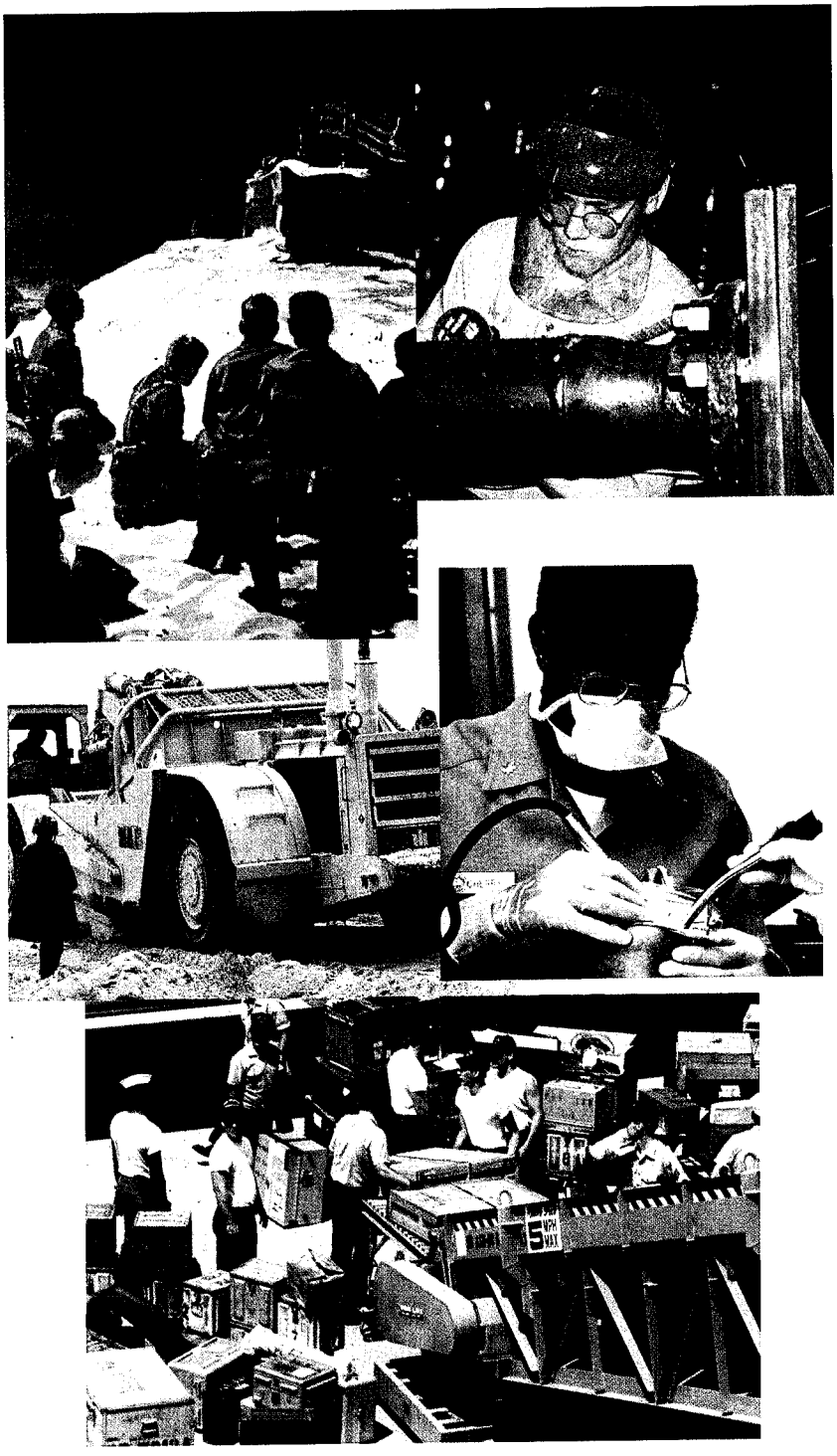
The amphibious assault on Saipan, the first operation of the Marianas campaign, displayed the versatility of naval logistic forces at the **tactical** level. On hand to support and sustain the operation, which lasted from 15 June to 7 July 1944, were a host of fleet oilers to refuel at sea aircraft carriers, battleships, and other combatants; enough repair and salvage ships to keep battle-damaged units in the fight; seaplane tenders to serve the needs of critical long-range reconnaissance and rescue aircraft; and provisions, stores, and ammunition ships to provide the necessary food, clothing, and ordnance. Finally, hospital ships were positioned close to Saipan to care for the thousands of wounded U.S. servicemen who survived the bloody fight ashore.

Tactical logistics focuses on planning and support within and among operating units of the task force or battle group. The tactical commander at this level draws upon resources made available at the operational level. Navy tactical logistics encompasses the logistic support of forces within a battle group, amphibious readiness group and Navy elements ashore, from both afloat platforms–including the Combat Logistics Force–and shore-based logistic support facilities. The tactical-level support functions include maintenance, battle-damage repair, engineering, cargo handling, fueling, arming, moving, sustaining, materiel transshipment, personnel, and health services. Marine Corps tactical logistics, combat service support, is provided by a combat service support element–organized to provide maintenance, supply, motor transport, medical, dental, engineering and landing support–which complements the organic logistic capabilities of the aviation and ground combat elements.[3]

This proper mix of logistic support is provided by organizations that begin with the manufacturer, training facilities, and depots, and end with the needed products, trained personnel, transportation assets, equipment, and services that support the user. This spans the strategic, operational and tactical levels of logistics, consisting of support organizations that are manned with high-quality, well trained personnel from active and reserve forces and the civilian sector. Continuity of logistic support–in providing an uninterrupted flow of supplies, maintenance, transportation, health service, combat engineering and personnel-related services–is paramount to success.

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[3] The Marine air-ground task force is composed of a command element, ground combat element, aviation combat element, and a combat service support element. The Marine air-ground task force element is discussed further in Chapter Four.



CHAPTER TWO

Fundamentals of Naval Logistics

"To be a successful commander at any echelon, you had better think about logistics and you had better make sure that when you are ready to go you have enough fuel, beans, bullets and bandages—all of the things to sustain your force."

— General Carl E. Mundy, Jr., USMC
Commandant of the Marine Corps, 1993

Principles, functions, and elements of the logistic process are fundamental to the mission of supporting operational readiness. Combined as shown in Figure 2-1, these fundamentals define the naval logistic process–providing the proper products and right level of support to the fleet and force. The following discussion of these interrelated fundamentals will provide insights into the complexity and essential capabilities of naval logistics.

The Naval Logistic Process

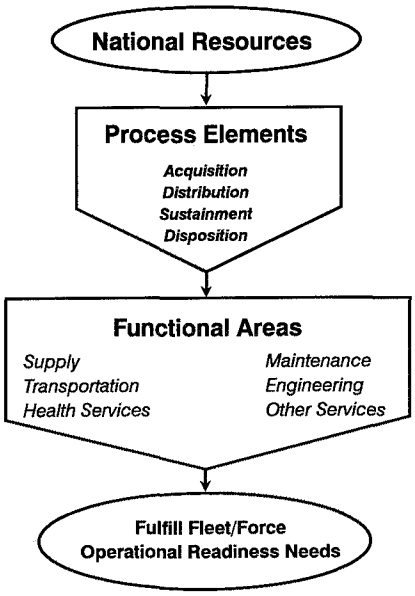


FIGURE 2-1

NDP 1, Naval Warfare, describes the principles of war,[4] which apply to combat everywhere. The logistic corollary to the principles of war are: responsiveness, simplicity, flexibility, economy, attainability, sustainability, and survivability. They serve as a guide for planning and conducting logistic support of naval operations. Both the operational force commander, who needs to know the effective limits of the available logistic support, and the logistic planner, who has to ensure that all the essential elements and full capacity of the logistic system are incorporated, must understand these principles. They represent the strengths we seek in our support mechanisms and illustrate potential vulnerabilities to be exploited in attacking the enemy's logistic system.

[4] The principles of war are: objective, mass, maneuver, offensive, economy of force, unity of command, simplicity, surprise, and security.

Principles of Logistics

Responsiveness. *Providing the right support at the right time, at the right place.* This is the most important principle of logistics. Ensuring that adequate logistic resources are responsive to operational needs should be the focus of logistic planning. Such planning requires clear guidance from the commander to his planners; also, it requires clear communication between operational commanders and those who are responsible for providing logistic support. The operational commander's concept of operations must be thoroughly familiar to the supporting elements—to ensure responsive, integrated support. Responsiveness is a product of logistic discipline, as well. Commanders and logisticians who consistently overestimate their requirements—in quantity and priority—risk slowing the system's ability to respond.

Simplicity. *Avoiding unnecessary complexity in preparing, planning and conducting logistic operations.* Providing logistic support never is simple, but the logistic plans that utilize the basic standard support systems usually have the best chance for success. Mission-oriented logistic support concepts and standardized procedures reduce confusion. The operational commander must simplify the logistic task by communicating clear priorities, and forecasting needs based on current and accurate usage data.

Flexibility. *Adapting logistic support to changing conditions.* Logistics must be flexible enough to support changing missions, evolving concepts of operations, and the dynamic situations that characterize naval operations. A thorough understanding of the commander's intent enables logistic planners to support the fluid requirements of naval operations. In striving for flexibility, the logistic commander considers such factors as alternative planning, anticipation, the use of reserve assets, and redundancy. The task-organization of combat service support units is an example of flexible tailoring of logistic support resources to meet anticipated operational requirements.

Economy. *Employing logistic support assets effectively.* Accomplishing the mission requires the economical use of logistic support resources. Logistic assets are allocated on the basis of availability and

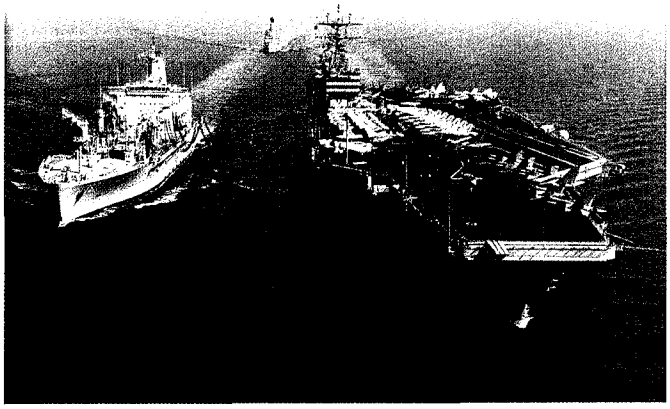
the commander's objectives. Effective employment further requires the operational commander to decide which resources must be committed immediately and which should be kept in reserve. Additionally, the commander may need to allocate limited resources to support conflicting and multiple requirements. Prudent use of limited logistic resources ensures that support is available where and when it is most needed. Without economy, operational flexibility becomes compromised.

Attainability. *Acquiring the minimum essential logistic support to begin combat operations.* Risk is defined as the difference between the commander's desired level of support and the absolute minimum needed to satisfy mission requirements. The commander must determine the minimum essential requirements and ensure that adequate logistic support levels have been attained before initiating combat operations. In some cases time will permit building up support levels beyond minimum essential requirements. During Operation Desert Shield, for example, the coalition retained the operational initiative and delayed the commencement of combat operations until a six-month supply of materiel was in theater and available to the operating forces. In this case, the commander was able to attain the level needed to satisfy mission requirements.

Sustainability. *Providing logistic support for the duration of the operation.* Sustaining the logistic needs of committed forces in a campaign of uncertain duration is the greatest challenge to the logistician. Every means must be taken to maintain minimum essential materiel levels at all times. This requires effective support planning that incorporates economy, responsiveness, and flexibility. Sustainability also is influenced by our ability to maintain and protect the ships and aircraft that move materiel to and from the operational theater.

Survivability. *Ensuring that the logistic infrastructure prevails in spite of degradation and damage.* Logistic support units and installations, lines of communications, transportation nodes, and industrial centers are high-value targets that must be protected by both active and passive measures. For example—since we may not always have the luxury of conducting replenishment in protected rearward areas—

survivability of our at-sea replenishment ships is an important factor in maintaining logistic flow. Dispersion of installations and materiel is another element of a logistic defense plan. Easier management of resources might favor centralized logistic locations, but the *survivability* of logistic support may require decentralized locations. The dispersion of reserve stocks, development of alternative sources of supply, and phasing of logistic support all contribute to survivability. Alternative logistic sites and transportation networks should be considered. Continued survivability also requires that logistic operations not be dependent on a single source or mode of support. The use of advanced support bases, other Services, multinational, and host nation support also should be considered as a means of enhancing the survivability of naval forces. In addition, we must be prepared to restore vital logistic nodes that suffer battle damage. Such preparation requires our ability to decontaminate, reconstruct, or relocate key elements of the logistic infrastructure.



Logistic principles seldom have equal influence; usually, only one or two dominate in a specific situation. At times, the principles may seem to make conflicting demands, depending on the situation. For example, a need for absolute responsiveness may require actions that are not economical. As such conflicts illustrate, the principles of logistics are meant as a guide for planning support operations, not a checklist. Identifying the principles that must take priority in a specific scenario is crucial, and influences the development of our support plan.

THE PRINCIPLES OF LOGISTICS

The Seoul-Inchon Operation

The amphibious assault by United Nations forces at Inchon during the first months of the Korean War provides a classic example of observing the principles of naval logistics for success in combat.

On 25 June 1950, armor and infantry units of the Democratic People's Republic of (North) Korea invaded the Republic of (South) Korea and within a month had driven not only South Korean but newly deployed U.S. ground forces into the southeastern corner of the peninsula around the port of Pusan. General of the Army Douglas MacArthur, who served as U.S. Commander-in-Chief, Far East, and Commander-in-Chief, United Nations Command, directed General Walton Walker to hold at Pusan with the 8th Army. Understanding the relationship between war and logistics, MacArthur also decided to execute an amphibious landing at the port of Inchon, to be followed by the recapture of the nearby South Korean capital of Seoul. MacArthur recognized the North Korean vulnerability, created by their lack of consideration for the logistic principle of **survivability**, and sought to exploit it. He reasoned, that by cutting the North Korean main supply and transportation arteries passing through Seoul, U.N. forces would be in position to cut off and destroy enemy forces or force their withdrawal from South Korea.

MacArthur, however, had only limited combat and logistic resources to carry out his bold plan. To strengthen the U.S. economic picture and bolster our allies in Europe in the years before the Korean War, President Harry S. Truman had sharply reduced the personnel, ships, aircraft, and equipment of the U.S. armed forces. The principle of **economy** strongly influenced MacArthur's operational decisions. As he planned for the Inchon landing, codenamed Operation Chromite, he ensured that he met the needs of his forces fighting in the Pusan perimeter and elsewhere in the theater. For example, he pressed into service 30 tank landing ships (LST) manned by Japanese civilians and operated by a U.S. occupation agency in Japan. MacArthur, a veteran of many successful World War II operations, concluded that his logistic plan was **attainable**–that his forces would have the minimum essential logistic resources to launch the assault at Inchon.

Because of the Navy's inherent **flexibility** and mobility, the ships of the Military Sea Transportation Service (now Military Sealift Command) and fleet transports embarked Marine, Army, and Air Force reinforcements in the United States and Europe and delivered them expeditiously to the combat theater. MacArthur had the option of deploying these troops to staging areas in Japan, plugging them into the front lines at Pusan, or

putting them ashore at Inchon. MacArthur and Rear Admiral James H. Doyle, Commander Amphibious Group 1 and the Navy's chief planner for Operation Chromite, kept their logistic concept of operations **simple**. The Navy's logistic forces were expected to provide primary support for the forces ashore and to **sustain** a high tempo of operations until the 8th Army linked up with the Inchon-beachhead forces.

The aircraft carriers, cruisers, destroyers, submarines, and shore-based air units of Admiral C. Turner Joy's Naval Forces, Far East Command, were close at hand to ensure the **survivability** of the troop transports, amphibious landing ships and craft, and logistic support vessels of Vice Admiral Arthur D. Struble's Joint Task Force 7, as these units deployed into the Yellow Sea on 13 and 14 September. The American warships, along with British, Australian, New Zealand, Dutch, French, and South Korean combatants, guarded against the limited threat posed by North Korean air and naval units. The U.N. fleet also was prepared for a greater danger—intervention by Soviet or Chinese Communist forces.

In a stellar example of **responsiveness,** the logistic forces of Struble's task force arrived off the landing beaches at Inchon on 15 September, D-Day, fully prepared to accomplish their mission. Transports disembarked the troops of the 1st Marine Division into landing craft and tank landing ships, which headed for the designated assault beaches. Oilers and an ammunition ship stood by to replenish forces afloat and ashore. In one of the most critical preplanned actions taken at Inchon, naval leaders beached eight LSTs, each loaded with 500 tons of food, water, ammunition, fuel, and vehicles. These materials were of vital importance to the Marines expected to hold precarious positions overnight before the next morning's tide brought in more troops and supplies. Soon after the Marines secured their beachheads, Navy Seabees moved in and erected a pontoon dock. By mid-morning on D+1, the men of Naval Beach Group 1 and a Marine Shore Party battalion also had landed and unloaded 4,000 tons of cargo from the LSTs, several of which had suffered damage from enemy weapons. These ships were replaced quickly by another nine fully loaded ships. Over the next several days, Navy transports brought in more U.S. Marines, South Korean Marines, and U.S. Army infantrymen. By the 19th of September, 1st Marine Division forces had captured the city of Inchon and Kimpo Air Base, from which Air Force air transports soon operated. Meanwhile, Army troops broke out of the Pusan perimeter. They linked up with their fellow soldiers south of Inchon on the 27th. Seoul fell to U.N. forces the following day. By the end of the month, only an exhausted and demoralized remnant of the once-mighty Communist invading army had survived the hasty retreat into North Korea. U.S. Naval logistic forces could take much of the credit for the stunning U.N. victory at Inchon.

Functional Areas of Naval Logistics

The most successful plans consider the application of each logistic principle across the six broad functional areas of logistic support. The products of these six functional areas, when combined and balanced, produce and deliver effective logistic support to our operating forces:

- Supply
- Transportation
- Health Services
- Maintenance
- Engineering
- Other Services

Supply. *Receive, store, issue, and resupply materiel for conducting naval operations.* The supply function includes design, procurement, contracting, receipt, storage, inventory control, and issuance of end items, repairables and consumable materiel, and eventual retrograde or disposal. The supply system equips and sustains our operating forces from predeployment through combat operations and subsequent redeployment. The needs of the supported naval forces drive all supply efforts. To help manage these many needs, supplies in the Defense Supply System are divided into ten classes.[5] Our supply system is organized to be flexible and responsive to the commander's support requirements.

Maintenance. *Those actions necessary to preserve, repair, and ensure continued operation and effectiveness of weapon systems (e.g., ships and aircraft) and components.* It includes the policy, organization, and issues related to the maintenance of equipment, afloat and ashore; development of maintenance strategies; standards of performance for both preventive

[5] The Defense Supply System, containing several million different items, includes the individual Service Supply Systems. These items are grouped into the following classes of supply recognized in joint operations and as defined in Fleet Marine Force Manual FMFM 4, Combat Service Support Manual and Army Field Manual FM 101-5-1, Operations, Terms, and Symbols. The classes are: I - subsistence; II - clothing, individual equipment, tools, administrative supplies; III - petroleum, oils, lubricants; IV - construction materiel; V - ammunition; VI - personal demand items; VII - major end items: racks, pylons, tracked vehicles, etc.; VIII - medical materiel; IX - repair parts; X - materiel for nonmilitary programs.

and corrective maintenance; technical engineering support; and battle-damage repair. The collection and analysis of materiel maintenance data supports the procurement and acquisition processes. The levels of maintenance—organizational, intermediate and depot—are discussed later in this chapter (Sustainment).

Transportation. *The movement of units, personnel, equipment, and supplies from the point of origin to the final destination.* Transportation involves deploying and sustaining forces within the continental United States to ports of embarkation, movement from those U.S. embarkation ports to the operational theater (intertheater strategic movement), and movement within the theater (intratheater movement). At aerial and sea ports of debarkation, other responsibilities of transportation support include offload, operational control of the ports, and management of the throughput. The theater reception and intratheater movement of personnel and equipment, medical evacuation, and retrograde of materiel are also part of the transportation function.

Engineering. *Provide the construction, damage repair, combat engineering, and maintenance of facilities.* Specialized units or technically trained personnel provide combat and civil engineering support to the commander. The supported commander's priorities and allocations dictate the supporting engineer's actions. Marine division engineers provide combat engineer support by carrying out missions related to mobility, countermobility, and survivability in forward areas. This includes breaching and emplacing obstacles, maintaining lines of communications, and constructing forward arming and refueling points. Marine combat service support engineers also provide general engineering support in the form of construction, water purification, and bulk fuel support. Naval Construction Force units complement Marine air-ground task force engineer capabilities by upgrading roadway systems, developing aviation support facilities, and erecting combat zone hospitals. Naval Construction Force units provide the additional capabilities of well drilling, and construction and repair of expeditionary piers and ports. Civil engineers plan, contract, construct, maintain and repair shore facilities, manage environmental matters, construct deployable medical facilities, store and distribute water and fuel, generate power, provide public works, and maintain utilities.

Health Services. *Support the health of the military force.* Health services are designed to preserve, promote, and improve the health of naval personnel, as well as their families. Health services provide medical and dental materiel, blood and blood products, and facilities and services in both combat and non-combat environments. Services such as medical and dental support may be an integral element of a shipboard medical department's sick bay, a mobile shore-based facility (e.g., a battalion aid station), or a fixed outpatient and inpatient facility. Health services include providing emergency and routine health care to all personnel; advising commanders on the state of health, sanitation and medical readiness of deploying forces on a continual basis; maintaining health and dental records; keeping a current mass casualty plan; training personnel in basic and advanced first aid; maintaining medical intelligence information files; implementing preventive-medicine measures; and ensuring combat readiness of health-care personnel assigned to various wartime platforms through continuous training. Health services also provide routine and contingency medical and surgical augmentation to selected ships through Fleet Surgical, Medical Mobilization Augmentation Response, and Medical Augmentation Program Teams. Naval health services include contingency facilities such as hospital ships and fleet hospitals, and the Marine Corps medical and dental battalions. Health service logistics provide medical and dental materiel (class VIIIA) and blood and blood products (class VIIIB).



Other Services. *Provide administrative and personnel support to keep combatant forces fully operational.* This function includes all aspects of personnel support, quality of life, and morale issues that are essential to sustained combat effectiveness. A direct relationship exists between adequate, well-orchestrated services and high morale and combat effectiveness of our forces. The function contributes to operational readiness through direct personal support. Other services include:

- ***Administration***. Maintains personnel records and documents, pay entitlements, promotions, and personnel movement and assignment status.
- ***Billeting***. Provides short- and long-term housing for military and associated civilian support personnel.
- ***Disbursing***. Pays naval force obligations, including personnel and logistic support.
- ***Exchange Services***. Provides goods and services at a savings to military personnel and their families. Afloat ships' stores provide personal necessities as well as laundry, dry cleaning and barber facilities.
- ***Food Services***. Furnishes meals for naval personnel.
- ***Legal Services***. Provides legal assistance as necessary.



- *Morale, Welfare and Recreation*. Offers recreational, sports, community, youth, and child-development programs, as well as cultural opportunities.
- *Mortuary Services*. Searches for, recovers and identifies deceased personnel and provides final disposition of their remains and personal property.
- *Postal Services*. Provides mail services for naval forces.
- *Religious Services*. Enables exercise of religion and accommodation of many faiths and practices. Religious-program personnel are stationed both ashore and afloat to support the gamut of naval operations.

Logistics is much more than the amalgamation of its functional areas. Although all six areas must exist to enable a ship, battalion or other unit to perform its assigned missions successfully, each area must be properly combined and integrated into the command's planning and operations to provide the needed flexibility and adaptability.

Elements of the Logistic Process

Within each of the functional areas, four elements of the logistic process—acquisition, distribution, sustainment, and disposition—play important roles in recasting our national resources into the products and services we need to support our operational readiness. As illustrated in Figure 2-2, **acquisition** of weapons and support systems, end items, commodities, facilities, and ordnance is the process that provides new or improved logistic support over the long term, through formal planning, programming, and budgeting; **distribution** is the process in which logistic support is allocated and delivered to maximize combat effectiveness; through **sustainment** we ensure adequate logistic support to permit continuous operations without interruption; and **disposition** is the process that provides for the return of excess or not fully capable materiel for repair, redistribution, or salvage. These individual processes, operating in each functional area, constitute our overall logistic process.

Elements of the Logistic Process

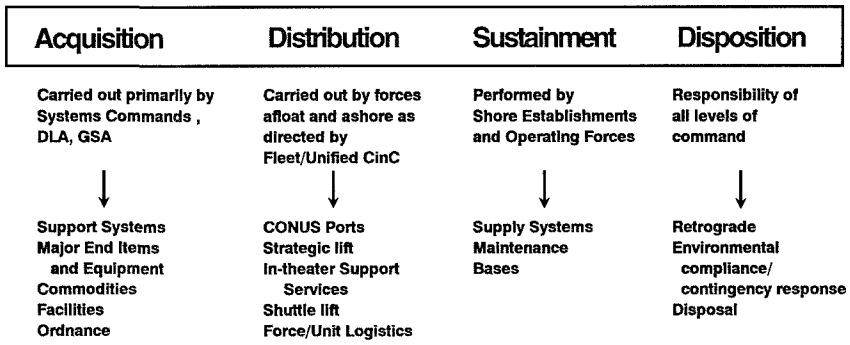


FIGURE 2-2

Acquisition. Our investment in logistic support resources and services provides the basic building blocks of operational readiness and sustainability. Our principal acquisition organizations are the Systems Commands for both the Navy and Marine Corps (Naval Sea Systems Command, Naval Air Systems Command, Space and Naval Warfare Systems Command, Marine Corps Systems Command, and the Naval Supply Systems Command), the Defense Logistics Agency, the General Services Administration, the Naval Facilities Engineering Command, the Marine Corps Logistics Bases Command, and the Naval Medical Logistics Command.[6] These organizations are responsible for procuring, producing, or constructing *commodities*: food, clothing, petroleum, oils, and lubricants, repair parts, and consumable medical support items; *facilities*: real property, buildings, piers, and wharfs; *ordnance*: missiles, mines, torpedoes, ammunition and explosives; and *major weapon systems and end items* such as ships, aircraft, and electronic systems. In addition, the Systems Commands are

[6] The Defense Logistics Agency controls the Defense National Stockpile Center, the Defense Reutilization and Marketing Service, and a network of other major supply centers, depots, specialized support points, and regional contract administrative offices that acquire, store, issue, dispose of and manage common materiel for all Services. The General Services Administration provides management functions for common consumable materiel and non-tactical automation systems.

responsible for life-cycle management, a significant and comprehensive systems support program known as Integrated Logistic Support.[7]

The Integrated Logistic Support program is a composite of all the support considerations necessary to ensure the effective and economical support of our weapon systems. Integrated Logistic Support starts in the concept phase and continues throughout the entire life cycle of the weapon system, ensuring a disciplined, unified, and systematic approach to acquisition logistic management.

Acquisition of operational support systems includes the research, development, procurement and production of Combat Logistics Force and other Service Force ships; naval airlift, cargo and tanker aircraft; strategic sealift ships; related logistic delivery system equipment; and Advanced Base Functional Components.[8]

Distribution. The methods used to get logistic support in the form of materiel, support services, and personnel to the operational commander depend upon what is being moved, its origin and destination, the lift assets available, and the urgency assigned. We select the mode of transporting logistic support based largely on the weight, size, and urgency of need. As recently as Operations Desert Shield and Desert Storm, approximately 90% of the materiel transported to the operational theater was by sealift; nevertheless, airlift continues to be important (especially in combination with prepositioned assets) because it provides a rapid response to urgent materiel and personnel needs. The logistic element of distribution includes organizations such as the Defense Logistics Agency–the Department of Defense's principal distributor for materiel stored in and shipped worldwide from key

[7] Integrated Logistic Support includes technical data; supply support; facilities; personnel; packaging, handling, storage, and transportability; training and training support; support equipment; computer-resources support; maintenance planning; and design interface. Related disciplines supporting the Integrated Logistic Support process include the computer aided logistic support system–Continuous Acquisition and Life-cycle Support; acquisition and logistic funding; configuration management; post-production support; ammunition; warranties; standardization; and logistic support analysis.

[8] Advanced Base Functional Components are discussed further in Chapter Four.

distribution depots—and the management and operation of ports in the continental United States, strategic lift, in-theater support services, intratheater shuttle lift, and individual unit or force-wide logistic movement.

Continental U.S. Ports. Most of our equipment, systems, and logistic support resources destined for deploying or deployed operating forces on air and sealift assets transit through continental U.S. ports. These ports are used by all Services and, as such, require standardized and coordinated planning and management.

Strategic Lift. Global common-user land, sea, and air transportation of systems, equipment, and logistic support resources are managed under a single unified command, the U.S. Transportation Command. Actual lift resources are a combination of government owned, controlled, or managed assets of the three Service component commands. The Navy's principal resource contribution is strategic sealift, operated by the Military Sealift Command.[9] Sealift provides the preponderance of all joint strategic lift capacity. Most resupply flows by strategic sealift to forces ashore and afloat, but high-priority cargo, mail, and passengers are transported most often by strategic airlift, a primary responsibility of the Air Force, through the Air Mobility Command. Ground transportation by truck and rail within the continental United States is managed by the third leg of the U.S. Transportation Command—the Military Traffic Management Command, a responsibility of the Army. The Military Traffic Management Command also operates most continental U.S. military ocean terminals and some selected overseas ports.

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[9] The Military Sealift Command operates Maritime Prepositioning Ships organized into squadrons around the world, other prepositioning ships containing Army, Air Force, Defense Logistics Agency, and Navy equipment and supplies; fast sealift ships; dry-cargo ships; general purpose oil tankers; hospital ships, aviation logistic support ships supporting deployed Marine Aircraft Wings; Naval Fleet Auxiliary Force ships; and Special Mission Support Force ships (e.g., cable-laying, survey, etc.) In time of war or national emergency, the Military Sealift Command also would require activation of Ready Reserve Force ships and "as attrition fillers" ships in the National Defense Reserve Fleet that are maintained in a peacetime inactive or reduced operating status by the Maritime Administration.

In-theater Support Services. Maintenance and distribution support requirements for forward-based afloat or ashore naval units in the theater of operations include cargo handling, warehousing, repair ships, floating drydocks, towing and salvage, repair-parts stockage and distribution, and personnel and health services. This support may be provided in port and ashore, on specifically configured strategic sealift ships, or Combat Logistics Force ships that operate primarily with battle groups. (also called "station" ships.)

Shuttle Lift. Intertheater as well as intratheater air and seaborne transportation of logistic support resources is provided by Combat Logistics Force ships and Air Force or naval organic airlift assets. Logistic support resources transported into the theater by strategic lift are generally redirected at in-theater support nodes—naval advanced logistic support sites or naval forward logistic sites—onto shuttle lift assets for onward movement or delivery.

Force/Unit Logistics. At the unit level, closely coordinated shuttle lift, in-theater support services and organic distribution assets complete the delivery of force requirements. At the tactical level, afloat naval forces are replenished by the Combat Logistics Force station ships. A ship's organic aircraft also transports passengers, mail, and cargo. Once deployed ashore, a Marine air-ground task force requires considerable tactical transportation support—both air and ground. This transportation is typically provided by organic elements, other Services, and the host nation.

Transportation capability easily can become the focus of distribution, but that is only one aspect. Distribution involves overall management, inventory control, and the integration of logistic information support. State-of-the-art advances in information management techniques and applications such as "in-transit visibility"—the computer-assisted ability to track and locate materiel enroute—are enhancing distribution management and inventory control and providing improved effectiveness in both transportation and distribution.

Sustainment. When national leaders call upon naval forces in times of crisis, they look for both responsiveness and staying power. Forward deployed naval forces carry with them initial sustainment stocks to support operations and they are supported by an in-place, efficient, functioning logistic system constantly flowing materiel and logistic support that needs only to expand its flow to accommodate increases in operating tempo and the assimilation of additional forces. Consequently, an early action taken in crisis response is prompt reinforcement of the naval task force's logistic support pipeline. Continuous logistic support by that pipeline is particularly critical during the initial stages of a crisis, to support potential long-term operations. Proper sustainment capability allows our naval forces to remain on station as long as needed. Establishing and maintaining this reliable flow of materiel, resources, and support services to our operating forces is accomplished through the operation and management of supply systems, naval maintenance assets, and bases.



Supply Systems. The mission of supply organizations is to provide for the peacetime and wartime operational materiel and service needs of our forces in a timely manner. Activities include cataloging, stocking, controlling inventory, and managing and disposing of replenishment supplies. In an effort to centralize materiel

management, many of these activities are provided by the Defense Logistics Agency, which supports all Services. At the Service level, the Naval Supply Systems Command conducts overall supply system management through inventory control points and Fleet and Industrial Supply Centers. The Naval Supply Systems Command is the program manager for such areas as food service, fuel management, materiel resale, and printing. The Marine Corps Logistics Bases Command supports the Fleet Marine Forces by providing a full range of logistic support (less medical materiel–class VIII) including depot-level maintenance, storage, and distribution of Marine Corps equipment and supplies. The Naval Medical Logistics Command provides and coordinates health service materiel management and logistic support to the operating forces, contributing to operational readiness by making available necessary resources to maintain and restore healthy naval forces.

Maintenance. Naval maintenance philosophy employs a capability-tiered structure, with organizational, intermediate, and depot levels of repair, depending on the technology employed and complexity of the weapon systems involved. At any level, maintenance can be either corrective or preventive. The frequency and extent of planned maintenance performed by fleet units and by naval or contractor-operated depots and shipyards on major end items or weapon systems is established by the Integrated Logistic Support[10] process during that system's or item's acquisition phase.

- *Organizational-level maintenance* consists of unit-level inspections, servicing, adjusting, repair, and assembly–generally conducted without outside assistance.

- *Intermediate-level maintenance* is conducted in afloat units such as tenders and our larger combatant ships, and ashore by specialized elements of the Marine air-ground task force and fleet and contractor-supported facilities. The goal of intermediate-level maintenance is to

[10] Two key products of the Integrated Logistic Support program are the Coordinated Shipboard Allowance List (COSAL) and Aviation Coordinated Allowance List (AVCAL). These documents, developed by the Navy inventory control points, serve to authorize and direct the applicable levels of spares and repair parts to be maintained by naval operating forces for equipment systems on board ships and aircraft.

have a repair capability responsive to the needs of naval units, in any location, with specialized facilities, tools, equipment, parts, and trained personnel. The concept of battle force intermediate maintenance activity is discussed in Chapter Four.

● *Depot-level maintenance* is provided by shipyards, ship-repair facilities, aviation depots, in-service engineering centers, naval warfare centers, weapons stations, Marine Corps multi-commodity maintenance centers, and civilian contractors where major industrial facilities and equipment are available. Commercial facilities are used to supplement military-owned facilities. This capability focuses on overhaul, rebuild, and unique calibration of principal end items and major repairables.

All levels of maintenance–the depot level, in particular–represent a wartime source of skilled artisans, capable of being organized into mobile battle-damage-repair teams who, along with other maintenance personnel, ensure vital equipment readiness.

Bases. The operation and maintenance of bases, stations, and facilities in the continental United States and overseas provide the foundation for support of our operating forces. In addition, we construct expeditionary bases and strengthen existing bases and logistic nodes with appropriate combinations of naval engineers and contracted capabilities, wherever conditions in the theater are austere and infrastructure is scarce. The contracted capability of major U.S.-based, internationally operating engineering and construction firms is an enormous asset; frequently it is brought to bear where there are no hostilities or where logistic nodes are located to the rear of the battle or otherwise out of enemy striking range. Many support services–such as major health services, engineering support, and training facilities–originate from bases, which also provide maintenance, repair, and supply services. Safety and environmental policies and practices are critical factors in base maintenance, as are the planning and construction of roads, bridges, and facilities necessary to keep the bases in operation. Temporary logistic support sites channel these services to forward deployed forces as required.

Sustainment issues also include ensuring that backup sources of vital materiel are available and recognizing the risks in relying upon limited means of delivery of various forms of logistic support. Other concerns range from replenishing the stocks of materiel that have limited useful life to maintaining an orderly personnel turnover.

Disposition. The handling, stowage, retrograde, and disposal of materiel and resources is a logistic consideration at all levels—strategic, operational, and tactical. Disposition is a matter of fiscal and environmental responsibility, as well as a matter of security when dealing with classified materiel. It is a significant contributor to our ability to sustain our forces over the long term. The Defense Reutilization and Marketing Service, controlled by the Defense Logistics Agency, is an integral component of disposition. It fulfills a significant role by providing worldwide support to the Services. Additionally, it has responsibility for the proper disposition of environmentally hazardous materials for the Services.

A primary consideration is adherence to environmental-protection laws, local through international. Avoiding adverse environmental impact requires responsible and conscientious action at all levels. Noise, air, and water pollution, waste disposal, hazardous-materiel stowage, and disposal of shipboard hazardous waste are only a few of the areas of concern. Such considerations impact our day-to-day operations, the way we use training areas during exercises, and even our peacetime conduct in the ports we visit around the world.

Naval responsiveness and attention to environmental considerations have prepared us with an inventory of specialized systems, equipment, materiel, trained personnel, and a capability to react to, or assist other agencies in, environmental contingencies. Through the Navy Supervisor of Salvage, the Navy has prepared worldwide contingency plans for response to Navy spills of oil or hazardous materials and has prepositioned equipment throughout the world to respond to these contingencies. This Navy-owned oil spill response inventory is one of the largest in existence and has deployed to every major U.S. oil spill in the last two decades. The Coast Guard is the primary Service responsible for oil-pollution

response. When working closely with equipment and manpower provided by the Navy Supervisor of Salvage, the Navy/Coast Guard team has demonstrated its capability and expertise through assistance to clean up efforts ranging from major oil spills and accidental releases to the malicious acts of environmental terrorism perpetrated by Iraq during the Persian Gulf War of 1991.

The process of disposition begins with the first piece of equipment or major end item that must be removed from the operating theater for repair, replacement, or as excess for further distribution. During war or major peacetime operations, it may be necessary for some major items to return to theater after retrograde and refurbishment. Retrograde, the process of removing materiel and personnel from theater, is a coordinated operation involving lift assets and specialized salvage capability that may be necessary for large items such as ships and aircraft. At the conclusion of conflict or of other major operations, naval forces are likely to be the last to leave the region. Assigned units organize and prepare to return materiel, or dispose of it properly.

Principles, functional areas, and elements of the logistic process are the building blocks upon which we plan and organize logistic forces and support. Logistic principles provide the framework for arranging logistic support, in order to enhance the commander's probability of success—even in the presence of unforeseen difficulties. The principles, functional areas and elements of the logistic process are interrelated and must be considered corporately in planning the logistic support component of naval operations.

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CHAPTER THREE

Naval Logistic Planning and Information Support

"A sound logistic plan is the foundation upon which a war operation should be based. If the necessary minimum of logistic support cannot be given to the combatant forces involved, the operation may fail, or at best be only partially successful."

— Admiral Raymond A. Spruance, USN,
Commander Fifth Fleet, 1946

The dynamic process of providing logistic support to our operational forces is one characterized by the need to respond to continuous change: e.g., changes in support required because actual usage exceeds expected consumption; changes in user location to keep ahead of enemy moves; changes in quantities needed to replace losses in transit or at the theater depot. A responsive logistic planning system and integral information support allow naval logistics to keep up with these necessary changes to maintain our operational warfighting readiness through uninterrupted logistic support.

Naval logistic planning and information support is designed to answer these questions: What materials, facilities, and services are needed? Who is responsible for providing them? How, when, and where will they be provided? To find answers, we start with sources of logistic planning guidance, then apply a formal process that parallels operational planning procedures. The nature of the situation will determine whether we apply a deliberate or a crisis action planning process. Using one of these processes, we formulate a general plan that covers the organization, procedures, and policies of logistic support groups and the specific directives or instructions detailing the execution of support for a particular operation. Naval logistic information support allows us to keep the plan current, accurate, and adequate by providing data on the status of logistic resources, operational force needs, and the ability to meet those needs. Logistic planning and information support are thus complementary. Information enables a commander to apply his experience and judgment to deviate from existing plans. Similarly, formal planning can organize and prioritize a commander's information needs, allowing him to select the best courses of action and adapt what he knows to the situation.

Logistic Planning

Logistics is the responsibility of the operational commander, who must ensure that his operations and logistic experts integrate their operation and logistic plans. Overall feasibility of these plans will be determined by their ability to generate and move forces and materiel into the theater, then forward to our operating forces.

The complexity of planning would be extremely daunting, but for the fact that both logistic and operations planning are organized processes. Logistic planning is performed in parallel with naval operations planning. Logistic planners identify and resolve support problems early by working concurrently with, and in support of operations planners. All planners must consider the overall support requirements and capabilities. This is accomplished by working back from established objectives, and addressing such issues as adequacy and availability of resources. The result of this process is a logistic concept of operations that parallels the commander's concept of

operations, permitting subsequent detailed, tactical-level, support planning. Detailed logistic planning should:

- Earmark significant time-phased support requirements
- Identify transportation requirements to support the movement of personnel, equipment, and supplies
- Outline the capabilities and limitations of ports, including the Logistics-Over-The-Shore[11] capability to respond to normal and expanded requirements
- Recognize support methods and procedures required to meet the needs of the sea, air, and land lines of communications
- Coordinate and control movement into the contingency area
- Develop reasonable logistical assumptions
- Define the extent of needed host nation resources
- Identify the engineering and construction requirements for sustainability
- Identify the source of funding for logistic support
- Consider the meteorologic and oceanographic limitations.

Sources of Logistic Planning Guidance

"Logistic considerations belong not only in the highest echelons of military planning during the process of preparation for war and for specific wartime operations, but may well become the controlling element with relation to timing and successful operation."

— Vice Admiral Oscar C. Badger, USN
Address to the Naval War College, 1954

[11] Logistics-Over-The-Shore (LOTS) operations. The loading and unloading of ships without the benefit of fixed port facilities, in friendly or non-defended territory, and, in time of war, during phases of theater development in which there is no opposition from the enemy. Joint Logistics-Over-The-Shore (JLOTS) operations are conducted by forces of two or more service components.

The National Security Strategy, National Military Strategy, Unified Command Plan, and the Joint Strategic Capabilities Plan all form the basis of the theater campaign plan, and, in turn, the logistic support plans. These broad documents—in particular, the Joint Strategic Capabilities Plan, which conveys the Chairman's guidance—contain the basic planning assumptions for developing regional plans. Navy and Marine Corps Capabilities and Mobilization Plans, and the Marine Corps Mobilization Management Plan contain detailed policies and force capabilities and allocation for each logistic functional area.

Logistic planning guidance establishes planning assumption boundaries, to make the intended logistic support both reasonable and tenable. This guidance applies to all categories of planning.

Deliberate and Crisis Action Planning. Logistic planning covers the full range of operations. Some likely contingencies will allow the relative luxury of time to employ deliberate planning; others will require crisis action planning to meet demands for quick response. Deliberate planning can take years; some crises may allow only hours. Although military flexibility requires a capability to conduct short-notice crisis planning when necessary, our nation's military strength is enhanced by deliberate peacetime analysis, planning, and exercises. Deliberate planning and crisis action planning often occur concurrently.

Both types of planning use a similar process, to move the right blend of combat and support forces, equipment and supplies into a theater of operations, on time.

The Logistic Planning Process.

> *"A real knowledge of supply and movement factors must be the basis of every leader's plan; only then can he know how and when to take risks with those factors, and battles are won by taking risks."*
>
> — Napoleon, ca. 1805

Command carries the responsibility to move, support, protect, and coordinate assigned forces to accomplish the mission. The planning process that assists in carrying out these duties includes the commander's estimate of the situation, the commander's plan, the commander's directive, and the execution (including supervision) of the plan. Figure 3-1 illustrates the parallel nature of logistic planning in concert with operational planning. No single precise planning formula will work in every case, but the basic building blocks in this standard planning process allow the commander to issue his directives in a clear, familiar format while preparing to carry out the mission.[12]

Naval Logistic Planning

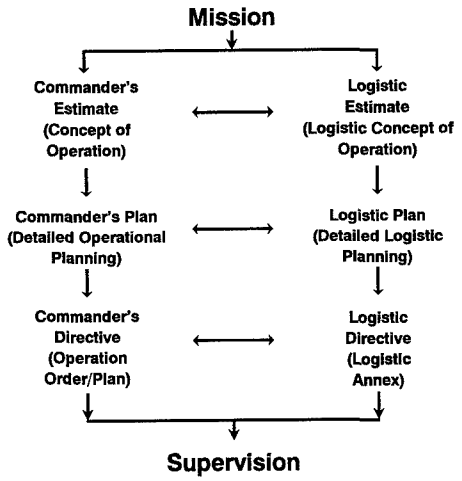


FIGURE 3-1

Commander's Estimate/Logistic Estimate. Given a mission (which may include mission constraints), the commander's planning staff analyzes the situation, developing and proposing several feasible courses of action. The commander then selects from proposed possible courses of action the one he judges most likely to succeed. Using this course of action, the commander then develops a brief concept

[12] The naval planning process is discussed in depth in both Naval Doctrine Publication 5 Naval Planning and Naval Warfare Publication 11 Naval Operational Planning.

of operations which states, in broad terms: what is to be done; the size of the force needed; and the time frame. This concept of operations identifies the problems planners must address in positioning, sustaining, and defending the force. Accordingly, logistic planners must:

- Understand the mission and the commander's intent
- Identify the means necessary to accomplish the mission (resource requirements in terms of forces, capabilities, sustainment, and lift)
- Know the time available for both planning and executing the mission
- Identify the order in which forces and materiel are needed
- Identify and adjust for shortfalls
- Assess risks, based on the difference between desired and attainable amounts of support.

The logistic estimate and concept of operations are prepared concurrently with the commander's estimate and concept of operations. In many cases, logistic limitations and plans will become a deciding factor (even the focus of effort) in the commander's plan. The logistic estimate tells the commander which operational course of action is most supportable from a logistic standpoint, and lists the measures needed to overcome logistic problems or factors limiting support for each course of action. Together with estimates prepared by other staff divisions, the logistic estimate provides key conclusions and recommendations to assist the commander.

Using data from the logistic estimate and information pertaining to the commander's selected course of action, the planners develop the logistic concept of operations concurrently with the commander's concept of operations. Just as the commander's concept of operations outlines a broad course of action to accomplish the mission, the logistic concept of operations outlines a broad plan of support. The commander's intent, concept of operations, and other command priorities drive the logistic concept of operations,

which also includes the division of effort among the operational components. The logistic concept also establishes the Joint Force Commander's responsibilities, as well as those of the Service components.

Commander's Plan/Logistic Plan. During the planning phase of this process, the commander develops a detailed plan for accomplishing the selected course of action. The logistic plan is developed concurrently with, and as a part of, the operation plan to describe in detail associated logistic tasks. The Joint Operation Planning and Execution System encompasses both deliberate and crisis action planning and is used to monitor, plan and execute mobilization, deployment, employment, and sustainment activities associated with joint operations. With this system, planners can assess quickly the feasibility of their plans in terms of resources and transportation considerations.

In deliberate planning, theater commanders and their staffs transform planning requirements into a family of operation plans to meet requirements in the theater. The plan-development phase includes both the operational and logistic plans and directives. From a logistic planning perspective, the most difficult task occurs during the plan-development phase of deliberate planning, when support requirements are determined and time-phased deployment schedules are developed. Logistic planners must determine the quantities of sustainment (supplies, equipment, and personnel) needed to support particular courses of action. The gross quantities are then converted into number of personnel, weight, square footage and volume, and then lift requirements are calculated and phased into the deployment plan. The actual support calculations are based on consumption rates developed by the Services. These consumption rates vary with the class and subclass of supply, theater or area of operations, expected combat intensity levels, and projected duration of the operation.

The starting point for crisis action planning, on the other hand, may be an existing operation or concept plan. An operation plan may require updating, while a concept plan will require full development beyond the approved concept of operations. In many cases, however, the uniqueness of the crisis may require the timely

creation of a concept of operations, development of alternative courses of action, and development of force deployment schedules for each alternative. We may be forced to develop and evaluate logistic support plans concurrently with alternative courses of action using an iterative approach. Once a particular course of action is selected, we can finalize force, lift, and sustainment requirements. Here too, development of crisis action plans inherent in the Joint Operation Planning and Execution System relies heavily on its automated data processing capabilities.

Using the Joint Operation Planning and Execution System, planners can build an effective combat and support force package and calculate the logistic support and sustainment requirements. Normally, specific ships are not identified to support plans developed during the deliberate planning process, but typical or notional force packages are identified and unit characteristics are listed in the Joint Operation Planning and Execution System data base. During the crisis action planning process, specific ships and shore logistic support sites are identified for the particular operation and their capabilities are compared to the Joint Operation Planning and Execution System data.

Operational Directives/Logistic Annex. During the directive phase, the commander communicates his planned organization and tasks to his subordinates through operation plans (in deliberate planning) or operation orders (in crisis action planning). Within these plans or orders the commander expresses the end state he desires by way of the commander's intent. Generally, the logistic plan is placed in an annex to operational directives with amplifying appendices for each logistic functional area. In the logistic plan, tasks are assigned to particular elements of the force. These taskings include establishing and maintaining the logistic pipeline—from identifying lines of communications and setting up advance bases and facilities, to managing in-theater distribution of supplies, setting priorities for intratheater transportation, medical evacuation, the use of host nation and contractor support, the disposition of captured materiel, the purchase of regional resources, and container management in the objective area.

Supervision of the Plan. During the execution phase, the commander monitors the operation to see if it is accomplishing the mission, and whether he needs to revise his directives. Such evaluation is essential to our logistic system's ability to anticipate and respond to changes. Commanders at each level of the chain of command must be ready to modify existing support plans whenever necessary. With every change, we refine the logistic plan.

Strategic-level logistic refinement is conducted primarily by the Service logistic sourcing agencies, the Defense Logistics Agency, and the Service components of the unified commands. The purpose of refinement is to confirm the sourcing of logistic support and to assess the adequacy of the resources to support the planned operation. It allows us to resolve resource shortfalls (forces, materiel, or lift) as well as problems regarding non-unit personnel and cargo movement, materiel retrograde, medical evacuation, and materiel resupply. Refinement conducted at this level eventually affects all levels.

Logistic Planning Considerations. Throughout the planning process several important considerations influence the feasibility of our logistic options and the strategies from which we may choose. Issues such as the availability of strategic lift assets; joint, interagency, international, and host nation support; and environmental concerns impact our courses of action and our ability to execute them.

Transportation Planning. This is perhaps our most important planning consideration. Phasing personnel, equipment and supplies into the theater ensures that terminals and ports of entry are not glutted—but more important, phasing ensures that the right combinations of combat-ready units arrive on time with proper logistic support. The enormous amount of cargo and people that must be moved to any theater of war, the time constraints, and the many ways of moving logistic support require that logistic planners organize and prioritize the employment of strategic lift assets. There never is enough strategic lift to move everything simultaneously.

Initial decisions regarding power projection—especially the type and number of forces—are decisive in determining the character of an operation. If we initially deploy an abundance of combat power with inadequate logistical support, this may not only hinder the long-term logistical support of the operation, but also the success of the operation itself. At the other extreme, if we decide to inject an early logistical buildup, we may place materiels at risk and find ourselves struggling to build up our combat power with the remaining lift. These decisions normally are among the first to be made. Because there is limited strategic lift, the essential tradeoff is between projecting combat forces rapidly and projecting the right mix of combat power and logistical resources to accomplish the mission. The selection of the earliest arriving units—whether they are combat or combat service support—will have broad implications.

If the right units deploy early—properly balanced between combat and combat service support—they will allow the force to respond to unforeseen events. In areas with substantial infrastructure, the commander may weight his force more heavily with combat units. When we enter an austere theater, combat service support units will be needed early in the flow to facilitate the reception and onward movement of forces. This will reduce the number of combat units and potential combat power arriving early in theater. These decisions are most difficult when combat has not yet begun, and the enemy can provide effective low-grade opposition or attack suddenly. The commander must seek a balance that provides effective initial combat power and critical logistic support to respond to a variety of situations.

In formulating the transportation aspects of the plan, lift requirements are defined as forces and cargo that must be moved, their origins and destinations, and their required delivery dates. The goal of this planning segment is to provide the theater commander the support he needs using the fewest possible support personnel and the minimum support infrastructure. Running computer simulations that compare requirements and capabilities produces time-phased force and deployment data that assist planners in the task of managing deployment resources. If these simulations show transportation

shortfalls, planners can devise ways to eliminate bottlenecks or redesign the plan to fit the constraints. Transportation sequences that function properly in simulation are designated as "transportation feasible," and considered "effective for planning." The time-phased force and deployment data also helps to provide flexibility to planning, allowing transportation "packages" to be rapidly developed or modified in crisis situations.

Joint, Interagency, Multinational, and Host Nation Support. The reality of a changing and politically complex world affects our operational planning and the availability of joint-service, interagency, multinational and host nation support must be included in our logistic support considerations. Much of our operational and logistic planning involves full integration and participation in joint and multinational operations. Similarly, our planning must consider Department of Defense interservice agreements. For example, the Navy provides outfitting and logistic support to Coast Guard ships, aircraft, and facilities to ensure that the Coast Guard is prepared to carry out assigned naval warfare tasks while operating with the Navy.[13] Special aspects involving joint and multinational participation include:



[13] Additional details are contained in OPNAV Instruction 4000.79_, Policy for U.S. Navy Support of the U.S. Coast Guard.

- The capability to support or receive support from joint or multinational forces
- Assignment of logistic responsibilities and servicing arrangements by the Joint Force Commander
- The tactical and physical limitations of participating units from other Services and nations to receive and provide logistic support using naval systems
- Early contracting for foreign logistic support (including contractual and finance personnel) and other host nation support, to ensure access to the required host nation capabilities.

The emphasis on joint integration demands coordination among diverse functions and organizations. Procurement, transportation, supply, personnel, maintenance, health-services systems and information must be compatible to find, acquire, store, move, and track resources from one Service or location to another. For example, such organizations as the Defense Logistics Agency and General Services Administration support all Services and coordinate their activities with the transportation component commands of the U.S. Transportation Command—the Military Sealift Command, Military Traffic Management Command, and Air Mobility Command—in addition to host nation communication and transportation functions. The magnitude and complexity of major force deployment and resupply stretches each distribution element to its limit. Without interagency coordination, forces and logistic support will not arrive at their destination in adequate quantities or on schedule.

Environmental Planning Considerations. Environmental issues may be addressed during the development of a logistic support concept and plan. The law and the public require our continued adherence to the regulations protecting the world we live in. But our acceptance of this responsibility is not driven solely by legal concerns. Environmental issues affect the health, safety, and readiness of our forces. We readily address these issues in our peacetime day-to-day operations, but in contingencies these matters loom largest after the expeditionary operation is concluded and the retrograde

phase commences. Foresight and guidance in planning the operation can preclude unnecessary actions from being taken during the operation that impact the environment adversely, afloat or ashore.

Separate from how we impact the environment is the way the environment affects logistic planning. Meteorologic and oceanographic conditions affect logistic operations by influencing routes and arrival times of the supply tail, controlling movement of Logistics-Over-The-Shore operations, and even dictating the quantity of materiel required to complete the mission. Timely and accurate meteorologic and oceanographic information is essential and must be considered throughout the logistic planning process.

The bridge between planning and execution requires a system for direction and control. Logistic support information both undergirds our planning and becomes the bridge to execution of the logistic plan.

Logistic Information Support

"Gentlemen, the officer who doesn't know his communications and supply as well as his tactics is totally useless."

— General George S. Patton, USA

Providing logistic support is a process of resource prioritization, allocation, distribution, and management. Locating and moving logistic support in a way that gets the right materiel, personnel, and services to the right users on time requires reliable logistic information support. Such support provides vital data before, during, and after the planning process. It allows the commander to disseminate his logistic plan and enables him to coordinate and direct the distribution of logistic support during the plan's execution.

Interface with the Planning Process. Logistic support information systems are essential tools that assist the planner in:

- Translating plans and command decisions into the physical distribution of support resources
- Monitoring to ensure that the logistic system is responding to end-user requirements
- Informing the end user about the status of delivery.

Whatever the nature of the conflict or forces involved, logistic information will be a major factor. Logistic information support provides important planning data for such basic questions as: What do I have? What do I need? When will I get it? What will I do with it? The questions may appear simple, but the answers are spread among many dispersed areas of the logistic pipeline. This requires that planners have access to an integrated information network which will enable commanders and their staffs to plan, control and coordinate logistic support operations.

Logistic Command, Control, and Communications. Logistic information support assists the commander in aligning his logistic support systems with the structure and employment of his combat forces. This unity of effort is best obtained through a single command authority, exercising command and control over his combat forces and the support system that sustains them. Effective logistic command and control is characterized by:

- Timely and accurate receipt of requirements, expenditure information, and shipping status
- Accurate inventory visibility, including materiel in transit–Total Asset Visibility[14]
- Effective information management

[14] **Total Asset Visibility:** A system that provides information for both operational commanders and logistic managers on the location, quantity, condition, movement, and status of assets throughout the Department of Defense logistic system. In-transit Visibility, a subsystem of Total Asset Visibility, has the ability to track the identity, status, and location of Department of Defense unit and non-unit cargo (excluding bulk petroleum, oils, and lubricants) and passengers, medical patients, and personal property from origin to destination.

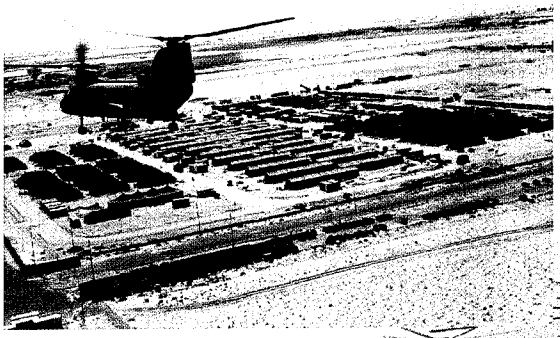
- Flexible support that allows the reroute of cargo based on operational need
- Accessibility to the support system data base
- Proper positioning with respect to transportation hubs and theater(s) of operation.

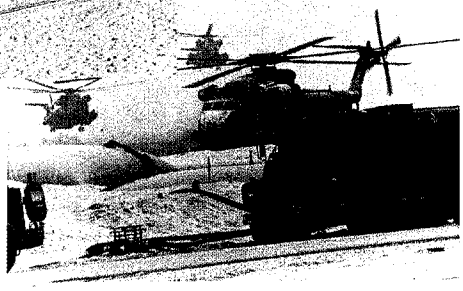
These characteristics require redundant and reliable communications that link users, providers, and commanders. Despite the apparent abundance of such modern communications technology as satellites, computers, and fiber-optic transmission, communications capacity is a limited resource. There always will be competition for communications, whether afloat or ashore. Therefore, communications for logistic support must be viewed as an operational requirement, not an administrative one. Logistic support connectivity is neither optional nor insignificant, in terms of its requirements for dedicated connectivity to update logistic requirements and resource availabilities.

Information Vulnerability and Security. New and evolving strategies and technology advances are improving our decision-making processes. These advances keep us prepared to perform wartime missions, as well as those that occur across the full range of power projection and forward presence missions. Such technologies as electronic mail and electronic data interchange, using readily available commercial communication links and global computer networks, are becoming a routine part of our logistic planning environment. The collective volume of unclassified, discrete pieces of logistic data can reveal the classified intent and objectives of the force. Logistic planners and operational forces must recognize the importance—as well as the vulnerability—of our logistic information and take the necessary steps to protect and back up these systems.

The aim of any military organization is to produce the most effective combat power with the resources available. Detailed naval logistic planning and accurate logistic information support form the bedrock of our naval combat power and force readiness.

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CHAPTER FOUR

Naval Logistics Operations

"Integrated support resources in the form of fleet-based sustainment assets and strategic assets provide naval expeditionary forces and joint and multinational forces the ability to operate in peacetime and in war wherever and whenever our national interests demand. Our ability to move and sustain forces at great distances from our shores is critical to the forward presence component of our military strategy."

— Naval Doctrine Publication 1, Naval Warfare

Readiness, flexibility, self-sustainability, and mobility are the qualities that permit naval forces to be expeditionary—able to establish and maintain a forward presence around the world. Effective logistics is essential for our naval forces to function in this expeditionary role conducting operations at sea and from the sea in support of the National Military Strategy.

The continuous flow of logistic support can be viewed in terms of pipelines that channel supply, engineering, transportation, maintenance, health, and other services from sources to end users. They also have the important capability of responsible disposal or return of excess materiel and inoperable items that are beyond the capacity of in-place repair facilities. At the entry, exit, and forwarding or intermediate staging nodes of the pipelines, are points where we obtain and feed back information while factoring in the considerations of the planning process. The concept of logistic pipelines oversimplifies a complex process, but it is useful in describing the flow of logistic support. Figure 4-1 illustrates this flow.

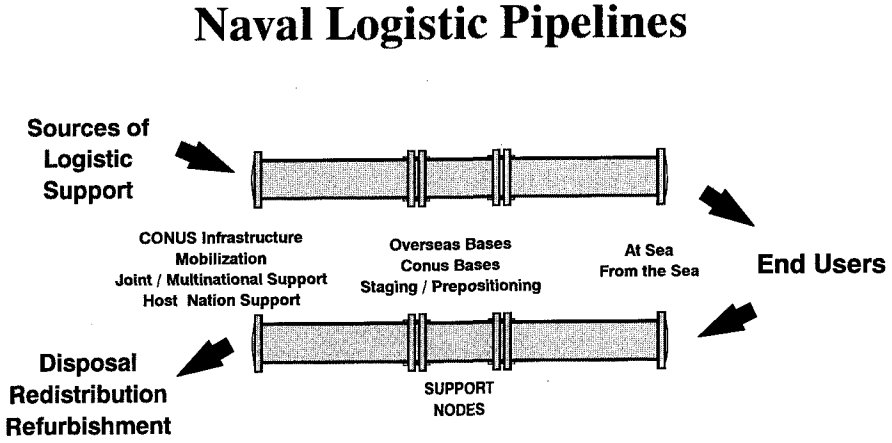


FIGURE 4-1

The flow of logistic support begins by obtaining services and commodities from reliable, high-quality sources. This support enters the pipeline—the combination of facilities, installations, ships, aircraft, methods, and procedures designed to receive, store, maintain, issue and move the necessary support with and to naval forces around the world. To direct and manage the specific distribution of logistic support to the end user, we use a concept of intermediate points, which may be thought of as support nodes. We complete the pipeline by including a means of flowing logistic support back out of the

theater, during and after the operation. This entire pipeline is linked by the skill and dedication of thousands of professionals–line and staff corps officers and enlisted personnel from both the active and reserve components as well as civilians–involved in logistic planning and execution. Depending on the operation, portions of the pipeline–advanced support bases, host nation support and others–may not exist and will need to be constructed, developed or contracted.

Sources of Logistic Support

Logistic support of naval operations depends heavily upon the intricate and substantial infrastructure and industrial bases in the continental United States. In time of national emergency, the mobilization process provides additional sources and a significant increase in the volume of this support. In addition, we obtain significant logistic resources and services from other Services, agencies and supporting nations.

Continental United States. The majority of our logistic support materiel and services are either produced, provided, or managed from the continental United States. We depend upon many foreign subcontractors and component manufacturers; the relative extent of this dependence is taken into account in assessing our national security. Many of our logistic support personnel obtain their training and experience at U.S. bases, shipyards and medical facilities. Our nation's commercial infrastructure is the foundation of our logistic support system at the strategic level. It relies on the industrial base for technology, raw materials, and manufacturing to provide our nation sufficient materiel to support existing systems and produce and support new ones. The nation's agricultural and energy sectors are key components of the industrial base. This infrastructure produces our principal end items (ships, aircraft, weapon systems), and secondary items (components needed to support our end items and personnel), and maintains the constant flow of these items that we either consume or stockpile. The capability to produce these materiels–both those readily available and others requiring long lead times–must be adequate to meet (in a timely manner) the demand generated by the operational tempo of our forces.

Mobilization. The flow rate of the logistic pipeline is linked directly to the mission requirements of our operating forces. Increases in our operating force activity must be met by a concurrent mobilization of the logistic resources and services required to support accelerated operations. Mobilization entails assembling and organizing national resources—e.g. personnel, transportation, industry, energy— in time of war or other emergency. Mobilization is designed to augment the size of the armed forces through the call-up of reserve individuals and units. It includes the following categories: **Selective**—limited call up to meet domestic and other emergencies; **Partial**—expansion of the armed forces to meet the requirements of war or national emergency from an external threat to national security; **Full**—call-up of all reserve components in the existing approved force structure; **Total**—organization and generation of additional units and personnel beyond the existing force structure. The authorities used in mobilizing reserves, e.g., either a presidential or congressional declaration of national emergency, also make available additional authorities for mobilizing the industrial base. We must discuss mobilization when addressing sources of logistic support; even though our logistic process remains essentially unchanged, mobilization produces a significant increase in the volume of resources flowing into the logistic pipeline.

Fleet support at the shore maintenance facilities, intelligence centers, supply centers and headquarters staff units, among other activities, uses a wide range of reserve capabilities. Similarly, support areas such as health services, legal and religious programs depend in large part on the professional skills of reservists. The experience and skills of reserve forces are essential and can be used as deployable assets or as supplements following crisis deployment of their parent elements.

Because we cannot predict when our logistic system must increase or accelerate its output of logistic resources and services, it is important to monitor and evaluate the system's capability to surge in time of national emergency, well in advance. Our nation's ability to supply the logistic pipeline and the capability of that pipeline to deliver needed logistic support to our operational forces continues to be analyzed routinely in wargames, simulations, and operational exercises. A full analysis of our logistic pipeline potential in time of war starts with an assessment of our nation's industrial preparedness.

Industrial preparedness planning is conducted by each Service. This planning analyzes the capability of the nation's industrial bases to support increased output of naval systems, equipment, and logistic resources and services in the event of mobilization. Industrial preparedness is closely related to peacetime acquisition and procurement activities. Industrial preparedness planning reviews surge and production capability, research and development, the availability of raw materials, the status of strategic stockpiles, industrial infrastructure, and the skilled labor pool. To ensure that U.S. industrial capability will be able to support the demands of mobilization, our nation uses a combination of strategies that includes new production, restart production, sustained low-rate production, and high-rate production with storage. Appropriate use of these strategies should occur during peacetime to ensure the availability of critical materiel during crises.

Joint and Multinational Support. Logistic support in joint and multinational operations traditionally has been the responsibility of each participating Service. The concept of collective logistics, however, allows us to use limited resources more efficiently. At the operational level, the theater commander may direct cross-servicing (where the cost of support is reimbursed), common servicing (where expenses are not reimbursed), or joint servicing (where expenses are shared). In the joint Services case, the theater commander may direct Service components to support the joint force with particular logistic functions, based on that Service's being the dominant user or the most capable provider. For example, non-naval support may be provided by organizations such as the Army's Corps Support Commands for common or cross-service support, the Defense Logistics Agency for joint Service support, the Air Force for common-user airlift, and foreign countries for host nation support.

A joint force commander must be able to integrate the logistic functions of participating Services and collaborating nations alike. Joint logistic integrated operations include such operational support as Joint Logistics-Over-The-Shore Operations, cross-service agreements, and executive-agency assignment in particular functional areas. Servicing arrangements not only provide financial savings by reducing redundancy; they also can enhance our force mobility while simplifying the

overall organization by minimizing the support infrastructure we must establish in-theater. To realize these benefits, our planning must be versatile enough to take full advantage of joint and multinational logistic capabilities. Policies that are consistent with each Service's and each nation's specialized needs, standardized procedures, uniform standards, common terminology, and the free exchange of information at all levels of command will enhance the logistic support we receive and can provide in joint operations.



Host Nation Support. Host nations can be a source of logistic support, drawing upon their local infrastructure and resources. During contingencies, they can reduce the demands on our strategic lift resources. Resources from host nations encompass locally produced or stored goods and access to facilities and in-theater services such as maintenance, transportation, health services, personnel support, and other activities required for immediate support and sustainment. Prearranged host nation support can supplement significantly the ability to meet logistic support demands coming directly from continental U.S. sources. Such arrangements include the operation, maintenance, and security of ports or the construction and management of roads, railways, and inland waterways. In addition, provisions for health service and subsistence support, pipelines and bulk storage, and operation of existing communications networks may be negotiated, as well as transportation, civilian labor, communications services, and local security and police forces. When host nation support has not been prearranged, it may be necessary to

negotiate such support on deployment. In these circumstances, deployed forces may require the presence of trained contractual and financial personnel to arrange for certain aircraft repair and master ship maintenance contracts, to secure transshipment points for logistic supplies, and to provide ready and rapid access to port facilities.

Support Nodes

Support nodes such as advanced support bases and sites correlate force needs and logistic status information and assist in matching the flow rate of services and materiel from sources to users, so that transfer and delivery is controlled and efficient. Additionally, they contain prepositioned stocks and are focal points where the flow of logistic support is received for further redirection or staging. Although most of our support nodes are located overseas, interfacing between continental U.S. bases and forward-deployed naval expeditionary forces, support nodes also can be U.S. bases supporting naval force operations directly. Support nodes ensure that logistic support is available and gets to the end user.

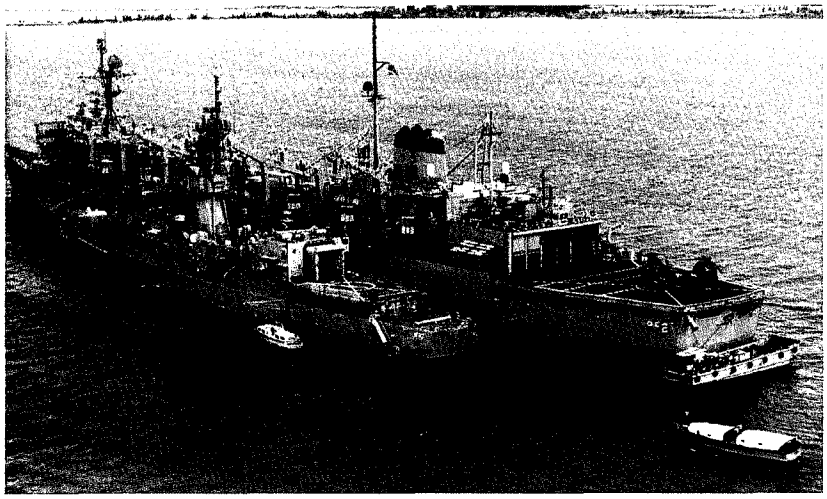
Continental U.S. Bases. Naval depots, inventory control points, distribution centers, logistic bases, arsenals, medical facilities, personnel support activities, homeports, and operating bases located in the United States provide the majority of logistic support to U.S. naval operations. While in continental U.S. bases, our forces receive fuel, housing, engineering, contracting, and personnel support services–and, at some locations, intermediate maintenance support. Naval forces maintain their inventories of food, fuel, repair parts, consumables and ammunition by drawing upon these bases to support their day-to-day needs. Across the full range of operations in peace and war, these bases are the principal interface for our forces operating in local regions and are the first extension of the logistic pipeline to our advanced support bases.

Advanced Support Bases. Advanced support bases are essential support nodes. Advanced bases are overseas areas or localities in or near the theater of operations from which we organize logistic facilities to conduct and support naval operations. Advanced support

bases may be joint and may be configured to support multinational operations. Advanced support bases may be permanent–long term, well-developed installations–or situational facilities established to support specific operations. Permanent bases are generally integrated into the logistic support capabilities of the host nation, and have, or have access to, well-established airlift, sealift, storage, and transshipment facilities. These bases are designed to support both our day-to-day forward presence and our crisis-response operations. When logistic support from existing permanent bases is either inaccessible or inadequate for a particular contingency, we may use available host nation facilities or construct temporary advanced support bases for the situation, using civilian contractors or the Naval Construction Force. The use of situational (temporary) bases allows us to position logistic support nodes in the best proximity to the operation. Primarily established ashore, temporary support bases consist of naval forward logistic sites, which are positioned as close as possible to our operating forces, and naval advanced logistic support sites, which are located in the theater of operations but remote from the immediate battle area.

Collectively, our sources of logistic support are capable of providing all the materiel and services we need to continue operations. The capacity to supply such needs, however, can exceed the receiving capability of any individual unit or task force. Early in the deployment phase of Operation Desert Shield, very little materiel was moved into theater, mostly because of lift constraints. Later, when theater stock objectives were raised from 30 to 60 days of supply, and sealift was not a constraining factor, containerized subsistence items were pushed into theater without in-transit visibility of the contents, resulting in significant delays at the receiving docks. This problem was compounded by a lack of logistic discipline. Delays would cause commanders to reorder and raise the shipping priority of all their needs to the highest level regardless of the item. The problem was diminished by implementing an apportioned lift philosophy, under which each component commander had his own daily tonnage of lift and could set his own priorities. Logistic discipline and properly functioning support nodes that monitor and regulate logistic flow are essential to providing the logistic support at the time it is needed.

Naval advanced logistic support sites are designated to receive (from airlift and sealift), store, consolidate, and transfer logistic support materiel, services, and personnel. In many situations this logistic support may go directly to our forward-deployed units. Naval forward logistic sites assist naval advanced logistic support sites by staging and facilitating locally the throughput of battle-damage repair and equipment-maintenance services as well as high-priority cargo. They may expand to include capabilities nearly equivalent to that of a naval advanced logistic support site. Temporary bases are dynamic. As the operation moves, additional naval forward logistic sites may be established or disestablished as required.



Temporary support bases may draw upon war reserve materiel, facilities, and host nation provided services. They are staffed by naval component theater support personnel and augmented by specialized packages of personnel, facilities, equipment, or materiel. These groupings are known as Advanced Base Functional Components.[15]

[15] Two reserve organizations have been created to enhance operational requirements through coordination of shore-based logistic support. The Logistics Task Force (LTF) was created to assist the Fleet Commanders-in-Chief in planning and execution of logistic functions, and to obtain appropriate mix of reserve forces at shore-based logistic support nodes. The Expeditionary Logistics Support Force (ELSF) was established to organize, equip, and train the supply, transportation and fuel-related Advanced Base Functional Components.

Each is designed to fulfill a specific capability. By combining a number of these packages, the theater commander can supplement or expand organic capabilities of assigned forces to meet operational requirements. Capabilities of Advanced Base Functional Components include administration, harbor control/defense, communications, supply/fuel/transportation, maintenance, cargo handling, health services, ordnance, camp and welfare, construction and engineering, and special groups.

The ultimate goal of advanced basing is a logistic structure that is flexible, supports the concept of operations, and meets the needs of the warfighters. Advanced support bases are an essential link in providing responsive and continuous logistic support when naval forces are functioning independently or together with joint and multinational forces.

Staging/Prepositioning. Closely linked to the advanced support bases concept are the concepts of forward positioning stocks and staging war reserve materiel. Forward positioned stocks are intended to bridge the gap between a conflict's initial logistic needs and the time that continental U.S.-based stocks begin to flow into the theater to sustain prolonged combat operations. Separate from forward-positioned stocks, placing war reserve materiel at advanced support bases, in theaters of potential conflict, reduces intertheater lift requirements and frees strategic lift assets for other use.

Although not all war reserve materiel is prepositioned, staging critical materiel at forward deployed or U.S. based locations in advance of requirements enhances considerably the mobility of our operating forces, by allowing them to proceed directly to a troubled region where this materiel can be made available immediately. Measured in days of supply, war reserve materiel includes mission essential major end items, secondary items in all classes of supply, and munitions organized into two major categories: starter stocks and swing stocks.[16] Our overall war reserve materiel requirements are based on

[16] Additional details are contained in DoD Directive 3110.6_, War Reserve Material Policy.

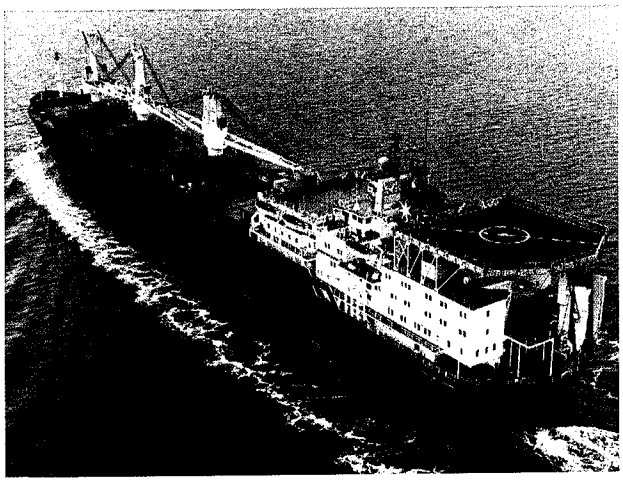
supporting operational and other stockage objectives consistent with Secretary of Defense planning guidance. Starter stocks are allocated to the forces assigned in a unified command. They are located in or near a theater of operations and intended to provide the initial sustainment of our combat forces in a crisis until resupply at wartime rates is established. Landing Forces Operational Reserve Material, prepositioned on board selected amphibious ships, is an example of a starter stock.

Swing stocks complement starter stocks as a follow-on source of supply in a contingency and can be stored afloat or ashore. These stocks are sized and organized to support more than one contingency in more than one theater of operations. Collectively, swing stocks are held by the Services or by Department of Defense materiel managers until assigned to a particular combatant command. These stocks also may be relocated to support contingency needs. The materiels associated with the Advanced Base Functional Components are considered mostly swing stocks because this materiel is directed into a theater of operations when the component is mobilized. Specific stocks prepositioned afloat are a special subset of war reserve materiel.

In the late 1970s, the United States began a program of storing Marine Corps combat equipment and consumables in commercial ships with civilian crews, when suitably located sites for logistic shore depots were unavailable in Southwest Asia. The concept called for the U.S.-based Rapid Deployment Joint Task Force to be airlifted to a port where they could "marry up" with the equipment and supplies to perform their assigned mission. Today, the Afloat Prepositioning Force has evolved into two programs: the Marine Corps' Maritime Prepositioning Force and the Prepositioning Ships, which support all Services.

The Maritime Prepositioning Force is considered a naval power projection asset because of its significance in supporting the employment of naval expeditionary forces. The Maritime Prepositioning Force consists of three squadrons of civilian-owned and operated roll-on/roll-off ships under long-term lease to the Military Sealift Command. Each squadron is loaded with all the

equipment needed to support a Marine Expeditionary Force (Forward) of up to 16,500 personnel and associated Navy support elements, and 30 days of supplies. Special mobile cargo-handling and port-operations units are trained and equipped to deploy and offload these ships rapidly once they reach port. In time of war or national emergency, a unified commander-in-chief can commit these stocks to regional conflicts. Maritime Prepositioning Force stocks are counted as part of the overall war reserve materiel assets.



The Prepositioning Ships consist of a combination of government-owned and leased ships managed by the Military Sealift Command. These ships, strategically located around the world, contain stocks of subsistence items, construction supplies, medical supplies, ammunition, packaged and bulk petroleum, oils, and lubricants supporting all Services. Although most afloat prepositioned stocks are stored in general bulk quantities, some of the ships supporting the Army are loaded with unit sets of equipment and have a limited in-stream offload capability.

The receiving, staging, and management functions of support nodes such as advanced support bases, continental U.S. bases, and prepositioning sites allow them to collect and feed back critical data to the logistic information system on the needs and logistic status of the operational commander. Their primary purpose, however, is to get logistic support and services to the end users—naval forces operating at sea and ashore—promptly and efficiently.

End Users

Logistic support users are the operating forces, afloat and ashore, located around the world. The variety of fleet customers in terms of needs, priorities, location, and receiving capabilities requires a flexible and responsive support system. Determining what support is needed and when that support should be inserted into the distribution pipeline is a significant challenge confronting logisticians at all levels. Continuous logistic support depends on predicting future consumption accurately, determining what the end user will need, and getting it there. In war, particularly with short-notice hostilities, consumption rates are unpredictable, communications between the theater and the support infrastructure may be limited (or unavailable), and delivery times uncertain. Weighing these impediments to availability, the logistic commander considers the advantages and disadvantages of two primary concepts of providing support. Materiel and support forces can be provided from staging points without request, based on anticipated needs (push), or as determined by user demand (pull).

"Pushing" Supplies into Theater—Providing certain support automatically can reduce the administrative burden on the operational commander. The "push" concept requires an accurate estimate of the expected tempo of operations and the consumption rate of various kinds of materiel and other support. Underestimating consumption may result in a shortage; overestimating creates in-theater receipt and storage problems. For these reasons, the "push" system is seldom used at the strategic level to resupply a theater. However, its use at the operational and tactical levels, within a theater, is far more common.

PUSHING SUPPLIES IN THEATER

During the latter stages of Operation Desert Shield, Marine forces prepared to conduct a two-division breach of the Iraqi defenses in western Kuwait. The Commander of the Direct Support Command task-organized the combat service support element to help implement the commander's intent. He selected a system of support in which materiel was automatically provided, based on anticipated needs. This "push" system required the combat service support area be established in close proximity to the breaching operation. The staging area selected was named Al Khanjar, "the Dagger." In just 14 days the 11,280 acres of Al Khanjar encompassed a 780-acre ammunition supply point, a tank farm holding 5,000,000 gallons of fuel and 1,000,000 gallons of water, and the third-largest Naval hospital in the world. Al Khanjar was key to providing combat service support to the 1st and 2d Marine Divisions. During their attack to Kuwait City, specific quantities of rations, fuel, and ammunition were pushed from Al Khanjar to the attacking units (tactical level). Predetermined quantities of supplies also were pushed from other ports to maintain the desired dump levels at Al Khanjar (operational level). This combination of operational and tactical level use of the "push" system provided uninterrupted support and flexibility as the Marines fought through the Iraqi defenses during the liberation of Kuwait.

"Pulling" Supplies into Theater—In the "pull" concept of supply, an operating unit directly controls the reorder of materiel to replace consumed stock as well as the calls for engineering, maintenance and other support forces. This concept has been a logical outgrowth of improved communications between strategic, operational and tactical logistic levels and a more responsive distribution pipeline. Initially, combat forces may enhance their mobility by carrying only a basic level of support. As our forces advance, however, replacement of their consumed stocks becomes increasingly dependent on establishing and protecting intermediate resupply points.

In support operations at sea—as well as from the sea—we employ a combination of both methods. At the strategic and operational levels, Navy Combat Logistics Force ships, tenders, maintenance-related ships, hospital ships, and organizational and intermediate maintenance activities all push most of the projected logistic support into the theater, based on the anticipated level of operations. At the tactical level, combat forces requisition (pull) their specific needs, according to their consumption rates and employment, from in-theater Combat Logistics Force ships and advanced bases. Combat Logistics Force ships replenish their stocks by requisitioning (pull) replacement materiel from rear area bases. Pull is frequently considered when we desire to minimize the battle force's "footprint", are significantly limited by a shortage of transportation assets, or when time is insufficient to allow for push operations. In a large operation requiring significant logistic support afloat as well as ashore, the logistic commander weighs the benefits and risks of both methods and may choose push, pull or a combination—based on the mission, amount of logistic support needed, and the environment in which this support is provided.

Support At Sea—Naval Forces Afloat. The ability to replenish our naval forces at sea enables the United States to maintain its forward presence, and conduct operations of unlimited and uninterrupted duration close to areas of interest. At-sea replenishment encompasses the coordinated movement of passengers, mail, cargo, and bulk liquids for deployed forces as large as a battle group to individual ships and submarines conducting independent operations.

The task of supporting naval forces afloat requires that coordinators carefully balance time, sources of support, the priority needs of our deployed forces, and current force operations. For example, timely handling, delivery, and dispatch of mail—crucial to morale and administrative continuity—may be integrated with an emergent requirement to transfer essential repair materiel or support personnel. Balancing and coordinating logistic support for naval forces afloat is accomplished with a cadre of highly trained personnel, dedicated to keeping the logistic pipeline flowing. They get logistic support materiel and services made available by the Combat Logistics Force to and from end users

by using the specialized underway replenishment capability of our ships. These coordinators manage the commander's support resources, maintenance capabilities and organic distribution assets.

Versatile and reliable systems allow us to take advantage of scheduled and unscheduled opportunities to resupply our forces at sea. Although circumstances may dictate in-port replenishment, the uniqueness and flexibility of naval logistics is best exemplified by replenishment at sea. Using both connected and vertical replenishment operations, we routinely resupply our ships underway. Connected replenishment employs rigs to transfer fuel, stores, and ammunition while one or more ships steam alongside a delivery ship. Vertical replenishment delivers stores, ammunition and other supplies by helicopter. This fast and efficient means of replenishment is conducted daily, around the world, in the same manner in peacetime as in wartime.

Employing underway replenishment, battle groups, amphibious ready groups, and individual ships receive supplies at sea from Combat Logistics Force ships.[17] The Combat Logistics Force is highly mobile and carries a broad range of stores, including fuel, food, repair parts, ammunition, and other essential materiel to keep the naval forces operating at sea for extended periods. It consists of station ships, shuttle ships, and a variety of other support ships.

Station ships bring logistic support to and accompany naval forces. Navy-crewed or crewed by Military Sealift Command personnel and military detachments, they support a typical battle group with fuel for 20-30 days, consumables other than fuel and ordnance (e.g., food, paint, rags, and lubricants) for 75 days, spare parts for 90 days, and ordnance. Station ships such as oilers, ammunition ships, and stores ships, typically carry multiple products and have seakeeping characteristics that allow them to operate with the battle group.

[17] The Combat Logistics Force includes both active Navy ships and those operated by the Military Sealift Command within the Naval Fleet Auxiliary Force.

Shuttle ships include oilers, ammunition ships, and stores ships crewed by Military Sealift Command personnel and military detachments. Shuttle ships resupply both the station ships and combatants and are themselves resupplied at advanced support bases or continental U.S. bases. When distance or consumption rates outstrip the capacity of the shuttle force, the Merchant Ship Naval Augmentation Program ships augment the Combat Logistics Force. They are part of the Ready Reserve Force and are maintained in an inactive or reduced operating status, available to get underway in 5-20 days.

Other support ships include Navy-crewed tenders and salvage ships. Tenders are specially configured to provide intermediate-level maintenance support to deployed and non-deployed forces.[18] They have full intermediate-level repair capability in the hull, mechanical, and electrical repair areas and have extensive battle-damage repair capabilities. Although initially designed to serve one type of customer, they are becoming increasingly able to support both surface ships and submarines. These ships typically provide their support services from relatively secure ports or anchorages, with the tended forces coming to their location. Salvage ships are configured for off-ship firefighting, diving, towing and salvage missions. These ships normally operate independently of naval force formations and can provide rapid-response, first-line battle damage repair. The Combat Logistics Force makes it possible to implement the philosophy of maintaining high logistic support levels and the concept of centrally coordinating maintenance and battle damage repair capabilities, as well as sharing needed parts and limited support personnel.

In conflict as well as day-to-day operations, commanders recognize the need to replenish their ships on a regular and sometimes spontaneous basis in accordance with the established logistic support plan. As the naval expeditionary force commander positions the force at sea, sustainment requirements may change quickly. Opportunities to conduct replenishment operations may be unpredictable and

[18] Aircraft carriers and aviation amphibious ships (i.e., LHA, LPH, and LHD) also possess an organic hull, mechanical, and electrical repair capability and all have an Aviation Intermediate Maintenance Department.

should be exploited rapidly when available. Ships on the front line are rotated regularly with fresh ships to conduct needed replenishment in protected rearward areas. In exercise scenarios, we build in replenishment periods as an integral part of underway operations. Such considerations as the nature of the operations, regional tensions, availability of logistic resources, and minimum and desired logistic support levels established by the theater commander drive the frequency of these needed replenishment periods. Factoring in all these concerns and the need to anticipate contingencies, commanders aggressively seek opportunities to top off their logistic support levels whenever possible. Having the requisite supplies and materiel on board, however, fulfills only part of the requirements that enable our forces to remain on station. Using that materiel, we keep mission-essential and safety-related equipment in repair, using on board repair capability and the battle force intermediate maintenance activity concept.

The process of coordinating the organic capabilities, resources and personnel of the ships in a naval force to sustain battle readiness underway and on station is accomplished with the battle force intermediate maintenance activity management concept of operations. Battle force intermediate maintenance activity coordinators screen, broker and conduct underway repairs using the ship best able to accommodate the work. Having comprehensive information on such inherent naval force capabilities as structural, mechanical, electrical, electronics, communications, and avionics repair, these coordinators also can arrange outside assistance when the situation is beyond the capability of the naval force. The logistic information that helps the battle force intermediate maintenance activity coordinator manage repair efforts efficiently also permits the efficient distribution of critical support personnel and materiel.

The material control officer concept is another naval force logistic concept of operations that enables ships within a group or theater to obtain spare parts urgently required on one ship that may be available for redistribution from another ship. In addition, medical, chaplain and other logistic support is shared as available and needed among ships of the naval force. The battle force intermediate

maintenance activity and material control officer concepts promote the efficient and economical self-sufficiency of our deployed ships.

The movement of passengers, mail, and cargo is essential in sustaining our forces at sea. Using the Combat Logistics Force, our specialized replenishment capabilities, and logistic concepts of operations, we enhance force readiness and end-user self-sufficiency while deployed.

Support From the Sea—Naval Forces Projecting Power Ashore.

> *"No matter who carries the load in any fight—soldiers, sailors, airmen or marines—they need to be supported and supplied from the sea."*
>
> — Admiral Arleigh A. Burke, USN

Supporting naval operations *from* the sea involves the same naval logistic system that supports operations at sea: the Combat Logistics Force, advanced support bases, and the continental U.S. infrastructure. As naval expeditionary forces conduct power projection ashore and battlespace dominance from the sea, logistic support must be able to sustain our forces at sea while extending an equally flexible and responsive system ashore to support the landing force. The commander's intent and the operational concept will determine whether the logistic system and combat service support will be sea-based or evolve to shore-based logistic support.



Amphibious forces represent the naval expeditionary force's forcible-entry capability. These forces deploy with sufficient supplies for initial sustained combat operations. A landing force is an example of a Marine air-ground task force, a task-organized, combined-arms component of naval expeditionary forces. The Marine air-ground task force contains four elements: the command element, the ground combat element, the aviation combat element, and the combat service support element. As is the case for units of battalion/squadron size or larger, each element has limited organic combat service support capabilities and it is the commander's responsibility to use these assets fully. The combat service support element has the mission of supplementing the organic support of each element of the Marine air-ground task force in all logistic functions.[19]

Getting the landing forces ashore requires amphibious assault shipping and tactical airlift. Sufficient assault shipping is not available to transport the entire landing force. The landing force is therefore usually divided into the assault echelon (transported in amphibious assault shipping, and landed by assault craft and helicopters), and the assault follow-on echelon (transported by commercial roll-on/roll-off or containerships, and airlift). In addition, an expeditionary airfield system enables Marine aircraft to rapidly transfer ashore and operate from undeveloped bases and hastily constructed runways.

The buildup of both combat power and logistic support ashore is facilitated by numerous temporary task organizations such as the Tactical Logistics Group, the Landing Force Support Party, and the Naval Beach Group. These organizations are composed of landing force and Navy units and become responsible for the landing and movement of waterborne troops, equipment, and supplies, plus the evacuation of casualties and prisoners of war. In joint operations, the Army's Terminal Service Units, long-haul truck, supply, and ordnance units also may support amphibious operations.

[19] Further discussions of Combat Service Support and logistic support for the Aviation Combat Element are contained in Fleet Marine Force Manuals 4 and 5-1, respectively.

Three basic approaches to supporting amphibious operations and power projection ashore are used: seabasing, sea echelon, and building up logistics ashore through beach support areas and combat service support areas. In seabasing, the majority of combat service support assets remain afloat, sent ashore only when needed. Seabasing increases helicopter support requirements. It provides flexibility and mobility in dispersing tactical forces in amphibious operations. Sea echelon reduces the concentration of amphibious ships in the immediate objective area where ships are called forward only as needed. It requires detailed planning to ensure the troops, supplies and equipment are embarked correctly to correspond with phased entry. The third approach, buildup of logistics ashore, employs a beach support area developed by the landing support element, which permits an initial buildup of sustainment ashore and establishment of a combat service support area that provides sustained support to the landing force.

The logistics ashore approach is situationally dependent, influenced by the expected scope and duration of the operation. In large-scale scenarios in which there is no opposition by the enemy, Logistics-Over-The-Shore operations may be used. These operations are used to sustain forces ashore after the assault and involve the loading and unloading of ships without the benefit of fixed port facilities during phases of theater development. Logistics-Over-The-Shore can be used over unimproved shorelines, in shallow-draft ports, in damaged ports, or in ports with inadequate cargo offloading facilities to sustain forces ashore after the initial assault. Some Logistics-Over-The-Shore operations may become Joint Logistics-Over-The-Shore operations, involving units and equipment from the Army, Navy, and the Marine Corps. These operations employ specially configured ships to facilitate offloading from other than amphibious ships.

Supporting our forces ashore also depends upon special-purpose ships that can be activated on short notice to provide additional intermediate-level health support and aircraft maintenance services. Such shipping includes hospital ships and aviation logistic support ships. Hospital ships are maintained by the Military Sealift Command in a reduced operating status, but are ready to provide full medical care when activated. The medical spaces are fully equipped with state-of-the-art medical equipment and staffed by pre-identified medical personnel coming from shore-based naval hospitals. Aviation logistic support ships are dedicated sealift for moving or operating an aviation intermediate maintenance activity to support a deployed Marine air-ground task force aviation combat element. Aviation personnel may deploy with the ship or be flown in to rendezvous with the ship once it arrives in theater. Intermediate maintenance and supply support may be performed on board the ship, underway or at anchor, or the ship may be offloaded as needed to an expeditionary site ashore. They are designed to embark a task-organized Marine aviation logistic squadron, tailored to support a particular mix and number of type, model, and series aircraft.

Naval logistic support at sea and from the sea relies on its complete integration with operational objectives. The logistic effort must be adaptable to changing missions and priorities, continuous, and reliable—never becoming hostage to a single source or mode of support. Together, advanced support bases, prepositioned assets, and the Combat Logistics Force provide flexible sustainment support of naval operations.

Retrograde and Disposal. Navy and Marine Corps forces are most likely to be first on the scene when a crisis threatens U.S. interests. They are also likely to be among the last to leave, after the situation stabilizes. The redeployment of enormous numbers of personnel and disposition of amounts of combat materiel is a significant responsibility that requires detailed planning. The need to return personnel home promptly and recover some equipments immediately is driven by many factors—including security, morale, and political concerns.

Because of its unequaled capacity, sealift will deliver the vast majority of war stocks in theater. Similarly, as forces redeploy, most of the recoverable materiel will return by sealift, either via support nodes or directly to its ultimate destination. During conflict, assets in need of repair or refurbishment also may require movement out of theater. The naval logistic system has the capability to ensure that this materiel is safely returned to its ultimate destination (often the continental United States) or responsibly disposed of without degrading the environment.

Another aspect of retrograde is the evacuation of sick and injured personnel. Health Services provides five echelons of care. We achieve continuity in care and treatment by moving the patient through a progressive, phased system, from the forward area of the combat zone extending rearward, as required by the patient's condition. Lower echelons of care are highly mobile, with a very limited capability to provide extensive medical care. Higher echelons of care have greater capability to provide medical care but are less mobile. Health Services emphasize returning to duty as many of the sick and injured as possible, while treating, stabilizing, and preparing the remaining patients for evacuation to an appropriate rearward echelon of care.

Planning for operations from the sea focuses on the buildup of combat power ashore. Support for sustained operations ashore entails marshalling and delivering considerable stocks of non-unit supplies, equipment, and personnel. In most cases, significant quantities of these supplies and equipment will not have been expended during the operation and will require movement out of the area for redistribution. Upon completion of naval operations or during continuous routine operations, personnel, equipment and cargo require movement from the theater of operations back to the United States or to another theater. Such movements of personnel and items away from the theater are known as retrograde or redeployment operations. Retrograde usually occurs at the end of an operation, but battle-damaged equipment may require return for repair during the operation. Perhaps the most impressive example of this was the extraordinary three-day shipyard repair of the severely damaged USS Yorktown (CV-5) in 1942. This heroic effort supported her return to service for

RETROGRADE

Operation Desert Sortie

Promptly after the victory over Iraq, the Defense Department began the sizable task of withdrawing U.S. forces and materiel from the Arabian Peninsula. Between August 1990 and March 1991, the Navy's Military Sealift Command had delivered 459 shiploads of cargo to the Kuwaiti Theater of Operations. Additionally, the Air Force's Air Mobility Command had also deposited sizeable cargoes in Saudi Arabia. By March 1991, approximately 6 million measurement tons of supplies and material, including 945,000 pieces of unit equipment, remained in the theater. R-Day was 10 March 1991, the official date when U.S. forces began withdrawing from the region. Central Command planners divided the redeployment into two, chronologically overlapping stages. Stage I involved the redeployment of combat units and their equipment. Central Command component commanders and those of other unified and specified commands had worked up a time-phased force deployment list to determine the sequence in which units would depart the theater.

To ensure rapid reconstitution of combat forces in the United States, Europe, and the Pacific, personnel and their equipment withdrew in unit formations. In general, U.S. Navy ships carried their own crews home, while the Air Mobility Command transported Naval reservists. Ships carried more than 95% of all material returned from the theater. Unlike similar operations after the Korean and Vietnam wars, in Desert Sortie the United States mounted an unprecedented effort to clean up the theater of operations before closing it down. Before leaving the Arabian Peninsula, U.S. forces dismantled buildings and other structures and put their bases in trim. On the average, units left behind 20% of their personnel for cleanup purposes and the **disposition** of material. U.S. personnel accounted for, segregated, dismantled, cleaned, packed up, and loaded thousands of armored fighting vehicles, trucks, and aircraft as well as enormous amounts of equipment, ammunition, and supplies on board ships of the Navy's Military Sealift Command.

As Central Command's combat units departed, joint teams of Military Sealift Command ship schedulers, Army stevedores, Navy cargo handlers, Marine load specialists, and merchant ship crews coordinated the redeployment of material. During the first 120 days of Desert Sortie, U.S. forces shipped more than 117,000 wheeled and 12,000 tracked vehicles, 2,000 helicopters, and 41,000 containers of supplies. The joint teams often loaded out more than 20 ships a week. By mid-July, the services had stowed 903,000 short tons of equipment in 236 ships. Delivery of the last **sustainment** material the following December, 21 months after the end of the war, brought to a close one of the most successful **retrograde** operations in U.S. military history.

the Battle of Midway, a major turning point of World War II. Shipping used for transporting supplies to the theater is usually available for retrograding this equipment although airlift may be needed for urgent repairs or return.

In some cases, materiel may be designated for disposal instead of retrograde. The handling, storage, and disposition of enormous amounts of wartime materiel is a significant concern for a joint force commander. Adherence to international, national, regional, state, and local environmental protection laws is a personal responsibility of naval commanders, ashore and afloat. Complying with these regulations requires conscientious action by everyone in the chain of command. Noise, air, and water pollution, waste disposal, and hazardous materiel storage are only a few of many areas of concern. The requirement to minimize environmental damage to training areas also influences the conduct of training exercises. Many of these issues impact on operations, and efforts to prevent or correct environmental damage also have significant logistic implications. Thus, while not a specifically defined logistic function, environmental protection and compliance impacts on many logistic support functions, especially materiel, transportation, medical, and engineering.

The concept of a logistic pipeline represents the enormously complex execution of the naval logistic process. It illustrates a system that observes the principles of logistics, channeling the elements of the logistic process in each functional area. Functioning across the wide range of operations in peace and war, it accomplishes the naval logistic support goal–getting the right support to the right place at the right time.

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CONCLUSION

"Victory is won or lost in battle, but all military history shows that adequate logistic support is essential to the winning of battles."

— Dan A. Kimball
Secretary of the Navy, 1952

Our nation's military might is dependent upon our ability to project power decisively. But power projection is more than striking from a distance. It must include an ability to sustain the forces that will conduct and exploit those strikes. Naval power projection—the application of offensive force against an enemy at a chosen time and place—includes and is made possible by a dynamic logistic support system that extends from the leading edge of engagement all the way back to our national industrial bases and worldwide sources of raw material. We see the influence of our logistic system in every operation. When a weapon system is brought to bear, we count on its reliability because it has been maintained by skilled technicians and supported by an extensive supply and engineering network. When Marines land across the beach, they know that complete stocks positioned for the operation will contain all the materiel they may need until long-term sustainment is established, and the health-services system that attended to their routine needs is ready for casualty response. Naval logistics is an integrated system that supports day-one readiness, and provides substantial initial and continuous sustainment through a responsive logistic pipeline that taps into the industrial might of the United States.

Success or failure in military operations derives from the relative combat power military forces can bring to bear against an enemy and the leadership, skill, and tenacity with which it is applied. The naval logistic system exists to meet the operational needs of our forces and is linked directly to our combat power and ability to apply that power. It is a tool of the commander, a component of his warfighting effectiveness that assists him in seizing and maintaining the initiative. Because of its critical role, it can also be a prized target of the enemy if left unprotected.

GLOSSARY

Combat Service Support: The essential capabilities, functions, activities, and tasks necessary to sustain all elements of operating forces in theater at all levels of war. Within the national and theater logistic systems, it includes but is not limited to that support rendered by service forces in ensuring the aspects of supply, maintenance, transportation, health services, and other services required by aviation and ground combat troops to permit those units to accomplish their missions in combat. Combat service support encompasses those activities at all levels of war that produce sustainment to all operating forces on the battlefield. (Joint Pub 1-02)

Force Sustainment: Capabilities, equipment, and operations that ensure continuity, freedom of action, logistic support, and command and control. (NWP 1-02)

Forward Presence: Forward deployed forces or forces overseas to demonstrate national resolve, strengthen alliances, dissuade potential adversaries, and enhance the ability to respond quickly to contingencies. (NWP 1-02)

Industrial Preparedness: The state of preparedness of industry to produce essential materiel to support the national military objectives. (Joint Pub 1-02)

Infrastructure: A term generally applicable to all fixed and permanent installations, fabrications, or facilities for the support and control of military forces. (Joint Pub 1-02)

Integrated Logistic Support: A composite of all the support considerations necessary to assure the effective and economical support of a system for its life cycle. It is an integral part of all other aspects of system acquisition and operation. (Joint Pub 1-02)

Interagency Coordination: Coordination within the context of Department of Defense involvement, the coordination that occurs between elements of Department of Defense and engaged U.S. government agencies, nongovernmental organizations, private voluntary organizations, and international organizations for the purpose of accomplishing our objective. (Joint Pub 3-08)

Joint: Connotes activities, operations, organizations, etc., in which elements of more than one Service of the same nation participate. (Joint Pub 1-02)

Lines of Communications: All the routes, land, water, and air which connect an operating military force with a base of operations and along which supplies and military forces move. (Joint Pub 1-02)

Littoral: Those regions relating to or existing on a shore or coastal region, within direct control of and vulnerable to the striking power of naval expeditionary forces. (NWP 1-02)

Logistics: The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, those aspects of military operations which deal with: a. design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of materiel; b. movement, evacuation, and hospitalization of personnel; c. acquisition or construction, maintenance, operation, and disposition of facilities; and d. acquisition or furnishing of services. (Joint Pub 1-02)

Maritime Prepositioning Force: Civilian-crewed, Military Sealift Command-chartered ships which are organized into three squadrons and are usually forward-deployed. These ships are loaded with prepositioned equipment and 30 days of supplies to support three Marine expeditionary brigades. (Joint Pub 1-02)

Starter Stocks: War reserve materiel stocks prepositioned in or near a theater of operations and intended to last until resupply at wartime rates is established. (DoD Directive 3110.6)

Swing Stocks: War reserve materiel stocks positioned ashore or afloat for meeting war reserve requirements of more than one contingency in more than one theater of operations. (DoD Directive 3110.6)

War Reserve Materiel: Mission essential secondary items, major end items, and munitions required to attain operational objectives in the scenarios authorized for sustainability planning in the Secretary of Defense planning guidance. (DoD Directive 3110.6)

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