Joint Publication 4-03

Joint Bulk Petroleum and Water Doctrine

11 January 2016

PREFACE

1. Scope

This publication provides fundamental principles and guidance for providing bulk petroleum and water in support of joint operations.

2. Purpose

This publication has been prepared under the direction of the Chairman of the Joint Chiefs of Staff. It sets forth joint doctrine to govern the joint activities and performance of the Armed Forces of the United States in joint operations, and it provides considerations for military interaction with governmental and nongovernmental agencies, multinational forces, and other interorganizational partners. It provides military guidance for the exercise of authority by combatant commanders and other joint force commanders (JFCs), and prescribes joint doctrine for operations and training. It provides military guidance for use by the Armed Forces in preparing and executing their plans and orders. It is not the intent of this publication to restrict the authority of the JFC from organizing the force and executing the mission in a manner the JFC deems most appropriate to ensure unity of effort in the accomplishment of objectives.

3. Application

a. Joint doctrine established in this publication applies to the joint staff, commanders of combatant commands, subunified commands, joint task forces, subordinate components of these commands, the Services, and combat support agencies.

b. The guidance in this publication is authoritative; as such, this doctrine will be followed except when, in the judgment of the commander, exceptional circumstances dictate otherwise. If conflicts arise between the contents of this publication and the contents of Service publications, this publication will take precedence unless the Chairman of the Joint Chiefs of Staff, normally in coordination with the other members of the Joint Chiefs of Staff, has provided more current and specific guidance. Commanders of forces operating as part of a multinational (alliance or coalition) military command should follow multinational doctrine and procedures ratified by the United States (US). For doctrine and procedures not ratified by the US, commanders should evaluate and follow the multinational command's doctrine and procedures, where applicable and consistent with US law, regulations, and doctrine.

For the Chairman of the Joint Chiefs of Staff:

WILLIAM C. MAYVILLE, JR.
LTG, USA
Director, Joint Staff

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SUMMARY OF CHANGES
REVISION OF JOINT PUBLICATION 4-03
DATED 09 DECEMBER 2010

- **Updates figures to reflect current doctrinal changes and assist contemporary content visualization.**
- **Adds Appendix D, "Water Scenario," which outlines notional actions to perform during the initial stages of a contingency.**
- **Clarifies joint bulk petroleum logistics requirements submission.**
- **Redefines joint bulk petroleum responsibilities.**
- **Elaborates on quality management.**
- **Simplifies operational contract support and international logistics acquisition agreements.**
- **Correctly defines pre-positioned war reserve stock.**
- **Restructures joint bulk petroleum logistics planning consideration.**
- **Expands upon bulk petroleum logistics tactical systems execution.**
- **Expounds upon bulk water purification, storage, and distribution consumption requirements.**

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EXECUTIVE SUMMARY
COMMANDER'S OVERVIEW

- **Discusses joint bulk petroleum concepts and principles**
- **Describes planning and execution for joint bulk petroleum logistics**
- **Outlines responsibilities at each level of authority**
- **Describes the principles of bulk water purification, storage, and distribution**

Joint Bulk Petroleum Overview

Concept of Joint Bulk Petroleum Operations

Providing forces with the right fuel, in the right place, and at the right time requires planning to determine peacetime and wartime requirements, contract and allocate product, arrange for bulk storage, move products forward to and within the theater, ensure quality control, issue and account for the fuel, and maintain distribution equipment and facilities.

Bulk petroleum support to joint operations requires the Services to develop complementary tactical distribution systems and trained personnel to meet combatant command (CCMD) requirements while the Defense Logistics Agency (DLA) is required to provide fuel to all Service component missions.

Principles of Joint Bulk Petroleum

Bulk petroleum requires special handling and storage and has a demand significantly larger than other supply classes. For these reasons, any viable support concept should incorporate the principles of **standardization, flexibility,** and **interoperability.**

Joint Bulk Petroleum Logistics

The component commands determine bulk petroleum requirements for submission to the combatant commander's (CCDR's) joint petroleum office (JPO) or subarea petroleum office (SAPO). The JPO or SAPO consolidates and validates the bulk petroleum requirements for planning and support purposes and provides them to

DLA Energy for sourcing, analysis, and development of a support plan.

Bulk Petroleum in the Joint Logistics Environment

Strategic Level. The combination of Service, agency, and industry aid in the projection and long-term sustainment of the CCDR's joint bulk petroleum requirements. The strategic level emphasis is on utilizing the industrial base to enhance the CCDR's capabilities.

Operational Level. Global providers are critical components at the operational level. The Services, working with their components, provide the necessary force structure (personnel and equipment) to organize, train, and equip bulk petroleum support forces at the operational level.

Tactical Level. The responsibility to install and operate tactical petroleum storage and distribution systems usually lies with the Services.

Joint Bulk Petroleum Responsibilities

Bulk Petroleum Supply and Distribution Operations

DLA Energy supports bulk petroleum supply and distribution operations by exercising management responsibilities for consolidation and review of requirements, procurement, funding, budgeting, storage, and designated distribution of bulk petroleum to meet operational requirements. DLA Energy exercises responsibilities for the ownership of bulk petroleum in non-tactical bulk storage through sustainment, restoration, and modernization (SRM) funding for Service bulk petroleum storage and distribution facilities.

Web-Based Petroleum Contingency Report

The JPOs, at the direction of the Chairman of the Joint Chiefs of Staff, submit two key joint petroleum reports: bulk petroleum contingency report (REPOL) and bulk petroleum capabilities report (POLCAP). The REPOL provides the Joint Staff (JS), Services, and DLA Energy with summary information on bulk petroleum inventories, a damage assessment for bulk petroleum distribution systems, and other strategic information pertaining to bulk petroleum support posture at specific bases, posts, locations,

and/or forward operating bases. The POLCAP provides the Joint Staff, Services, and DLA Energy with an assessment of bulk petroleum support capabilities for contingency requirements in a specific theater.

Bulk Petroleum Quality Management

The two main functional areas of quality management are quality assurance (QA) and quality surveillance (QS). Contract provisions detail the quality requirements for commercial suppliers, while Department of Defense (DOD) 4140.25-M, *DOD Management of Bulk Petroleum Products, Natural Gas, and Coal Acquisition and Technology*, and the Military Standard (MIL-STD)-3004, *Quality Assurance/Surveillance for Fuels, Lubricants, and Related Products*, prescribe the quality management requirements for QA and QS performed by the government.

Environmental Concerns

All US military activities are required to conform to US environmental laws and guidelines as set forth in DOD issuances. Additionally, these activities must comply with all applicable state and local laws, rules, and ordinances, unless a waiver has been obtained from the appropriate authority.

Petroleum Operational Contract Support and International Logistics Acquisition Agreements

DLA Energy has responsibility for the centralized procurement of bulk petroleum for DOD. DOD components submit requests to the geographic combatant commander's JPO for validation and obtain DLA Energy authority to locally purchase petroleum products in excess of the annual limits.

Planning for Joint Bulk Petroleum Operations

Joint Bulk Petroleum Operation Planning

The JPO conducts the overall planning of petroleum logistic support for their CCMD at the strategic and operational levels. The logistics supportability analysis findings highlight logistics deficiencies and their associated risks to support theater operations.

The inventory management plan identifies the petroleum inventory levels needed to support operating stocks requirements and pre-positioned war reserve requirements and specifies the

amount of petroleum product, by location, held to cover requirements.

Defense Logistics Agency (DLA) acquires, stores, and distributes bulk petroleum with associated fuel additives to all Department of Defense (DOD) component customers wherever and whenever it is needed across the full range of operational situations.

Planning considerations for joint bulk petroleum logistics includes mission, fuel requirements, infrastructure, equipment, support units, command and control, quality, interoperability of fuel transfer systems, sustainability and survivability, threat environment, sealift and other distribution methods.

Executing Joint Bulk Petroleum Operations

Joint Bulk Petroleum Logistics Execution

DOD bulk petroleum inventories take into account economic resupply, safety levels, unobtainable inventory, and deliberate planning requirements. The movement and redistribution of assets are accomplished through a joint effort involving the CCMDs, Service components, and DLA Energy, interfacing with United States Transportation Command (USTRANSCOM) components for product movement outside the operational area.

Normal land petroleum operations may include pipeline and/or hose-line distribution, truck distribution, tactical tank farms, airfield operations, barges, and rail tank cars.

DLA, through DLA Energy, establishes and maintains a DOD bulk petroleum distribution system and related programs in coordination with the Services and the combatant commands.

DLA, Services, and CCMDs have interrelated responsibilities to plan and execute for military construction, minor construction, operation of facilities, SRM, and environmental compliance of bulk storage and distribution facilities in support of the bulk petroleum management mission.

Joint Bulk Petroleum Logistics

Authorities, Responsibilities, and Roles

The Under Secretary of Defense for Acquisition, Technology, and Logistics: is responsible for establishing policies for management of bulk petroleum stocks and facilities, and for providing guidance to other DOD agencies, Joint Staff, and Services.

Chairman of the Joint Chiefs of Staff: coordinates with DLA Energy, Services, and CCMDs to resolve petroleum issues. The **JS J-4** is the primary agent of the Chairman of the Joint Chiefs of Staff for all bulk petroleum matters.

JPO has the primary responsibility of synchronizing the fuel requirements throughout the joint force.

The **United States Army** normally provides management of overland petroleum support, including inland waterways, to US land-based forces of all DOD components.

The **United States Air Force (USAF)** maintains the capability to provide tactical support to USAF units at improved and austere locations. It also provides distribution of bulk petroleum products by air where immediate support is needed at remote locations.

The **United States Navy (USN)** provides seaward and over-the-shore bulk petroleum products to the high-water mark for US sea-based and land-based forces of all DOD components. The USN maintains the capability to provide bulk petroleum support to naval forces afloat and ashore (to include US Coast Guard forces assigned to DOD).

The **United States Marine Corps** maintains a capability to provide bulk petroleum support to its units.

The **US Coast Guard** coordinates petroleum requirements with the Navy. It also performs the roles and functions of a joint fuel logistics supply point when so designated.

Managing the Joint Bulk Petroleum Supply Chain

DLA Energy manages the bulk petroleum supply chain from source of supply to the point of customer acceptance.

Commander, United States Transportation Command

The Commander, USTRANSCOM, plans for and provides air, land, and sea transportation of fuels

for DOD during peacetime and wartime. These efforts will supplement and not replace the primary responsibilities assigned to the Services and DLA.

Multinational Partners

An acquisition and cross-servicing agreement is usually negotiated by the CCMD and is authorized under the acquisition and cross-servicing authorities, Title 10, USC, Sections 2341–2350. DLA Energy, as delegated by DOD through DLA, has overall responsibility for negotiating, concluding, and amending international agreements for petroleum support. A stand-alone international agreement is usually negotiated by DLA Energy or a Service through the appropriate US embassy as authorized in DOD directive 5530.3, *International Agreements.*

Contracts and Agreements

A blanket purchase agreement should be considered for filling anticipated repetitive needs for supplies or services for a stated time period.

Into-plane/into-truck contracts are used for refueling military aircraft at commercial airports where military facilities or personnel are not available.

Bunker contracts have been established to provide propulsion fuel where US Government-owned stocks are not available.

Principles of Bulk Water Purification, Storage, and Distribution

As water requirements rise above individual or small unit needs, they need to be handled in "bulk" form.

Tactical bulk water-support operations are implemented to purify water as close to the user as possible. Bulk water support normally is a Service responsibility. However, during joint operations, the subordinate joint force commander may assign water-support responsibilities on an area basis.

Planning Guidance

Water support planning is a continual process beginning with the identification of the force size and planned deployment rate. Total water requirements are placed in the theater water distribution plan developed by the CCDR, with support from the Service component commander.

Consumption Requirements

Considerations for planning water consumption requirements include the region (tropical, arctic, temperate, or arid), infrastructure, personal hygiene, food preparation, laundering, centralized hygiene, hospitals, decontamination requirements, vehicle maintenance, mortuary affairs, aircraft washing tactical ice plant, refugee/detainee civilian internee/ and prisoner of war camps, and firefighting.

Water Support Operations

Considerations for water support operations include: water purification, water storage, and water distribution.

CONCLUSION

This publication provides fundamental principles and guidance for providing bulk petroleum and water in support of joint operations.

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CHAPTER I
JOINT BULK PETROLEUM OVERVIEW

"There is nothing more common than to find considerations of supply affecting the strategic lines of a campaign and a war."

Carl von Clausewitz, Prussian General and Military Strategist (1780-1831)

1. Introduction

a. The distribution and storing of bulk petroleum presents a significant logistical challenge to the joint force. In this publication, all references to petroleum include not only the naturally derived product, but also alternative/renewable and synthetic fuels and their blends. **Providing forces with the right fuel, in the right place, and at the right time** requires planning to determine peacetime and wartime requirements, contract and allocate product, arrange for bulk storage, move products forward to and within the theater, ensure quality control, issue and account for the fuel, and maintain distribution equipment and facilities.

b. International concerns and agreements about air pollution and its effects on the environment precipitated significant changes in laws governing fuel specifications and engine emission standards among all industrialized nations. Within the United States, military equipment and fuels are exempt from several laws and regulations. However, statutes governing the public and commercial sectors directly impact the Department of Defense's (DOD's) requirements to meet engine design and gasoline specifications that require unleaded gasoline and ultra-low sulfur diesel. The collective impact of these statutory and regulatory changes could affect DOD's ability to achieve broad application of the single-fuel concept (SFC) as experienced in recent operations.

2. Concept of Joint Bulk Petroleum Operations

Providing the right fuel at the right place at the right time is a key logistics consideration. Bulk petroleum support to joint operations requires the Services to develop complementary tactical distribution systems and trained personnel to meet combatant command (CCMD) requirements while the Defense Logistics Agency (DLA) is required to provide fuel to all Service component missions. The nature of joint bulk petroleum support will vary depending on the theater environment, capabilities, and whether force employment is single-Service, joint, or multinational.

3. Principles of Joint Bulk Petroleum

Bulk petroleum requires special handling and storage and has a demand significantly larger than other supply classes. For these reasons, any viable support concept should incorporate the principles of standardization, flexibility, and interoperability.

a. **Standardization.** DOD components should minimize the types of bulk petroleum products that must be stocked and distributed, plan to use fuels readily

available worldwide, and minimize the military-unique characteristics of DOD fuels. Limiting military-unique characteristics allows the use of kerosene-based products for land-based forces, and potentially increases operational flexibility, because these kerosene-based fuels are commercially available worldwide. Joint force commanders (JFCs) should minimize unnecessary fuel type usage when planning for contingencies. The DOD *Energy for the Warfighter: Operational Energy Strategy* has been issued with the intent to bring broad-ranging changes in the way joint forces employ energy, water and waste management resources towards increased combat effectiveness/readiness. SFC is effective and has several benefits; one fuel is considerably easier to manage than multiple fuels, allowing the functions of fuel storage, transportation, and distribution to be tailored for maximum efficiency. Using JP8 [jet propulsion fuel, type 8] or commercial jet fuel with additives as the single fuel has enhanced long-term storage stability, improved cold weather vehicle operation, reduced engine-combustion component wear, and reduced fuel-system corrosion problems. In addition, using a single fuel lessens the possibility of dispensing the wrong fuel and increases efficiency.

b. **Flexibility.** In operational environments that might not support single-fuel operations, forces need to have equipment that can operate with available products. Military systems and support equipment capable of using alternate fuels, provide the JFC with opportunities to increase storage and distribution efficiency while reducing cost, including the demands for security (threat or environmental based). Commercial fuels are more readily available and should be considered to increase supply chain velocity.

c. **Interoperability.** Interoperable fuel-handling equipment and connectors between components; and, when possible, multinational forces (MNFs); allow for more timely distribution and support with greater efficiency, including a reduction in the number of deployed systems operating within the theater. It is also important in multinational operations, where one nation may be designated as the role specialist nation for petroleum logistics. Consequently, to foster interoperability, DOD fuel-handling equipment must be of common or compatible design, material, and size.

PETROLEUM INTEROPERABILITY

"During Operation DESERT SHIELD, the most difficult part of the early petroleum resupply effort was the actual offloading of fuel from commercial tank trucks. Because the fittings that attached hoses to the trucks were not standardized, we needed special couplings to mate US equipment with Saudi commercial trucks. A similar problem had been resolved in Europe, but the fitting used there would not work in Saudi Arabia. During the early days, a field-expedient procedure was necessary to offload fuel from tankers. Finally, a prototype coupling was assembled. This coupling was purchased locally in sufficient quantities to cover a few early requirements."

Logistics Planning for Desert Storm, *Army Logistician*, January–February 1991

4. Joint Bulk Petroleum Logistics

The component commands determine bulk petroleum requirements for submission to the combatant commander's (CCDR's) joint petroleum office (JPO) or subarea petroleum office (SAPO). The JPO or SAPO consolidates and validates the bulk petroleum requirements for planning and support purposes and provides them to DLA Energy for sourcing, analysis, and development of a support plan in accordance with (IAW) the Adaptive Planning and Execution System. DLA, as the executive agent (EA) for bulk petroleum, shall provide planning products in support of the CCDR's operation plans (OPLANs) and concept plans (CONPLANs). The concept of operations (CONOPS) for contingency, sourcing analysis of planned time-phased contingency requirements, and logistics supportability analysis (LSA) outlines the risks and feasibility of support from the industry supplier base and incorporates DLA Energy's capabilities.

5. Bulk Petroleum in the Joint Logistics Environment

a. **Strategic Level.** The combination of Service, agency, and industry constitutes the backbone of joint bulk petroleum logistics, which aid in the projection and long-term sustainment of the CCDR's joint bulk petroleum requirements. The strategic level emphasis is on utilizing the industrial base to enhance the CCDR's capabilities through leveraging of strategic resources.

b. **Operational Level.** The joint bulk petroleum logistician integrates strategic and tactical capabilities of the joint forces to meet the CCMD's operational requirements. The joint bulk petroleum logistician encounters the greatest challenges at this level because of the difficulty in integrating the capabilities from many providers who must project, distribute, and sustain bulk petroleum for the JFC.

c. Global providers such as the Services, host nation (HN) commercial partners, United States Transportation Command (USTRANSCOM), and DLA are critical components at the operational level. The Services, working with their components, provide the necessary force structure (personnel and equipment) to organize, train, and equip bulk petroleum support forces at the operational level. Department of Defense Directive (DODD) 4140.25, *DOD Management Policy for Energy Commodities and Related Services,* provides the policy basis for Service-specific bulk petroleum support. The United States Navy (USN) provides seaward and over-water bulk petroleum support to the high-water mark; the United States Army (USA) provides overland distribution of bulk petroleum support, including inland waterways; and the United States Air Force (USAF) provides distribution of bulk petroleum by air.

d. **Tactical Level.** The responsibility to install and operate tactical petroleum storage and distribution systems usually lies with the Services. The Services derive their sustainment primarily from the strategic and operational levels for bulk petroleum operations and leverage the benefits of that sustainment to permit freedom of action. The joint bulk petroleum logistician contributes to joint force readiness by applying the three imperative capabilities to influence mission success: unity of effort, joint logistics enterprise (JLEnt) visibility, and rapid and precise response. The ability to deliver

sustained readiness can be viewed in the context of the integrating functions of planning, executing, and managing within the joint logistics environment. The framework for bulk petroleum support within the joint logistics environment is characterized by Figure I-1.

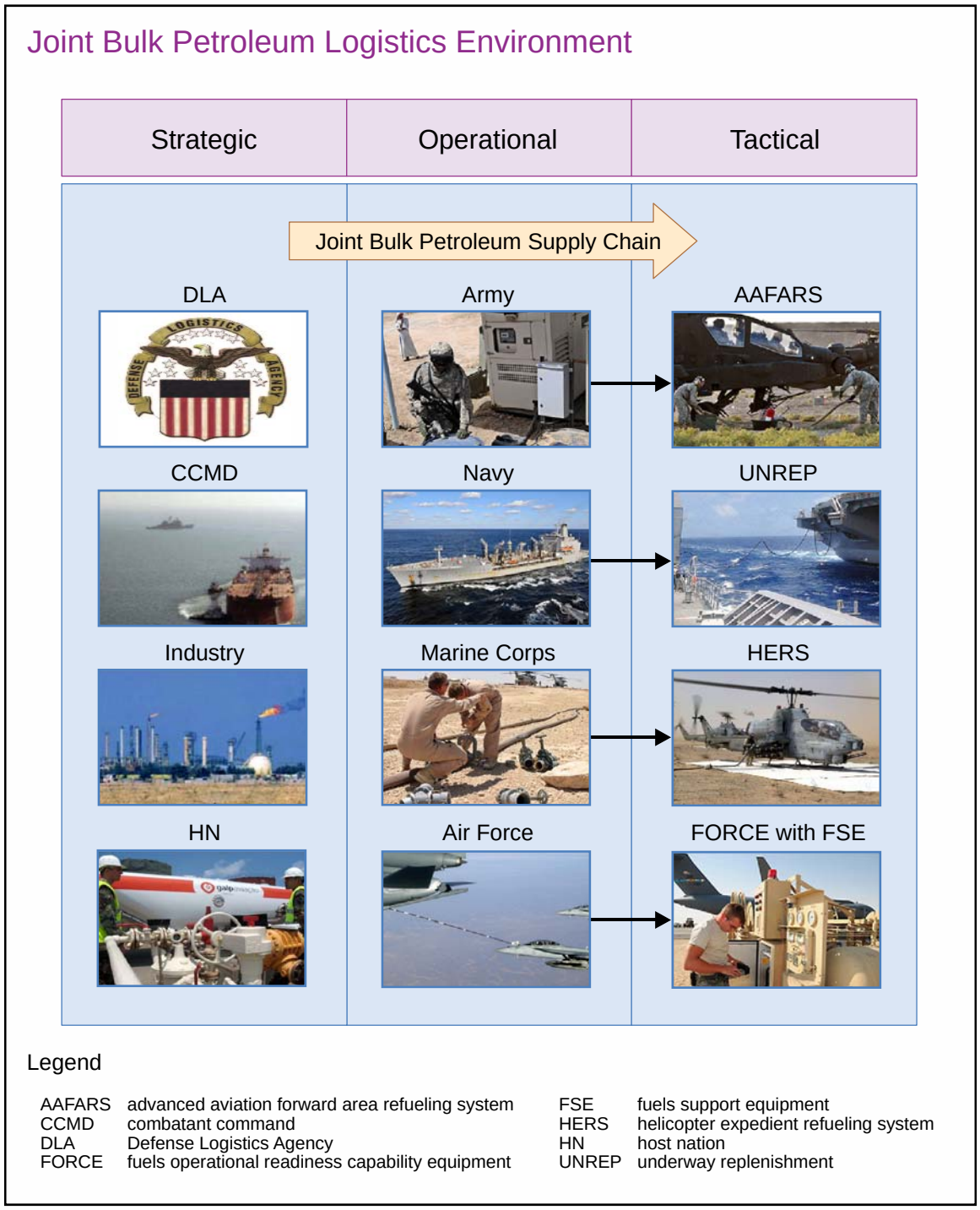

Figure I-1. Joint Bulk Petroleum Logistics Environment

CHAPTER II
JOINT BULK PETROLEUM RESPONSIBILITIES

"The pipeline constructed to support Operation IRAQI FREEDOM is the longest operational IPDS [inland petroleum distribution system] tactical fuel pipeline the Army has ever constructed. It is longer and moved more fuel than any previous IPDS pipeline. To construct it, more than 1,300 twenty-foot ISO [International Organization for Standardization] containers were transported and more than 1,500 soldiers were required to build and operate it."

To Support Operation IRAQI FREEDOM, *Pipeline & Gas Journal,* January 2004

1. Introduction

a. Joint bulk petroleum organizations enable safe and effective operations through the supply chain process. Efficient bulk petroleum supply and distribution operations increase the velocity at which the warfighter is supported. Properly accounting for and reporting bulk fuel inventories enable sound senior leader decisions during operations. Support agencies need to ensure that the fuel meets military specifications while following strict guidelines to safeguard against environmental contamination. When supply chains are not able to meet requirements, suppliers need to have robust contracting and international agreements in place to overcome these support gaps. In smaller-scale operations, Army-led Service bulk petroleum support may come from tactical-level units, such as sustainment brigade, rather than a theater sustainment command (TSC).

b. DODD 4140.25, *DOD Management Policy for Energy Commodities and Related Services*, provides overarching policy and responsibilities. IAW DODD 5101.8, *DOD Executive Agent (EA) for Bulk Petroleum*, DLA is designated as the EA for bulk petroleum and has delegated execution responsibilities to DLA Energy.

2. Bulk Petroleum Supply and Distribution Operations

a. DLA Energy supports bulk petroleum supply and distribution operations by exercising management responsibilities for consolidation and review of requirements, procurement, funding, budgeting, storage, and designated distribution of bulk petroleum to meet operational requirements. DLA Energy exercises responsibilities for the ownership of bulk petroleum in non-tactical bulk storage through sustainment, restoration, and modernization (SRM) funding for Service bulk petroleum storage and distribution facilities. SRM is the facility asset program designed to sustain, restore, and modernize fuel facilities for the warfighter. The corresponding JPO should coordinate SRM actions and military construction (MILCON) affecting their area of responsibility (AOR) to ensure synchronization with contingency planning.

b. Many organizations have, or are currently developing, computer-based common operational pictures (COPs) for situational awareness. COPs can provide an effective tool for decision making at all levels of the organization. The graphical description (see Figure II-1) depicts the operational elements, organizations, and units that are required to

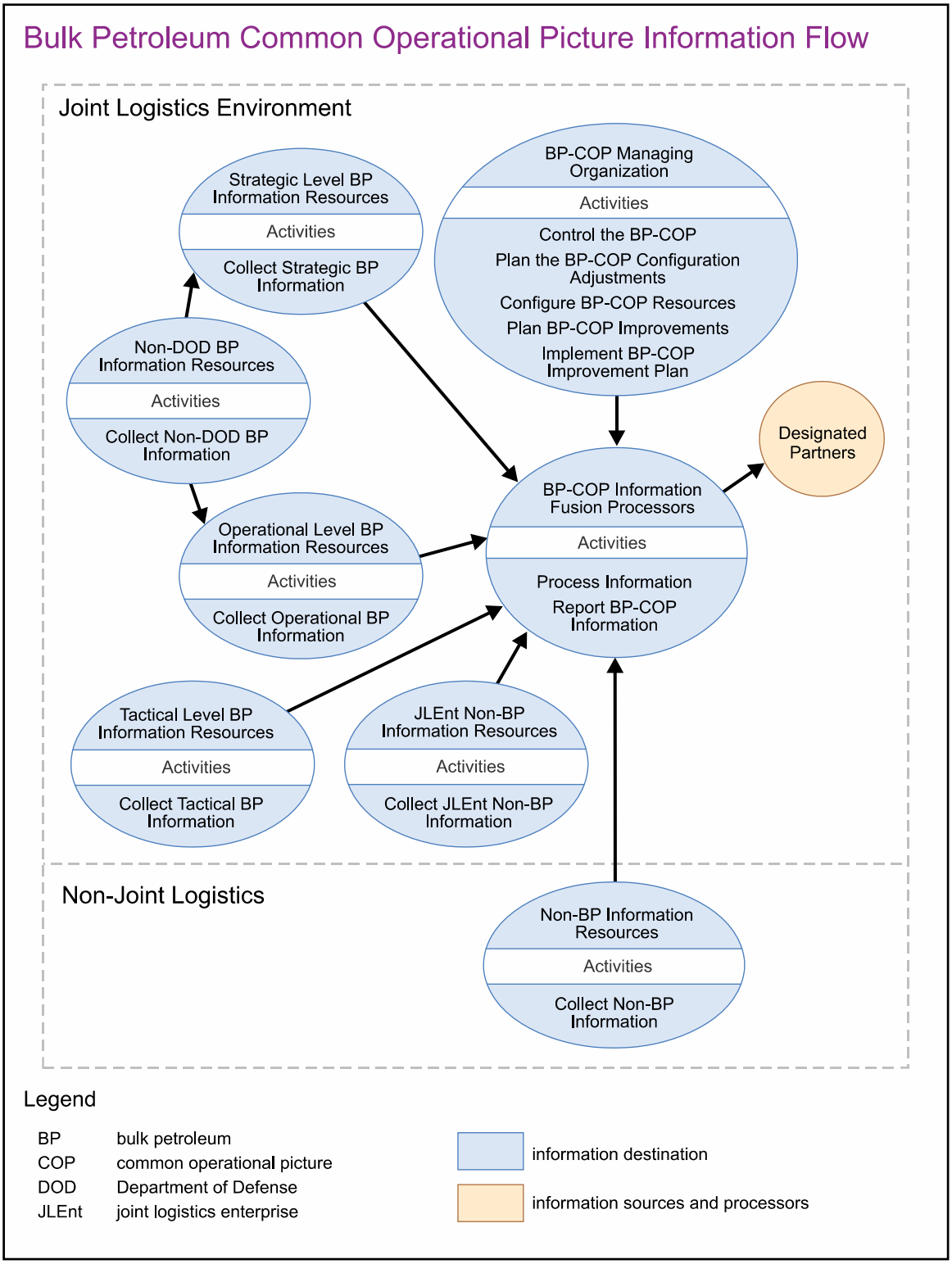

Figure II-1. Bulk Petroleum Common Operational Picture Information Flow

exchange information directly with each other, and the types of information they exchange. This figure also depicts the need to exchange information from one operational node to another; however, it does not show the connectivity between them.

c. The notional bulk petroleum COP information node diagram displays the strategic, operational, and tactical sources of bulk petroleum information; the sources of non-bulk petroleum information such as geographic and weather data; and the flow of each type of information to the bulk petroleum COP processing center. It also shows that the processed information is made available for subsequent distribution to approved stakeholders.

d. The modern world is highly dependent upon petroleum products; therefore, it is likely that some infrastructure would be available for use by US forces almost anywhere in the world. However, it is entirely likely, depending on the size of the operation, that sufficient fuel product and infrastructure would not exist to support planned operations; therefore, tactical systems may be required to supplement infrastructure available in the theater.

e. Bulk petroleum may need to be received via joint logistics over-the-shore (JLOTS) operations. Such operations use an offshore petroleum discharge system (OPDS) or other bulk liquids transfer system to deliver fuel to tactical storage facilities located immediately ashore. The offshore system delivers fuel to a tactical or commercial terminal, normally operated by a petroleum pipeline and terminal operating company. Fuel may then be moved forward through the use of trucks, rail, or installed pipeline systems that can quickly establish inland product distribution. If the theater is not an active theater of war, it should have an established operating stocks (OS) level and pre-positioned war reserve stock (PWRS). The USA manages overland petroleum distribution support.

3. Web-Based Petroleum Contingency Report

a. The JPOs, at the direction of the Chairman of the Joint Chiefs of Staff, submit two key joint petroleum reports: bulk petroleum contingency report (REPOL) and bulk petroleum capabilities report (POLCAP). Information on frequency and how to complete these reports is outlined in Chairman of the Joint Chiefs of Staff Manual (CJCSM) 3150.14, *Joint Reporting Structure—Logistics.*

b. The REPOL provides the Joint Staff, Services, and DLA Energy with summary information on bulk petroleum inventories, a damage assessment for bulk petroleum distribution systems, and other strategic information pertaining to bulk petroleum support posture at specific bases, posts, locations, and/or forward operating bases. During contingencies, a REPOL can be submitted as frequently as daily. The JPO or SAPO consolidates the information to develop the REPOL for submission to the Joint Staff and supporting CCDRs using the Joint Chiefs of Staff Web-based REPOL application.

c. The POLCAP provides the Joint Staff, Services, and DLA Energy with an assessment of bulk petroleum support capabilities for contingency requirements in a specific theater.

d. The JPO or SAPO develops a theater-unique version of the POLCAP and REPOL for their respective Service components and supporting DLA Energy regional

office to use when reporting essential theater bulk petroleum information. They also publish the POLCAP and REPOL reporting instructions per their respective CCDR's logistic reporting directives.

4. Bulk Petroleum Quality Management

a. The two main functional areas of quality management are quality assurance (QA) and quality surveillance (QS). Contract provisions detail the quality requirements for commercial suppliers, while DOD 4140.25-M, *DOD Management of Bulk Petroleum Products, Natural Gas, and Coal Acquisition and Technology*, and the Military Standard (MIL-STD)-3004, *Quality Assurance/Surveillance for Fuels, Lubricants, and Related Products*, prescribe the quality management requirements for QA and QS performed by the government. With reference to these publications, QA covers the life cycle quality management requirements. Contract QA focuses on assuring product and service compliance of a contractor. QS is the follow-on of QA. Once received from the contractor, QS focuses on assuring government-owned product and services being received, stored, and issued from a supply point.

Quality Assurance (QA)—A system of activities, the purpose of which is to provide to the producer and user of a product, measurement or service the assurance that it meets the defined standards of quality with a stated level of confidence and includes quality planning and quality control. A planned and systematic pattern of all actions necessary to ensure that adequate technical requirements are established; that products, quantity accountability, and services conform to these established technical requirements; and that satisfactory performance is achieved. It includes: quality planning during specification development and review, quality support to contracting and acquisition teams, quality oversight of product and service providers to assure compliance to contracts and agreements, quality control operations for products and services incoming or in the US Government supply chain, and quantity measurement and control activities. Contract QA is a method the US Government uses to determine if products and/or services that a supplier provided fulfilled its contractual obligations and included all actions required to ensure compliance to contractual or agreement terms and conditions. Generically, the term QA refers to all processes and procedures encompassing quality planning/development, QA, quality surveillance, and quality control.

Quality Surveillance—a subset of QA encompassing the program of inspections, sampling, testing, quantity measurement and control and documentation established to monitor the quality/quantity of product being received, stored and issued within the US Government supply chain.

Military-Standard-3004, Quality Assurance/Surveillance for Fuels, Lubricants, and Related Products

b. All providers and users of bulk petroleum have a vested interest in quality management and must work closely together to provide the capability needed. Planning for bulk petroleum support should be fully accounted for in OPLANs and operations orders (OPORDs), particularly activities involving storage and distribution. These activities should be designed around all available quality management assets from contract to customer support, including tactical petroleum laboratories and kits. Execution of bulk petroleum support requires a high level of diligence across all operations, including those involving captured petroleum stocks that can be used by friendly forces in joint operations. The control of bulk petroleum quality management in the JLEnt involves the coordination of many civil, commercial, and military assets overlapping several lines of command and authority.

c. Sediment and water are the most common types of contaminants found in storage, distribution, and dispensing systems. Their presence can cause serious problems in fuel systems, particularly in aircraft. Positive action must be taken to prevent and eliminate the occurrence of these contaminants in bulk products. DLA Energy and Service components must plan and ensure trained bulk petroleum quality personnel and equipment are available to ensure contingency petroleum stocks meet military requirements. QA ensures that suppliers have fulfilled their contract obligations and that the government is receiving the proper quantity and quality of specified bulk petroleum. Petroleum contract QA is fulfilled when the product has been accepted by the government and becomes government-owned. Petroleum QS is an aggregate of measures applied to determine and maintain the quality of government-owned petroleum and related products so such products are suitable for their intended use. QS of bulk products begins during receiving operations and continues as long as the products are in the physical possession of the government and until consumed.

5. Fuel Safety

Health and safety are principal concerns. Petroleum products are hazardous due to their toxicity, explosiveness, flammability, and potential to create environmental damage. Prescribed health and safety precautions will be strictly followed for the protection of personnel, equipment, and the environment. Fire hazards are possible whenever petroleum products are handled, due to leaks, spills, vapor accumulation, improper grounding or bonding, or proximity of any heat source. Some of the key chemical properties of fuel and fuel additives that should be of interest to users are contained in MIL-STD-3004, *Quality Assurance/Surveillance for Fuels, Lubricants, and Related Products.*

6. Environmental Concerns

a. All US military activities are required to conform to US environmental laws and guidelines as set forth in DOD issuances. Additionally, these activities must comply with all applicable state and local laws, rules, and ordinances, unless a waiver has been obtained from the appropriate authority.

b. Leaks or spills must be avoided to prevent the discharge of petroleum products to waterways and underground water tables. Code of Federal Regulations, Title 40, Part 112.7, *General Requirements for Spill Prevention, Control, and Countermeasure Plans,* provides guidance on establishing a spill prevention and control plan.

c. For activities and facilities at enduring locations outside the United States, follow applicable international agreements and the appropriate country-specific final governing standards (FGSs) developed IAW Department of Defense Instruction (DODI) 4715.05, *Environmental Compliance at Installations Outside the United States.* In countries where no FGS exist, follow applicable international agreements and DOD 4715.05-G, *Overseas Environmental Baseline Guidance Document.*

(1) Follow HN environmental laws (when applicable), North Atlantic Treaty Organization environmental standardization agreements, and regulations to the extent required by relevant status-of-forces agreements or other international agreements.

(2) Adhere to HN environmental requirements reflected in country-specific FGSs.

(3) Where FGS are not in place, apply DODI 4715.05, *Environmental Compliance at Installations Outside the United States,* when HN environmental laws do not exist, are not applicable, or provide less protection to human health and the natural environment.

(4) Seek legal advice regarding the applicability of HN environmental laws or other US federal standards in contingency operations.

For additional information on environmental concerns, see DODI 4715.05, Environmental Compliance at Installations Outside the United States, and DLA Energy Environmental Guide for Fuel Terminals.

7. Petroleum Operational Contract Support and International Logistics Acquisition Agreements

a. DLA Energy has responsibility for the centralized procurement of bulk petroleum for DOD. The contracting officer is the DLA Energy point of contact for questions and concerns regarding contract award or administration and may appoint a contracting officer representative (COR) to assist with administrative or quality issues. The scope and limits on the COR responsibilities are defined in the appointment documents.

b. DOD components submit requests to the geographic combatant commander's (GCC's) JPO for validation and obtain DLA Energy authority to locally purchase petroleum products in excess of the annual limits described in DOD 4140.25-M, *DOD Management of Bulk Petroleum Products, Natural Gas, and Coal Acquisition and Technology.* The contracting officers will respond with the information required in order to approve the request. However, in the case of bulk petroleum, requests are submitted through the service control point (SCP), who validates the request and then

forwards it to the DLA Energy for approval. If a DOD component is not supported by a DLA Energy contracting officer, it should send all requests through the cognizant SCP or DLA Energy duty officer.

c. **Into-Plane Contracts.** DLA Energy into-plane contracts allow government aircraft from military and federal civilian agencies to purchase fuel and refueling services at commercial airports at substantial discounts from the posted airport price. The Services send requests for into-plane contracts through the CCMD JPO for validation to DLA Energy. However, the Services may use an Aviation Into-Plane Reimbursement Card without requesting DLA Energy authorization when the commercial airport lacks any DLA Energy into-plane contract coverage.

d. **Emergency Requirements.** When requirements prohibit time to obtain a DLA Energy contract through normal procurement channels, the user determines the need for emergency procurement. Emergency procurement should cover only the amount calculated to sustain immediate operational needs and until normal contracting channels are secured. For work stoppages, local purchase is limited to immediate use quantity. A copy of the local purchase procurement documents is mailed to DLA Energy with the annotation: “Local purchase of a DLA-integrated managed item.”

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CHAPTER III
PLANNING FOR JOINT BULK PETROLEUM OPERATIONS

"By reducing the need for petroleum-based fuels, we can decrease the frequency of logistics convoys on the road, thereby reducing the danger to our Marines, Soldiers, and Sailors."

Lieutenant General Richard Zilmer, United States Marine Corps,
Commanding General, Multi-National Force West,
Iraq July 2006, Urgent Operational Need Statement

1. Introduction

The JPO conducts the overall planning of petroleum logistic support for their CCMD. This planning occurs at the strategic and operational levels and is usually embodied in appendix 1 (Petroleum, Oils, and Lubricants [POL] Supply) to annex D (Logistics) of the OPLANs or CONPLANs. The appendix covers theater-wide fuel requirements, resupply, and distribution. The format for fuels planning is prescribed in CJCSM 3130.03, *Adaptive Planning and Execution (APEX) Planning Formats and Guidance.* The DLA Energy regional offices and Service components support the JPO in developing a practical, sustainable petroleum support concept and plan.

For more information, see Appendix A, "Planning Guidance for Appendix 1 to Annex D, Bulk Petroleum Supply for Military Plans."

2. Joint Bulk Petroleum Operation Planning

a. Utilizing the joint operation planning process, logisticians responsible for supporting bulk petroleum within the JLEnt assemble an array of tools to assist with support planning for the projection, distribution, and sustainment of joint forces.

b. The LSA provides a broad assessment of key logistics capability areas required to execute the CCDR's plans. The LSA is a critical plan assessment tool that seeks to measure the total unconstrained logistics requirement against available logistics enablers for the execution of a CONOPS. The LSA findings should highlight logistics deficiencies and their associated risks to support theater operations. Additional tools are the integrated consumable item support (ICIS) system, operation-logistic planners, and other planning documents such as the Global Petroleum Distribution Plan.

c. Joint bulk petroleum plan development involves meticulous attention to the ability of global partners to provide bulk petroleum assets to the theater. The scope of this planning is widespread and involves the ability of contracting partners and HNs to complement the global partners' strategic capabilities as seen in Figure III-1. Plan development must also integrate the availability of secure lines of communications (LOCs), the intensity of current and future operations, and the organizational structure of the JFC. Whether through deliberate or crisis action planning, the joint bulk petroleum planner should have the capability to call upon the vast information resources available

Required Actions When Planning for Bulk Petroleum Operations

- Project accurate, timely fuel requirements.
- Maximize use of in-country civilian or host nation support fuel facilities.
- Tailor fuel equipment and support packages to the requirement.
- Standardize and ensure compatibility of fuel equipment to support joint and multinational fuel operations.
- Establish the theater joint petroleum office or subarea petroleum office with assistance provided by Defense Logistics Agency Energy regional offices and Service components.

Figure III-1. Required Actions When Planning for Bulk Petroleum Operations

across all operational levels. The collection of data from disparate information systems is essential to garner accurate assumptions and substantiated facts for planning processes.

d. A fundamental tenet to successful planning for bulk petroleum support is the early and accurate identification of requirements enhanced by the joint bulk petroleum planner's complete understanding of the commander's intent and CONOPS. This critical knowledge will enhance the ability to direct available bulk petroleum resources to support the joint force and allow for greater flexibility in execution. The more integrated the logistics planning is with the development of the CONOPS and the commander's intent, the more effective the overall operational execution.

e. One critical aspect of joint bulk petroleum planning is the infrastructure where the operation will be conducted. Some theaters will have HN assets available, such as pipelines, storage facilities, and railways, that will help support the bulk petroleum distribution system. In these situations, airbases, tactical airfields, and other sites can be supported by pipelines whenever tactically feasible. In other theaters, HN or commercial bulk petroleum facilities may not be available and tactical assets will need to be used. Tactical bulk petroleum supply systems may include limited tanker mooring systems, floating hose lines, underwater pipelines, inland tank farms, temporary overland hose lines or pipelines, collapsible tanks, and tanker trucks.

f. Within the planning process, the inventory management plan (IMP) is an important document that is validated and issued annually by DLA Energy in concert with the CCMDs and Services. The IMP identifies the petroleum inventory levels needed to support OS requirements and pre-positioned war reserve requirements (PWRR) and specifies the amount of petroleum product, by location, held to cover requirements. These two categories of inventory guide the sizing of the stock levels to permit

immediate and short-term operations. Their purpose is to sustain such operations until resupply can occur. Because of storage limitations, one CCDR may cover the requirements of another CCDR's OPLANs with concurrence of the supported CCDR's JPO. Although not desirable, this practice is allowed when products can be delivered within the required joint OPLANs timeframe and before normal commercial resupply can be made to a stockage location. To the extent practicable, and consistent with acceptable risk, stocks are positioned at or near the point of intended use. When possible, stocks are dispersed and held in conventional hardened facilities in high-threat areas. DLA plans for war reserve storage are coordinated with the CCMDs and the Joint Staff JPO and may be consistent with host-nation support (HNS) programs.

g. To ensure an adequate supply of petroleum products in the initial phases of a contingency, the CCMDs and Services develop requirements to properly size PWRS. The PWRR are based on the need to support specific joint operations until normal LOCs are established. Biennially, the Joint Staff, in coordination with DLA Energy, develops guidelines, approved by the Office of the Secretary of Defense (OSD), on days of supply (DOS) and appropriate assumptions for secure sources of resupply.

(1) PWRR for campaign plan or OPLAN. PWRR is the CCDR's war reserve fuel required to support a campaign or operation as outlined in the CCDR's campaign plan, OPLAN, or OPORD. The requirement is determined by applying operational tempo and fuel consumption rates to all the deployed weapon systems in the campaign or operation. The Global Petroleum Distribution Plan should be considered when determining stockage location. The Joint Staff (JS), J-4 [Logistics Directorate], publishes this plan, which establishes recommendations for petroleum support.

(2) ICIS is available to assist the joint logistics planner. ICIS develops PWRR by using the CCDR's time-phased force and deployment data (TPFDD) and applying Service consumption data in order to produce detailed time-phased requirements. Each Service should validate the ICIS consumption factors periodically (recommend annually) to ensure that platform and consumption factors are included in the annual PWRR computation. ICIS output, coupled with Joint Flow and Analysis System for Transportation, is used to develop a sealift tanker delivery slate in the form of non-unit TPFDD records. The ICIS force deployment module allows direct entry of forces into the module for crisis action and exercise planning when a TPFDD is not available.

h. The PWRS are the on-hand products designated to satisfy the PWRR. They consist of stocks to support deployment and combat operations, and are sized to meet requirements until resupply can be affected from a secure source. Sourcing assumptions and PWRS DOS factors are developed by the Chairman of the Joint Chiefs of Staff and forwarded to OSD for approval.

(1) **Establishment.** PWRS is based on the most demanding operational plan requirement for each location and is in addition to OS for each location. The CCDR's JPOs are authorized to release or reallocate PWRS in emergency situations.

(2) **Types of PWRS**

(a) Starter stocks are war reserve materiel located in or near a theater of operations to support the conduct of military operations until resupply at wartime rates can be established, or until the contingency ends, whichever occurs sooner. OSD's DOS guidance is utilized to compute the appropriate PWRS for a geographic location.

(b) Swing stocks are positioned afloat or ashore and are capable of supporting the requirements of more than one contingency in more than one theater of operations. Swing stock guidance and positioning is recommended by the Global Petroleum Distribution Plan and through collaboration between JS J-4 JPO and affected CCMD JPOs.

i. The GCCs, with recommendations from the responsible Service component, prescribe the location, level of protection, and security of PWRS.

j. OS are the amount of product required to sustain peacetime operations in support of military demands. The fuel OS levels are computed annually by DLA Energy for all defense fuel support points and utilize the factors depicted in Figure III-2.

k. **Joint Bulk Petroleum Inventory.** Bulk petroleum inventory consists of PWRS and OS. Both inventories are sized, based on a concept of having enough fuel on hand until resupply can be assured. PWRS shall be in addition to OS and are designated as starter or swing stocks or both. See IAW DODI 3110.06, *War Reserve Materiel (WRM) Policy*. This approach optimizes stock levels to maintain an acceptable degree of support and sustainability across the range of military operations. Inventory levels are independently determined for each location or, where practical, for a defined area.

Factors for Computing Operating Stocks

Daily Demand Rate – The past and projected years' issues are used to calculate a daily demand rate.

Economic Resupply Quantity – The fuel quantity a defense fuel support point can receive that ideally balances economic and operational requirements.

Safety Level – The safety level is the amount of fuel to compensate for variability in resupply time and demand during the resupply cycle.

Unobtainable Inventory – That fuel needed to prime a storage dispensing system such as pipeline fill, manifold fill, and tank bottom below the suction line.

Figure III-2. Factors for Computing Operating Stocks

l. **Emergency Allocation of Petroleum.** Various levels of responsibility govern the allocation of fuel during a national emergency. These responsibilities are dependent on the theater and worldwide commercial environment. Based upon the CCDR's guidance, the JPO will direct the allocation of petroleum products. This allocation will include using PWRS to meet peacetime operations. Actions taken are coordinated with DLA Energy. DLA Energy is responsible for providing the CCDR with the needed information on the overall fuel situation and efforts under way to overcome deficiencies.

m. If the Services or the CCMDs are not satisfied with the allocation of products by DLA Energy during constrained fuel availability, they may request the activation of the Joint Materiel Priorities and Allocation Board (JMPAB). The JMPAB, which acts for the Chairman of the Joint Chiefs of Staff in all petroleum allocation matters, will be established during extreme situations, such as worldwide fuel shortages, resulting in ultimate supply failure or in unacceptable degradation of wartime sustainability. Specific information that the Service or CCMDs provide to the JMPAB includes current inventories, resupply forecasts, and impacts on both peacetime and wartime operations.

n. The prudent use of war gaming and exercises, either through simulation or other means, can be an important aid to identify gaps and clarify roles and responsibilities in bulk petroleum operational plans before they become problematic in execution. Modeling new concepts is a useful way to develop solutions without actual hostilities; however, the planner must be cognizant of depending too heavily on assumptions that would lead to flawed conclusions.

o. **Overall Theater Petroleum Support.** The inland petroleum distribution plan (IPDP), developed by the JPO or SAPO, provides a single source document for understanding how the guidance provided in the CONPLANs or OPLANs will be executed. It provides the details necessary for Service commanders to understand how to interface with units, agencies, and firms providing petroleum support.

p. Just as the JPO is responsible for theater petroleum planning, the SAPO is responsible for bulk petroleum planning and execution matters within its operational area. This level of planning focuses on support for each Service component. Its products are the IPDP and base support plans. The IPDP complements the intratheater and intertheater planning efforts of the JPO, and forms the tactical basis of the petroleum portion of the OPLANs and CONPLANs. The IPDP is published either as a tab to the appendix 1 (Petroleum, Oils, and Lubricants [POL] Supply) to annex D (Logistics) of the OPLANs or as a stand-alone document.

3. Bulk Petroleum Plan Development

a. The mission and the planned size and composition of the joint forces to be supported should be guiding parameters for planning efforts. Theater contingency scenarios, worldwide materiel distribution policies, and other guidance should be considered in determining specific theater requirements. CCDRs develop plans to minimize the types of fuels required in joint operations.

b. The following questions will aid in the development of the appendix 1 (Petroleum, Oils, and Lubricants [POL] Supply) to annex D (Logistics):

(1) Should a SAPO for resupplying bulk petroleum be established?

(2) What is the CONOPS for petroleum support?

(3) What HNS is available?

(4) What are the components' responsibilities for petroleum support? Have components provided estimates of their bulk petroleum requirements?

(5) Have arrangements been made to contract for HNS or theater support contractor resources with the supported CCMD JPO or DLA Energy?

(6) Have bulk petroleum storage methods and sites been selected? What is the threat level within the operational environment? Have security arrangements for the sites been established?

(7) Have arrangements been made for transportation of bulk petroleum within the assigned theater?

Appendix A, "Planning Guidance for Appendix 1 to Annex D, Bulk Petroleum Supply for Military Plans," provides additional planning guidance.

4. Joint Bulk Petroleum Logistics Planning Considerations

a. IAW DODI, 4140.25, *DOD Management Policy for Energy Commodities and Related Services,* DLA acquires, stores, and distributes bulk petroleum with associated fuel additives to all DOD component customers wherever and whenever it is needed across the full range of operational situations, with the goal of providing the appropriate fuel support for every weapon system. DLA coordinates with the DOD components on these matters when operational constraints may be implied. The petroleum supply system must be designed for the operations and climate of the specific theater. Some planning considerations for joint bulk petroleum logistics are listed in Figure III-3 and additional discussion on select considerations follows:

b. **Mission.** The mission and the planned size and composition of the joint forces to be supported should be guiding parameters for planning efforts. Theater contingency scenarios, worldwide materiel distribution policies, and other guidance should be considered in determining specific theater requirements.

c. **Joint Petroleum Logistics.** Joint petroleum logistics to support the deployment and employment of forces are determined by the Services. Service components of the CCMDs (or other organizations within each Service) use such factors as troop strength; numbers and types of aircraft, vehicles, or ships; deployment times; and intensity and duration of engagement to determine time-phased petroleum requirements. Plans should include these Service-generated requirements, all pre-positioned stocks, and sources for

Planning Considerations

- Mission
- Fuel Requirements
- Infrastructure
- Equipment
- Support Units
- Assumptions
- Command and Control Responsibilities
- Quality
- Interoperability of Fuel Transfer Systems
- Sustainability and Survivability
- Theater-Specific Factors
- Threat Environment
- Limiting Factors
- Sealift and Other Distribution Methods

Figure III-3. Planning Considerations

resupply. Accurate fuel requirement forecasting is critical to support the warfighter's mission. This includes considering the acquisition, transport, and storage of the requisite fuel additives through DLA Energy when commercial specification fuels are planned and used. Service headquarters (HQ) should ensure that bulk petroleum requirement planners have the training and resources to accomplish this task. The IMP, developed annually by DLA Energy in coordination with the Joint Staff, Services and CCMDs, details worldwide bulk PWRR and storage availability by location. The PWRR are sized by resupply sourcing assumptions included in the DOS factors, which are developed by the Joint Staff and approved by OSD. The Global Petroleum Distribution Plan should be considered when planning joint petroleum logistics.

d. **Infrastructure.** The capability of commercial and organic installations and facilities in the operational area to provide fuel, storage, distribution, and laboratories must be considered. Size, capability, and maintenance status of offshore unloading facilities, terminals, distribution points, and bases are important to the logistic feasibility of the fuel plan. Collecting this information can help determine the need for, and method of, employment of tactical terminals, pipelines, hose lines, and other fuel-handling equipment.

e. **Equipment.** To ensure that petroleum handling and distribution equipment is available for support of operations, fuel deployment packages and operational project stocks should be identified and considered for use. The USAF fuels operational readiness capability equipment (FORCE) and the USA inland petroleum distribution system (IPDS) are examples of such equipment. In addition, each Service's operating units for the specific petroleum handling systems should be linked to those systems and identified for movement in the plan. To increase efficiency, standardized and interoperable equipment should be considered for planning and execution.

f. **Support Units.** Timely arrival of engineer units (or logistics civil augmentation program contractors) for construction of petroleum facilities, and underwater construction teams and mission specialists for OPDS setup, are some of the diverse types of support units that must be identified. The type and arrival dates of units not tied to any specific equipment system, and needed for various support roles, also need to be identified.

g. **Interoperability of Fuel Transfer Systems.** Interoperability should be considered and resolved in the planning process for at least the following interfaces:

(1) Tanker or oiler to Navy receiving ship, United States Coast Guard receiving ship, seaport load and off-load facilities, and JLOTS systems.

(2) Airbase fuel storage and dispensing systems to receive fuel from commercial or military sources and issue fuel to Service component and multinational aircraft.

(3) Shore distribution systems to tactical fuel systems and equipment such as IPDS, amphibious assault fuel system, and fuel tanker vehicles.

(4) No system or set of systems should be planned to be utilized together without proper interoperability validation through the appropriate SCP.

h. **Limiting Factors.** Most plans will have some limiting factors such as lack of sufficient bulk petroleum storage in theater, inadequate transportation assets to support the supply chain, inexperienced force structure, limited fuel quantities, or nonexistence of commercial petroleum infrastructure in the operational area. Services have limited, or no additive injection capabilities. Any of these can quickly bring an operation to a halt and must be explicitly identified in the planning documents.

i. **Supply Chain Responsiveness Considerations.** Consideration must be given to supply chain specifics, such as how quickly refineries can produce product, how long it takes to deliver product, how much sustainment can be acquired from existing product inventories, whether new or additional contracting efforts are needed to sustain contingencies, and how US refinery contracting timelines compare to support rendered by other nations or agencies.

DEFENSE SCIENCE BOARD FINDING

"The task force found that in DOD [Department of Defense] combat simulation exercises, each military service emphasized mission execution while adequate fuel supplies were considered a constant. DSB [Defense Science Board] asserted that doing so left DOD unaware of the potential effects of fuel efficiency on combat operations and of the vulnerability of the fuel supply chain. Furthermore, with no model of efficient or inefficient fuel use, DOD could not analyze fuel related logistical requirements as part of the acquisition process."

Finding #4, Defense Science Board, February 2008

CHAPTER IV
EXECUTING JOINT BULK PETROLEUM OPERATIONS

"[Fuel, replacements, spare parts, etc.]…must be asked for in time by the front line, and the need for them must be anticipated in the rear."

General George S. Patton, US Army
***War as I Knew It*, 1947**

1. Introduction

a. DOD bulk petroleum inventories consist of PWRS and OS. These inventories exist to support logistic requirements and are sized to cover a range of military operations. They take into account economic resupply, safety levels, unobtainable inventory, and deliberate planning requirements. As such, they are created to provide optimal peacetime and contingency support.

b. Two key joint bulk petroleum reports are the REPOL and POLCAP. The details of these reports are described in Chapter II, "Joint Bulk Petroleum Responsibilities."

c. During execution, the bulk petroleum logistician must track key reports in the planning phase and review them in the execution phase. One of these key reports is the commander's critical information requirements. It provides the bulk petroleum logistician with the critical data the commander uses to measure success. Other key reports are friendly forces after-action reports; intelligence assessments; unit availability reports; intransit asset visibility; and HN and contracting partner capability reports.

d. As the execution phase continues to mature and eventually conclude, all or portions of the operation will cease, and forces and equipment will be reallocated or even moved out of the theater. It is important for the bulk petroleum logistician to maintain awareness of these operations to support their proper conclusion and to assist in the reallocation of bulk petroleum resources.

2. Joint Bulk Petroleum Logistics Execution

a. The established infrastructure within a theater supports the supply and distribution of bulk petroleum. Stocks are moved from secure military or commercial sources to forward areas and terminals, as demand or plans require. The movement and redistribution of assets are accomplished through a joint effort involving the CCMDs, Service components, and DLA Energy, interfacing with USTRANSCOM components for product movement outside the operational area. In the early stages, the theater infrastructure may consist of only a minimal amount of HN commercial or military infrastructure supplemented by assets of a Marine air-ground task force or Army support area. Land-based customers request fuel from the Army component TSC, or another Service component organization or agency assigned as the lead Service for bulk petroleum support. The TSC provides operational oversight for bulk petroleum and normally includes a petroleum and water branch. The expeditionary sustainment command Class III and water

LOGISTICS OPERATIONS CENTER

"The morning of the 16th [August 1990] began with our briefing by General Pagonis. Each person, based on his background, was given a subject area in which to work. I took the petroleum, water, and other general supply and maintenance functions. We calculated requirements on a day-to-day basis. This allowed other activities to take our basic calculations and organize them to meet their particular information needs. Since the fuel required for war would be vastly greater than for peacetime, we provided two fuel projections covering both of those alternatives."

Colonel John J. Carr, Starting From Scratch in Saudi Arabia, *Army Logistician*, January–February 1993

branch is tasked to manage and account for theater bulk petroleum. It also coordinates tactical petroleum operations and QS of bulk petroleum in the theater. These organizations schedule movement of product forward based on a combination of available storage capacity (ullage), distribution assets, and planned or requested customer demands. In all theaters, direct support units may provide fuel on an area basis to some or all forces comprising a joint force or MNF.

b. Actual procedures to accomplish the delivery of products to the end user depend on the sources of product and the conditions in the operational area. The theater normally has some HN assets available or theater support contracts (i.e., fuel sources, terminal facilities, pipelines, railways, and trucks) that should be used to the maximum extent possible to help offset US requirements. Because the capabilities of allies or coalition partners are theater unique, the JPO or SAPO is responsible for assessing these potential capabilities and integrating them into appropriate plans and operations. Figure IV-1 depicts normal land petroleum operations.

(1) **Pipeline and/or Hose-Line Distribution.** Pipelines are often the most economical and effective method of inland fuel distribution (e.g., the movement of bulk petroleum from base terminals and rear storage locations to the combat zone). A fully developed theater fuel distribution system may include ship discharge ports (with moorings and piping manifolds), seaside and inland fuel storage tanks, pump stations, and pipelines. Pipelines can be either the commercial-welded or coupled type or the military IPDS version. The rapidly installed type (hose-line or IPDS) is normally used for the initial phases of the operation while the more permanent commercial-welded pipe is used for later phases. Large-scale operations may justify the construction of coupled pipelines using the IPDS to move bulk petroleum forward from rear area storage locations, as illustrated in Figure IV-2. These lines may supplement existing Service or HN infrastructure pipelines. Airbases, intermediate staging bases, and operational locations deemed appropriate may also be serviced by pipeline systems when tactically feasible. The decision to deploy a tactical system should take into account the availability of resources to accomplish execution, sustainment, and security. Tactical pipeline systems require extensive commitment of resources for engineering, transportation, and security support that may be unavailable or better employed elsewhere. Hose lines may be used to service smaller or temporary, large-volume sites.

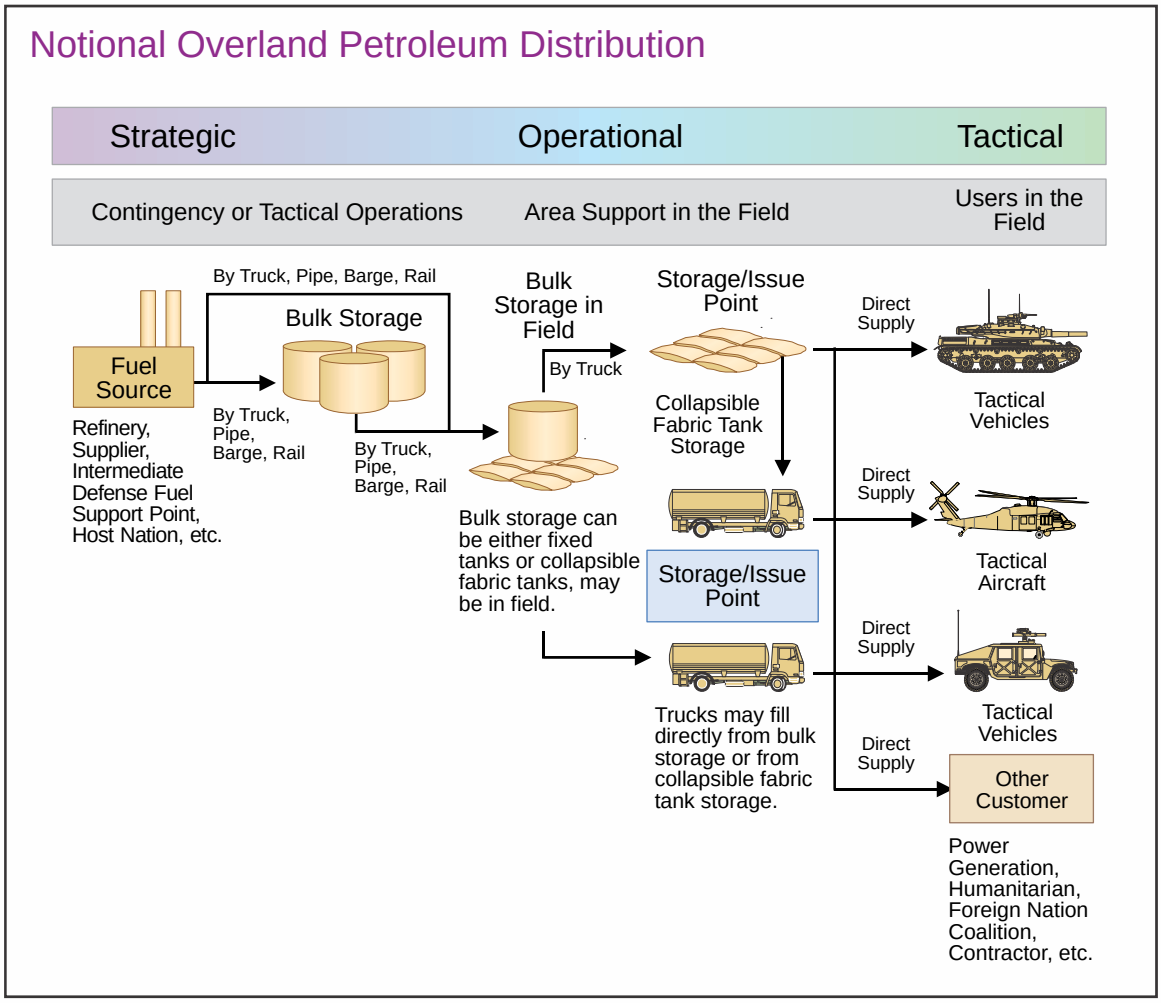

Figure IV-1. Notional Overland Petroleum Distribution

These tactical transfer systems can quickly establish inland distribution of bulk petroleum. The pipeline system extends as far forward as possible, with hose-line extensions into sustainment brigade storage sites. However, the tactical plan should be considered before committing to extensive use of pipelines.

(2) **Truck Distribution.** In many cases, truck distribution may offer the tactical commander more flexibility in the distribution of fuel. This distribution may be accomplished through use of military, commercial assets, or a combination of both.

(3) **Tactical Systems.** A tactical tank farm consisting of collapsible fabric tanks is constructed at airbases or other locations, and supplied/resupplied by a myriad of systems (e.g., hose line, pipeline, railcar tankers, or tanker trucks). The airbases or other locations then employ tactical servicing systems that have hoses, pumps, and filters to issue the product to the end user. These tactical issuing locations must also have the capability to test the fuel to ensure quality is maintained. In a theater, in-place and operational tankage, on-hand product, road networks, rail lines, and easily traversed LOCs are not normally available. Bulk petroleum may

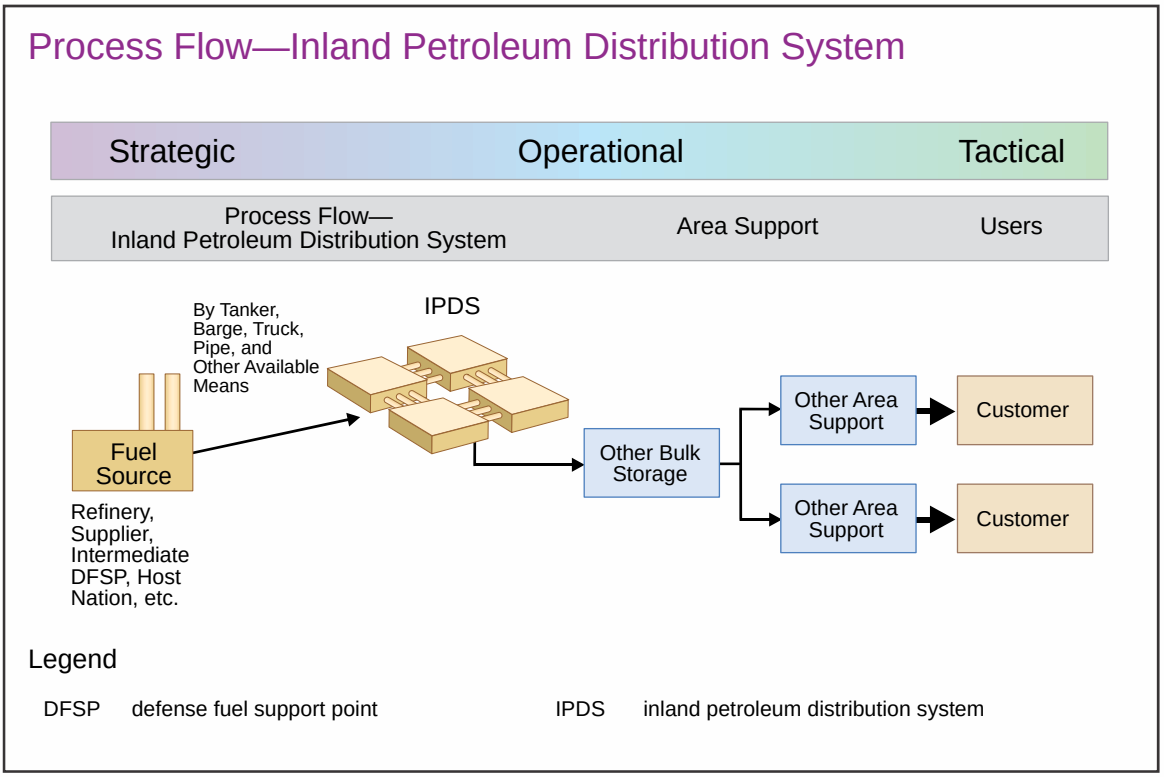

Figure IV-2. Process Flow—Inland Petroleum Distribution System

need to be received via JLOTS operations to deliver fuel to tactical storage facilities located immediately ashore. The OPDS delivers fuel to a tactical or commercial terminal normally operated by a tactical pipeline and terminal operating unit, as reflected in Figure IV-3.

Tanker trucks delivering fuel to forward locations.

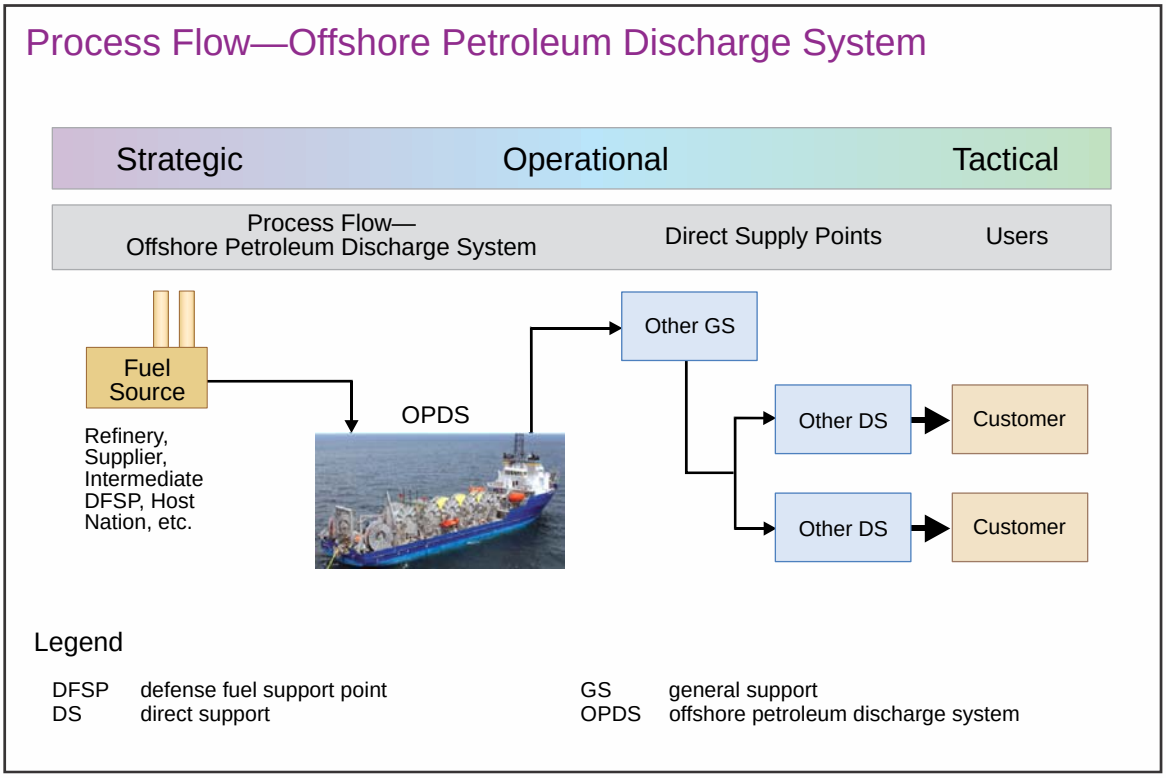

Figure IV-3. Process Flow—Offshore Petroleum Discharge System

(a) The heavy expanded mobile tactical trucks, petroleum tanker trailers, and the tank rack modules, are the primary means for distributing fuel in modular brigade combat teams and support brigades. These provide the ability to rapidly establish a fuel distribution and storage capability at any location regardless of the availability of construction equipment or material handling equipment.

(b) The fuel system supply point (FSSP) provides for tactical receipt, storage, and issue of bulk petroleum. The FSSP consists of pumping assemblies, filter separators, discharge and suction hose, valves and fittings, tank volume meter, fuel additive injection assembly, flow meter assembly, wet wing defueling assembly and spill kits. The FSSP is a specially assembled group of components designed to be used by forward area personnel and can receive and issue fuel to and from USA, USAF, United States Marine Corps (USMC) and USN systems. The 800 thousand (k) FSSP is stored in Army pre-positioned stocks for contingency operations. Additionally, the modular FSSP is fielded in three different configurations (120k, 300k and 800k) systems. Some configurations have slightly different capabilities and equipment.

(4) **Air Delivery.** When LOCs are not secure or when operating in noncontiguous areas, Service component aircraft carrying fuel trucks, collapsible tanks, 500-gallon collapsible drums, or 55-gallon drums may be required to distribute fuel. The aerial bulk fuel delivery system (ABFDS) enables cargo aircraft to transport fuel to the tactical storage and issue systems, however, ABFDS missions are not a cost effective or efficient means of providing fuel resupply in support of large operations. Delivery

Tactical storage in the theater of operations.

amounts vary based on aircraft type, configuration, and runway capability. The tactical fuel distribution systems are typically air transportable and consist of collapsible tanks, hoses, filters, and pumps. The supply chain utilizing ABFDS is depicted in Figure IV-4. In addition, tanker and cargo aircraft can deliver fuel to airbase tactical systems depending on runway capability and the threat. Wet-wing defueling is transferring fuel from fixed-wing aircraft fuel tanks to collapsible fabric tanks or tank semitrailers. This method of bulk petroleum resupply allows the aircraft to carry an internal load of dry cargo plus aviation turbine fuel without requiring additional aircraft to provide fuel support. Wet-wing defueling can supplement other bulk petroleum delivery systems. Aircraft used in these defueling operations include the C-5, C-130, C-17, KC-10, and KC-135. CH53E and MV-22 aircraft can also provide wet-wing defueling/rapid ground refueling. Transporting fuel by air greatly limits the airlift available for other requirements and is only used when other delivery means cannot meet operational needs. Transporting fuel by air greatly increases operational costs and safety risks.

(5) **Other Distribution.** The pipeline system may be supplemented by other means of bulk delivery such as barges, rail tank cars, aircraft, bulk truck transports, and commercial distribution equipment provided by the host. These distribution systems are used to move products from the rear or intermediate areas to the multi-Service direct support echelons. Bulk truck transports commonly move fuel from terminals or corps area storage to the Service component direct support unit (i.e., petroleum support companies for the USA, bulk fuel companies for the USMC, base fuels flights for the USAF, and construction force units for the USN). Direct support units may be tasked to provide retail operations on an area support basis.

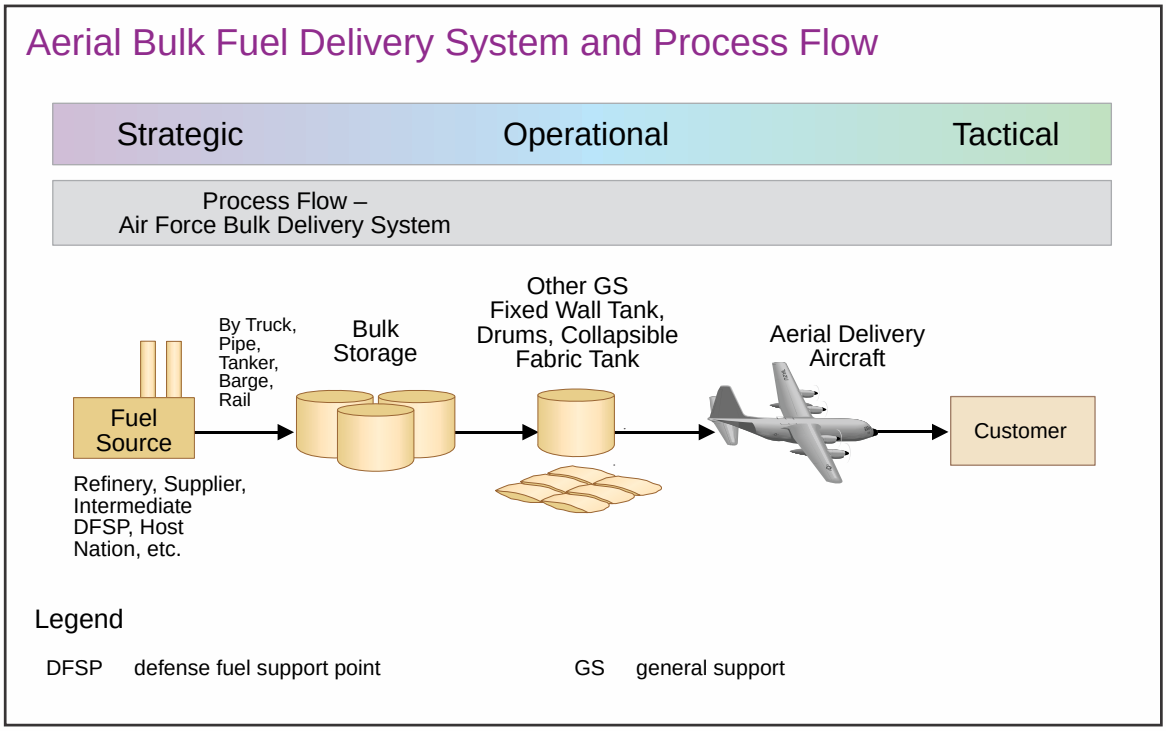

Figure IV-4. Aerial Bulk Fuel Delivery System and Process Flow

(6) **Expanding Distribution.** As theater requirements expand, IPDS may be installed depending on the volume of requirements, the expected duration of the employment, and the type of operation (e.g., foreign humanitarian assistance or peacekeeping). Other delivery means, operated either by military or commercial sources, such as tank trucks, barges, and aircraft, may be incorporated into the overall distribution system depending on road, river, or airport infrastructure.

(7) **Airfield Operations.** Fuels support equipment required for initial support of airfield operations will be determined based upon fuel support requirements, real estate availability, HNS, method of resupply, and other conditions. Initial support of airfield operations using refueling trucks may be sufficient at some locations. However, during Operation ENDURING FREEDOM and Operation IRAQI FREEDOM, the USAF quickly realized the Vietnam-era air-transportable hydrant refueling system was not capable of efficiently supporting rapidly expanding aviation fuel requirements at most airfields. In order to address this situation, it deployed FORCE, which includes the use of larger diameter hoses, higher capacity pumps and filters, additive injection capability, and programmable logic control units to automatically adjust fuel flow rates and pressure requirements. The supply chain is depicted in Figure IV-5.

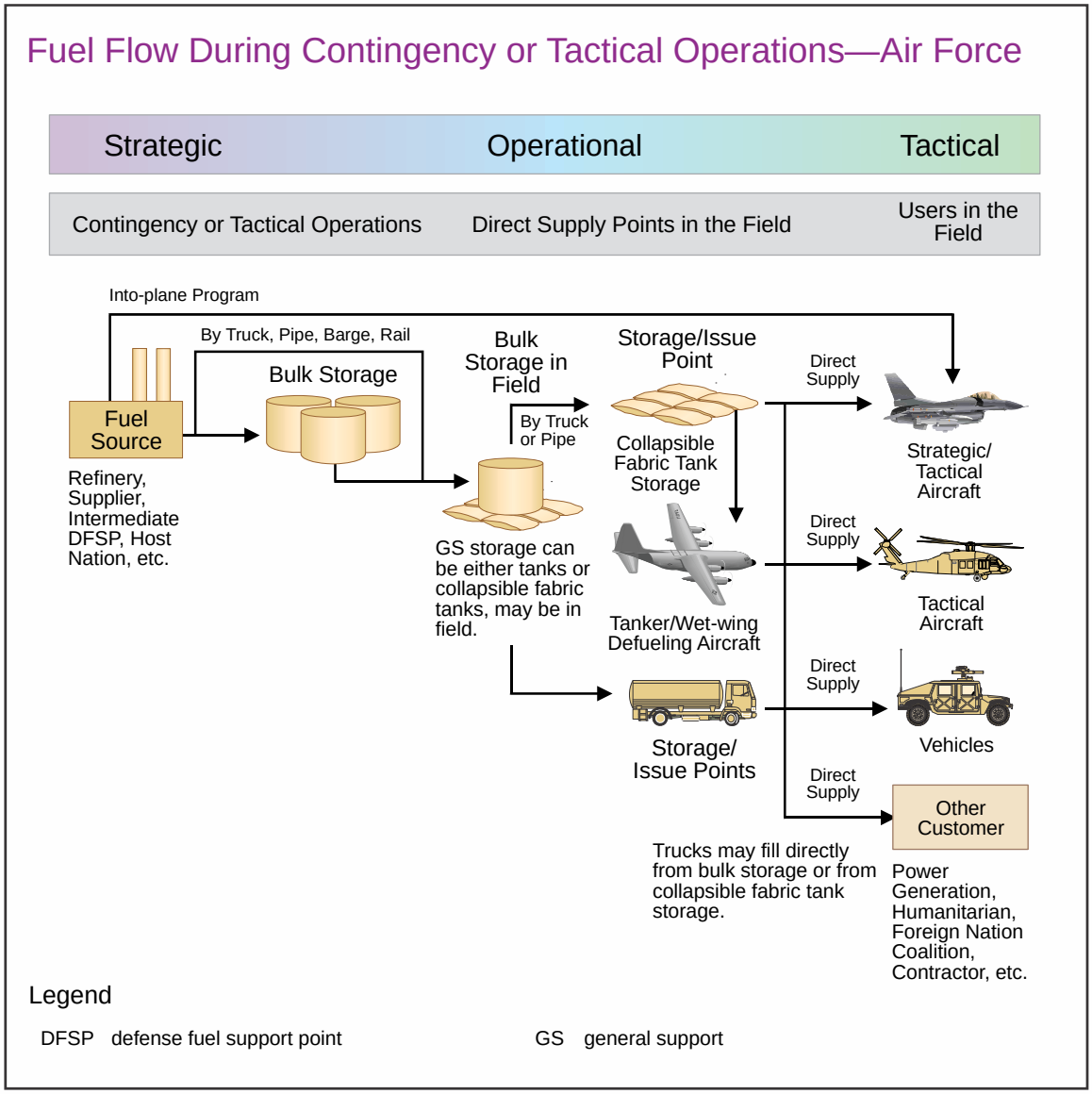

Figure IV-5. Fuel Flow During Contingency or Tactical Operations—Air Force

3. Military Construction; Sustainment, Restoration, and Modernization; and Environmental Compliance

a. DLA, through DLA Energy, establishes and maintains a DOD bulk petroleum distribution system and related programs in coordination with the Services and the CCMDs. DLA, Services, and CCMDs have interrelated responsibilities to plan and execute for MILCON, minor construction, operation of facilities, SRM, and environmental compliance of bulk storage and distribution facilities in support of the bulk petroleum management mission. The corresponding JPO should coordinate on SRM actions, DLA and Service-initiated MILCON affecting their AOR to ensure synchronization with contingency planning and execution.

b. The CCMDs assist DLA with the selection and prioritization of its fuel MILCON and qualified SRM projects for petroleum facilities in their areas.

c. The Services, after coordinating with the supported CCMD JPO, assist DLA in the selection and assignment of a priority to the petroleum MILCON projects identified for the DLA MILCON program. They also provide technical support to identify and execute projects for DLA-funded SRM and other qualified construction at the Services' petroleum facilities. The JPO is notified of all repairs that will affect fuel storage and throughput for more than 48 hours.

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CHAPTER V
JOINT BULK PETROLEUM LOGISTICS

"Unleash us from the tether of fuel."

General James T. Mattis, United States Marine Corps
During his 2003 tour as Commanding General
1st Marine Division in Operation IRAQI FREEDOM

1. Introduction

a. The JPO has the primary responsibility of synchronizing the fuel requirements throughout the joint force. By designating a SAPO in the subordinate commanders' joint staff, the JPO enhances the ability to control outcomes that support the planning and execution of the operation.

b. Joint bulk petroleum logistics emphasizes unity of effort by integrating knowledge and experience with Service, multinational agencies, and other organizations' capabilities. This permits the logistician to exercise options, provide oversight, fuse information, and leverage technology. A scenario depicting some of the organizations, roles, and actions in planning for successful bulk petroleum support is presented in Appendix C, "Petroleum Scenario." The following sections describe in more detail the participants and roles in managing bulk petroleum logistics.

2. Authorities, Responsibilities, and Roles

a. Integrated materiel management (IMM) is the exercise of total DOD-level management responsibility for a federal supply group or class, commodity, or item for a single agency, which normally includes computation of requirements, funding, budgeting, storing, issuing, cataloging, standardizing, and procuring functions. IMM underlies the principles in joint bulk petroleum doctrine. Because IMM both supports and influences joint bulk petroleum logistics, understanding it is important.

b. The Under Secretary of Defense for Acquisition, Technology, and Logistics (USD[AT&L]) is responsible for establishing policies for management of bulk petroleum stocks and facilities, and for providing guidance to other DOD agencies, Joint Staff, and Services. Additionally, USD(AT&L) is responsible for resourcing and maintaining area petroleum laboratories, where it has authority to test samples of petroleum products submitted for QA and QS, in coordination with the Military Departments and agencies. The Deputy Under Secretary of Defense for Logistics and Materiel Readiness serves as the central administrator for energy management and has IMM oversight responsibility for fuel products. The Under Secretary of Defense (Comptroller), in coordination with USD(AT&L), is responsible for establishing financial policies and guidance for management of bulk petroleum products.

c. DOD published the *Energy for the Warfighter: Operational Energy Strategy* in 2011, to transform the way the Armed Forces consume energy in military operations.

The strategy sets the direction for operational energy use within OSD, the Chairman of the Joint Chiefs of Staff (CJCS) and the Joint Staff, CCMDs, Military Departments, and DOD agencies. DODD 4180.01, *DOD Energy Policy*, establishes policy and guidance and assigns responsibilities for energy planning, use, and management for DOD. The Assistant Secretary of Defense for Operational Energy Plans and Programs (ASD[OEPP]) and a designee from the CJCS co-chair a Defense Operational Energy Board to promote operational energy security, oversee the implementation of the strategy, and measure departmental success. ASD(OEPP) also provides direct liaison with CCDRs to facilitate initiatives that reduce energy consumption.

d. The Chairman of the Joint Chiefs of Staff coordinates with DLA Energy, Services, and CCMDs to resolve petroleum issues. The JS J-4 is the primary agent of the Chairman of the Joint Chiefs of Staff for all bulk petroleum matters. Key responsibilities of the JS J-4 that influence joint petroleum principles and affect operations are to:

(1) Act as the focal point for joint bulk petroleum doctrine.

(2) Make recommendations to DOD on wartime fuel sourcing and pre-positioning DOS.

(3) Prescribe CCMD procedures for reporting bulk petroleum.

(4) Provide fuel input to the Joint Strategic Capabilities Plan and review fuels planning in prescribed joint OPLANs.

3. Joint Petroleum Office and Subarea Petroleum Office

a. The GCC has the predominant fuels responsibility within a theater, and this responsibility is discharged by the JPO (see Figure V-1). The JPO works in conjunction with its Service components, SAPOs, and DLA Energy to plan, coordinate, and oversee all phases of bulk petroleum support for US forces and other organizations, as directed, and employed or planned for possible employment in the theater. JPOs typically have a mix of Service representatives. Operational requirements may dictate the establishment of SAPOs in support of subordinate JFCs; however, consideration should be given to the operational area and expected mission support, force composition, and sustainment requirements when selecting SAPOs.

b. A SAPO is a sub-office of a JPO and is established by the CCDR or JFC (usually upon JPO recommendation) to fulfill bulk petroleum planning and execution matters in a section of the theater for which the JPO is responsible. A theater may have more than one SAPO. SAPOs are normally required to:

(1) Conform to the administrative and technical procedures established by the CCDR and DOD 4140.25-M, *DOD Management of Bulk Petroleum Products, Natural Gas, and Coal Acquisition and Technology*.

(2) Be under the operational control of the JFC.

Key Petroleum Responsibilities of the Combatant Commanders with Joint Petroleum Offices

- Plan and coordinate the receipt, storage, and distribution of petroleum products in theater in coordination with the Defense Logistics Agency (DLA) and Service component commanders.
- Coordinate, validate, and prioritize petroleum military construction.
- Provide petroleum logistic planning and policy guidance to component commanders.
- Negotiate, in coordination with DLA, formal host nation support and coordinate the development and release of alliance or coalition petroleum planning information.
- May assume temporary operational control of DLA Energy elements overseas in a major emergency in accordance with a coordinated memorandum of understanding.
- Coordinate with adjacent joint petroleum offices for use of available stocks in theaters to support regional contingencies.
- Direct tactical movement of fuels by means available to any Service component in a theater.
- Plan and coordinate the use of captured or abandoned enemy bulk fuel assets.
- Coordinate with DLA Energy for multinational petroleum support.
- Ensure fuel requirements, operations, restraints, and constraints are addressed in the fuels annex of operation plans.
- Establish lead Service or agency responsibilities for Common Class III support as appropriate for each separate joint operation.
- Release or reallocate theater war reserves in an emergency.
- Validate Service component bulk fuel requirements (and additives if required) in wartime or during contingency operations.
- Decide, in coordination with DLA, between military and contract fuel support.
- Integrate threat assessments and force protection measures into petroleum planning and operations.
- Ensure components and DLA Energy have a robust quality assurance program.
- Establish predominant fuel.

Figure V-1. Key Petroleum Responsibilities of the Combatant Commanders with Joint Petroleum Offices

c. The key duties and responsibilities of the SAPO include the following:

(1) Advise the JFC and staff on petroleum logistic planning and policy, and provide Service components and commands with the JFC's petroleum logistic plans and policy.

(2) Prepare directives concerning the management, accountability, operation, and QA of petroleum activities in the operational area.

(3) Prepare petroleum input for JFC supporting plans and develop daily demand profiles and petroleum supply and distribution plans for OPLANs and OPORDs.

(4) Establish a direct LOC with the CCMD JPO concerning all aspects of petroleum activities.

(5) State bulk petroleum requirements through the CCMD JPO to DLA Energy to obtain sourcing from DOD stocks, local commercial, or host government resources using DLA Energy contractual coverage or service/country fuel agreements.

(6) Submit REPOL, as required, to the CCMD JPO.

(7) Assign JFC priorities and advise the CCMD JPO and DLA Energy for MILCON and SRM projects for petroleum facilities.

(8) Validate existing quantity and quality of local inventories, estimated DOS on hand, and method and quantity of daily resupply capability, by product.

(9) Coordinate and advise the CCMD JPO concerning local petroleum capabilities.

(10) Establish JFC requirements and coordinate with the JPO and DLA Energy for leased storage and related activities in the operational area.

(11) Coordinate with the HN and local commercial entities to determine availability of commodity and capability to support bulk petroleum operational requirements; identify or submit requirements IAW current HNS agreements to the HN for petroleum support.

(12) Supervise bulk petroleum operations and coordinate with commercial sources and HN governments for the use of tanker loading and off-loading facilities.

(13) Coordinate with the DLA Energy, CCMD JPO, and Service component bulk petroleum managers to maintain visibility of bulk petroleum operations.

(14) Maintain operational petroleum delivery requirements from Service component petroleum managers to maintain visibility of bulk petroleum operations.

(15) Consolidate component delivery requirements and forward them to DLA Energy.

(16) Coordinate QA program activities.

(17) Advise the JFC, under emergency conditions, on the allocation of bulk petroleum and facilities, and coordinate with component control points.

(18) Recommend the release or reallocation of PWRS.

(19) Notify the JS J-4 and the CCMD JPO when PWRS will be penetrated and provide a plan for reconstitution of levels including a time frame when levels will be covered.

(20) Maintain thorough knowledge and understanding of JFC OPLANs and OPORDs, and component and supporting forces concepts of operations and support. Generate the IPDP for each OPLAN/OPORD.

(21) Coordinate allocation and construction of inland petroleum distribution system assets.

(22) Track and account for all ground fuel movements in the area of operations to include deliveries to non-capitalized locations. The SAPO cannot complete this task unless a requirement for the SAPO to be notified of all completed deliveries, and of any diversions while en route, is established. In the absence of an established SAPO the reporting requirements would remain at the JPO.

4. Service Component Theater Bulk Petroleum Organizations

a. Each Service provides for product handling at its operational locations. The Services coordinate all fuel issues with the appropriate JPO, SAPO, and DLA Energy during operations, including exercises and deployments, to ensure efficiency and avoid duplication of effort. Normally, the USA will provide distribution of bulk petroleum within theater.

b. With increasing contractor support, Services must constantly review their responsibilities for tactical petroleum functions. DLA Energy normally delivers fuel to the point of end use with additives already introduced into commercially available fuels. But in some cases, such as extremely austere environments, delivery forward may not be possible. It is unlikely that contractors would be able to provide military specification (MILSPEC) fuels to an operational area during the earliest stages of inland-based operations, contingencies, or short duration exercises; therefore, it is imperative that the Services participating in land-based operations have the capability to inject needed additives into commercial fuels until DLA Energy or Services can arrange delivery of MILSPEC fuels or contract support for additive injection, including equipment, training, and technical ability to inject additives. Further, joint and Service planners should know about these special requirements for additives.

c. Inspection, sampling, testing, and documentation are required by each Service and agency to assure quality of fuel products received, stored, issued, and used. The applicable Service military specification custodians are responsible for development and maintenance of petroleum-product specifications in support of aviation and ground fuels. To perform

the petroleum support mission, each Service is responsible for the items shown in Figure V-2.

For additional information on QA and QS, see DOD 4140.25-M, DOD Management of Bulk Petroleum Products, Natural Gas, and Coal Acquisition and Technology, *and MIL-STD-3004,* Quality Assurance/Surveillance for Fuels, Lubricants, and Related Products.

(1) **Army.** The USA normally provides management of overland petroleum support, including inland waterways, to US land-based forces of all DOD components. The USA provides the necessary force structure to install, operate, and protect tactical petroleum storage and distribution systems, including pipelines. In a theater, this responsibility also includes providing a system that transports bulk petroleum inland from the high-water mark of the designated ocean beach (IPDS/OPDS operations).

(2) **Air Force.** The USAF maintains the capability to provide tactical support to USAF units at improved and austere locations. It also provides distribution of bulk petroleum products by air where immediate support is needed at remote locations. The USAF satisfies this requirement with the ABFDS for aerial bulk delivery and the ABFDS with alternate capability equipment for delivery directly to

Petroleum Responsibilities of the Services

- Operate petroleum facilities under Service ownership.
- Implement fuel standardization policies.
- Assist Defense Logistics Agency (DLA) in selection and assignment priority of fuel military construction projects and provide base-level technical support for DLA funded maintenance, repair, and construction at its fuel facilities.
- Manage Service-unique theater-assigned bulk petroleum transportation asset.
- Compute wartime petroleum demands based upon combatant commander operation plans, wartime fuel consumption rates, war reserve requirements by location, and establish daily wartime demand profile.
- Organize, train, equip fuel support force.
- Services requiring fuel additives should have or be able to obtain the necessary training and equipment to put additives into bulk fuel in austere environment.
- Validate Service bulk fuel requirement.

Figure V-2. Petroleum Responsibilities of the Services

aviation assets. Additionally, the Air Force can accomplish forward-area petroleum support through wet-wing refueling operations. At larger airfields, the USAF provides the fuels support equipment to support expanding aircraft operations.

(3) **Navy.** The USN provides seaward and over-the-shore bulk petroleum products to the high-water mark for US sea-based and land-based forces of all DOD components. The USN maintains the capability to provide bulk petroleum support to naval forces afloat and ashore (to include US Coast Guard forces assigned to DOD).

(4) **Marine Corps.** The USMC maintains a capability to provide bulk petroleum support to its units. In addition, the Marine Corps may be tasked to provide petroleum support to any joint force and/or MNF, as directed by the JFC.

(5) **Coast Guard.** The Coast Guard coordinates petroleum requirements with the Navy. When so designated, or as delegated from the Navy to Coast Guard, the Coast Guard performs the roles and functions of a joint fuel logistics supply point.

5. Managing the Joint Bulk Petroleum Supply Chain

a. The Director, DLA, is responsible for meeting designated petroleum support requirements of the DOD components. These functional responsibilities have been delegated to the Director, DLA Energy, and include procurement, ownership, QA and QS, accountability, budgeting, and distribution of bulk petroleum stocks to the point-of-sale.

b. DLA Energy manages the bulk petroleum supply chain from source of supply to the point of customer acceptance as the DOD EA and IMM for bulk petroleum.

c. These responsibilities mandate that DLA Energy exercise total DOD-level management responsibility for bulk petroleum, including the requirements, funding, budgeting, storing, issuing, cataloging, standardizing, and procuring functions. The roles between the JPO, SAPO, Service components, and DLA Energy have become more integrated due to the ownership of DOD bulk petroleum and the expanded role of DLA Energy's support to the warfighter. Key functions of DLA Energy that influence joint bulk petroleum principles and affect operations include the following:

(1) Procure fuel to meet US military requirements in both peacetime and war, making every effort to purchase commercial and military specification fuels.

(2) Plan, program, budget, and fund facility maintenance, repair, and construction of new fuel facilities.

(3) Administer and fund maintenance, repair, construction, and eligible environmental-remediation projects, in coordination with the Services and CCMDs.

(4) Plan, program, budget, and fund contract storage and associated services, to include refueling vehicles and equipment or aircraft servicing contracts, if appropriate, for bulk petroleum support.

(5) Negotiate and conclude international agreements in conjunction with the CCMDs to provide bulk petroleum support overseas.

(6) Develop contingency support plans in concert with supported commanders to acquire the necessary petroleum products, storage, and services.

(7) Provide technical support to the applicable military custodian responsible for development and management of petroleum product specifications.

(8) Allocate resources in support of PWRR, compute OS requirements, and develop an IMP that identifies inventory levels, storage, and covered requirements.

(9) Develop the annual quantity of bulk PWRS in coordination with the Services and CCDRs.

(10) Continuously evaluate the petroleum market and advise OSD, Joint Staff, and Services of resupply issues critical to peacetime and wartime operations and planning, such as adjusting DOS or recommending augmented safety levels for products and locations where the commercial market base cannot react to surges in demand.

(11) Acquire the necessary petroleum product, storage, and/or services within an AOR, to include non-tactical refueling vehicles, equipment, and refueling contracts, to support military requirements.

(12) Ensure delivery of Class III bulk petroleum as closely as possible to the point of intended use or to where it can reasonably be expected to be delivered by the contractor; address force protection issues to the supported CCDR.

(13) Assume management of wholesale bulk petroleum facilities that the CCMD JPO or SAPO has acquired for support of US forces in a mature theater.

(14) Establish regional offices to facilitate practical and responsible decisions that ensure expeditious delivery of fuel products to each Service. DLA Energy established regional offices to maintain close contact with customers to ensure their particular needs are considered when planning fuel support. In general, DLA Energy regional offices coordinate delivery orders with industry, resolve logistic problems, supply emergency products, perform QA and management activities, coordinate maintenance and repair projects, and assist the JPO in petroleum logistics planning. During an emergency, DLA Energy may also place additional liaison officers at the appropriate command levels.

6. Commander, United States Transportation Command

a. The Commander, USTRANSCOM, plans for and provides air, land, and sea transportation of fuels for DOD during peacetime and wartime. These efforts will supplement and not replace the primary responsibilities assigned to the Services and DLA, especially with regard to intratheater and inland fuel movement and distribution. Other bulk petroleum responsibilities include developing long-range plans, in coordination with CCMD JPOs, for petroleum support of the intertheater mission and contingency operations worldwide; monitoring all en route MILCON projects; and overseeing and validating fuel, data reporting and requirements by Air Mobility Command (AMC) and Military Sealift Command (MSC) to the CCDRs. The JPO, USTRANSCOM, represents Commander, USTRANSCOM, on all petroleum and water-related issues involving USTRANSCOM and components.

b. The key duties and responsibilities of the USTRANSCOM JPO include the following:

(1) Prepare plans, policies, and procedures for executing petroleum operations as they relate to supporting the USTRANSCOM strategic mission.

(2) Develop long-range sustainment plans for petroleum support of USTRANSCOM's intertheater mission and contingency operations worldwide.

(3) Review long-range plans for positioning of petroleum assets.

(4) Serve as a voting member on DLA's Installation Planning and Review Board, providing command recommendations on budgetary expenditure for out-year MILCON projects.

(5) Oversee and validate all fuel data reporting by AMC and MSC.

(6) Assist warfighting commanders on establishing their fuel-related priorities.

(7) Participate in all standing en route infrastructure steering committees, analyzing fuel-related issues.

(8) Coordinate with other JPOs to deconflict requirements.

7. Multinational Partners

a. Negotiations can occur with the HN under the auspices of an acquisition and cross-servicing agreement (ACSA) or a stand-alone international agreement. An ACSA is usually negotiated by the CCMD and is authorized under the acquisition and cross-servicing authorities, Title 10, USC, Sections 2341–2350. DLA Energy, as delegated by DOD through DLA, has overall responsibility for negotiating, concluding, and amending international agreements for petroleum support. A stand-alone international agreement is usually negotiated by DLA Energy or a Service through the appropriate US embassy as

authorized in DODD 5530.3, *International Agreements.* That directive provides the basis for the following guidance, except where superseded by law.

b. Fuel exchange agreements are negotiated with foreign governments to provide fuel support and to improve relations between the US and foreign militaries. In these agreements, products are supplied on a reciprocal basis, either with an exchange of fuel or cash payment, between the military organizations of both countries. These agreements are operational tools that enhance sustainability and readiness, because countries routinely train and support each other.

c. Replacement in kind (RIK) transactions, dealing directly with the governments of these eligible countries, provide materiel and services for a logistic exchange of materiel and services of equal value. These items are accountable as future reimbursements to the country that initially provides them without charge. Costs for these items have a current value that is captured as future reimbursements. The JFC's comptroller develops and implements procedures, in coordination with logistic elements, to track the value of support provided to ensure an equal exchange of valued materiel and services throughout the operation. Particular care must be taken in accounting for these authorized exchanges due to the political sensitivity inherent in multinational operations. Ideally, RIK transactions should derive no monetary gain and should provide mutual benefit and equity between the participating countries.

8. Contracts and Agreements

a. **Blanket Purchase Agreement (BPA).** A BPA should be considered for filling anticipated repetitive needs for supplies or services for a stated time period. Individual BPA purchases should not exceed the simplified acquisition threshold, with the exception of commercial item purchases, which may be substantially larger. For current ceilings, see Federal Acquisition Regulation Part 13.

b. **Into-Plane/Into-Truck Contracts.** Circumstances frequently require refueling military aircraft at commercial airports where military facilities or personnel are not available. To minimize commercial costs and ensure that quality products will be available, an into-plane contract may be established. Once the supported CCDR defines the requirements, the contracts are negotiated by DLA Energy. An into-plane contract guarantees a quality product but does not guarantee a specific quantity of product. Any Service, CCDR, or federal agency may request that DLA Energy establish an into-plane contract. Noncontract fuel purchases may be made at civilian airports using the aviation into-plane reimbursement card (commonly known as the AIR Card) where DLA Energy has not established an into-plane contract. Into-truck contracts are similar to into-plane contracts but can be used to fill Service or contractor vehicles for distribution to customers not at the airfield. Services can establish off-site storage facilities to meet requirements around the clock that are not tied to the operating hours of the airport. This type of contract takes advantage of the established commercial resupply capability to the airport while meeting non-aircraft requirements.

INITIAL SUPPORT OF DEPLOYING FORCES

In January 2005, DESC [Defense Energy Support Center] had into-plane fueling contracts at 188 airports outside of the US. These contracts provided for fuel servicing in 103 foreign countries, and provided the foundation for fuel support for rapidly deploying forces. The annual contract quantities exceeded 284 million gallons of aviation fuel. These contracts provided the mechanism for rapid expansion of fuel support for contingency operations worldwide. Most of these airports do not provide JP8. Only 22.3% of the contract quantity was for JP8, while the vast majority of fuel (67.2%—over 190 million gallons) under contract was Jet A-1 without FSII [fuel system icing inhibitor] or CI/LI [corrosion inhibitor/lubricity improver]. Russian commercial fuel designated TS-1 made up 10.5% of the DESC into-plane contract quantities. Most commercial airports outside the United States do not offer Jet A-1 with FSII or CI/LI because the commercial airlines do not want these additives in the fuel they use. Both of these additives are surface active agents (surfactants) that can interfere with the ability of the filtration systems to remove water from jet fuel.

In addition to consuming over 190 million gallons of commercial Jet A-1 without FSII or CI/LI from into-plane contracts, USCENTAF [United States Air Force Central Command] activities issued over 106 million gallons of Jet A-1 without FSII or CI/LI to coalition aircraft during CY [calendar year] 2003. Most of this unadditized fuel was issued to airlift aircraft while locations primarily servicing fighter aircraft injected the additives into fuel during receipt into the bulk storage systems. Additives were injected to the maximum capability that additive, equipment, and personnel resources allowed. Nevertheless, almost 107 million gallons of Jet A-1 without FSII or CI/LI were issued, with the bulk of the unadditized fuel going to airlift aircraft.

SOURCE: AFPET [Air Force Petroleum Office] Fuels Capability Study, Additive Deletion Cost/Benefit Analysis, September 2005

c. **Bunker Contracts.** DLA Energy bunker contracts have been established to provide propulsion fuel where US Government-owned stocks are not available. A variety of commercial fuel types (MGO [marine gas oil], intermediate fuel oil [IFO]-180, and IFO-380) and delivery methods (e.g., barge, pipeline, tank truck) are provided under the bunker contract program. Ships' bunkers Easy Acquisition (SEA) Card ® is the web based system used to order fuel under the bunker program. It is the ordering officer's responsibility to ensure that the order details are input into the SEA Card ® system. The requirements for the bunker contracts are processed through each SCP, and forwarded to DLA Energy for contract administration.

d. Direct delivery and post, camp, and station (PC&S) contracts and transportation tenders. DLA Energy, as the EA for worldwide petroleum support, can establish a variety of free on board origin and destination direct delivery PC&S contracts, and transportation tenders to support the CCDR.

e. HNs, through agreements, can provide a variety of environmental services, while the JFC is expected to comply to the maximum extent with local laws and regulations.

f. The use of wartime host-nation support (WHNS) bulk petroleum infrastructure and transportation assets in a mature theater is a critical part of the IPDP. The JPO or SAPO must ensure Service components are aware of potential WHNS infrastructures and that requests are forwarded and updated for joint OPLAN and requirements for contingencies are submitted in a timely manner. Each operational area and contingency will have unique procedures and policies for submission and approval of WHNS requests. It is the JPO or SAPO responsibility to interface with CCDR WHNS agencies and ensure that all Service component requests are submitted and acted upon in a timely manner. During the adaptive or contingency planning process, a key element of friendly information the JPO or SAPO and Service component fuel planners must acquire is WHNS bulk petroleum infrastructure and distribution capabilities that potentially could be dedicated to support US forces. By leveraging the dedicated and trusted WHNS bulk petroleum infrastructure and distribution capabilities, the JPO or SAPO can dedicate the finite organic tactical bulk petroleum assets for those areas of the operational area that require tactical-level support. Fuel requirements for HNS can be provided to DLA Energy International Agreements Office for negotiation of an agreement with a foreign government to cover terms, conditions, and prices.

g. Fuel or storage support is also provided by commercial sources within foreign countries to US military forces. These types of contractual arrangements are routinely negotiated by DLA Energy to provide fuel support at international air or sea ports to meet military requirements.

CHAPTER VI
PRINCIPLES OF BULK WATER PURIFICATION, STORAGE, AND DISTRIBUTION

"When the well is dry, we know the worth of water."

Benjamin Franklin, *Poor Richard's Almanac*, 1746

1. Introduction

a. **Water is one of the largest and most important life-sustaining commodities.** As water requirements rise above individual or small unit needs, they need to be handled in "bulk" form. Bulk handling calls for specialized equipment, product-handling safeguards, and standard operating procedures.

b. To provide the most efficient and effective use of water stocks and equipment, water planners must be familiar with Service, DOD agency, and CCDR water assets, policies and responsibilities. DODD 4705.01E, *Management of Land-Based Water Resources in Support of Contingency Operations*, designates the Secretary of the Army as the DOD Executive Agent for land-based water resources. This responsibility applies to all aspects of land-based water support for the Services during contingency operations, including water selection, pumping, purification, storage, distribution, cooling, consumption, water reuse, water source intelligence, research and development, acquisition of water support equipment, water support operations doctrine, human factors requirements, training, and water support force structure. To ensure adequate support, commanders and their staffs should address planning for tactical water support in all plans and orders.

c. Water is supplied as either a packaged or bulk product. A packaged product is manufactured and procured, stored, transported, and supplied in a container. Water in larger quantities is a bulk commodity. Planners must consider alternative supply methods for bulk water. Packaged methods require extensive shipping, require materials handling equipment to move, and provide less product/volume when compared with bulk operations. Planners should weigh the advantages and disadvantages of packaged and bulk water carefully to ensure the best method is chosen to support the contingency.

2. Tactical Bulk Water Operations

a. **Tactical bulk water-support operations are implemented to purify water as close to the user as possible.** This methodology involves detailed planning for the water point selection site and the purification, storage, and distribution of bulk water.

b. **Bulk Water Support Responsibility. Bulk water support normally is a Service responsibility.** However, during joint operations, if delegated authority by the GCC, the subordinate JFC may assign water-support responsibilities on an area basis, using the lead Service methodology, i.e., the dominant user or the most capable Service in an area may be tasked to provide water support to all forces operating in that area. The

actual procedures used to provide bulk water support to the Services will depend on conditions in the operational area.

c. **Distribution. In most situations, water distribution is the "weak link" of the water support system.** Moving water from the production and storage sites to the user can be equipment and manpower intensive. Joint forces must make efficient use of all available assets in conducting water-distribution operations. Transporting water from the storage site to the using units can involve utilizing various means from bottled water, water cans, the 2,000-gallon hippo [load handling system compatible water tank rack] to the USMC 50,000-gallon water tank asset.

3. Planning Guidance

a. **Water planners at all levels must include water supply procedures and guidance in exercises and OPLANs.** Planners need to ensure that forces have adequate resources for water purification, storage, and distribution. Water support planning is a continual process beginning with the identification of the force size and planned deployment rate. Time-phased water requirements are then determined and units are selected and scheduled for deployment based on the requirements. Total water requirements are placed in the theater water distribution plan developed by the CCDR, with support from the Service component commander (see Figure VI-1).

For more information, see Army Technical Bulletin Medical (TB MED) 577/Navy Medicine (NAVMED) P-5010-10/Air Force Manual (AFMAN) 48-138_IP, Sanitary Control and Surveillance of Field Water Supplies.

b. Lessons observed and learned by JFCs deployed in support of Operation IRAQI FREEDOM and Operation ENDURING FREEDOM have identified growing environmental health threats to the joint force. JFCs and their appropriate staff members should maintain visibility on waste management by-products (to include wastewater)

Critical Water Support Planning Elements

- Development of detailed water distribution plans
- Identification of water support requirements for other Services, multinational forces, and host nation labor forces
- Water support structure (personnel and equipment) that is capable of providing the required water production, purification, storage, and distribution
- Water quality procedures
- Identification of quality local water
- Identification of possible impact on production due to water quality

Figure VI-1. Critical Water Support Planning Elements

resulting from employment of the water support plan sustaining joint force operations. Joint forces are obligated to dispose of wastewater in an environmentally responsible manner per HN agreements and federal regulations.

4. Consumption Requirements

a. Water consumption requirements are based on the size of the force. Figure VI-2 lists the requirements and considerations.

b. **Region.** Water consumption depends on the region such as tropical, arctic, temperate, or arid. Water sources are normally abundant in temperate, arctic, and tropical regions. Although non-potable water is easily available, treatments may be required for certain or all uses. For this reason, non-potable water should be included in consumption estimates if treatment is necessary. In arid regions, water sources are sparse and water must be transported forward. In arid regions, in early phases of establishing base camps or forward operating bases, requirements for both potable and non-potable water will be met with potable water in order to prevent having to operate and maintain two storage and distribution systems. As a result, total potable requirements will increase in the arid regions. As operations mature, the focus should change to water conservation and reuse by planning and establishing storage and distribution systems for both potable and non-potable water systems. In all regions, plan for 10 percent of the water to be lost through four percent evaporation and six percent waste and spillage. Spillage is what is spilled on the ground; waste is what the reverse osmosis water purification unit cannot purify and that is released as waste or brine water. Whenever actual logistics intelligence of the theater historical data, experience, or command planning guidance provide different or more accurate data, logistics planners should modify appropriate consumption data as necessary.

Water Consumption Requirements

- Drinking*
- Heat Treatment
- Infrastructure
- Personal Hygiene*
- Food Preparation*
- Laundering
- Centralized Hygiene*
- Force Provider
- Additional Requirements
  - Hospitals*
  - Chemical, biological, radiological and nuclear decontamination to include toxic industrial materials
  - Vehicle maintenance
  - Mortuary affairs
  - Engineer construction
  - Aircraft washing
  - Tactical ice plant*
  - Refugee, detainee, civilian internee, and prisoner of war camps*
  - Firefighting

* Requirements must be satisfied with potable water.

Figure VI-2. Water Consumption Requirements

c. **Requirements Determination.** It is extremely important to include the total water requirements into the mission planning. Plan and compute all requirements to include all water supply, purification, and storage requirements.

(1) **Supply Requirement.** To compute the total daily water requirement of the force, the actual personnel strength is multiplied by the proper consumption factor found in the Services' water consumption planning guides. The total, expressed as gallons per day, includes 10 percent for evaporation, waste, and spillage.

(2) **Purification Requirement.** To determine the amount of purification equipment needed to support the daily requirement, the total daily requirement is divided by the daily production capability of one purification unit. Under normal conditions, water purification equipment is operated 20 hours per day. However, many other factors affect water production.

(3) **Storage Requirement.** Temperate, tropical, and arctic regions usually do not require large amounts of water to be stored. Raw water sources may be adequate to meet non-potable requirements, and the potable requirements can be met by the water purification unit's organic storage tanks. In arid regions, large quantities of potable water must be stored. The storage requirement is based on resupply times, daily requirements, and the DOS requirements established by the commander. In arctic regions, the storage of water may be complicated by freezing temperatures.

d. **Essential Consumption.** When enough potable water cannot be produced to meet all the requirements, all but essential consumption must be reduced. Essential water requirements include drinking, personal hygiene, field feeding, medical treatment, heat casualty treatment, personal and patient/equipment decontamination in chemical, biological, radiological, and nuclear (CBRN) environments and, in arid regions, vehicle and aircraft maintenance. Consumption rates under these conditions are classified as minimum, enough for a force to survive up to one week. Requirements exceeding one week are classified as sustaining. In this classification, nonessential consumption includes centralized hygiene, laundry, and construction. To optimize water treatment equipment, unit commanders may decide to use non-potable water for showering, laundry, and personal or patient decontamination after performing a risk assessment in cooperation with preventive medicine personnel. Preventive medicine personnel should screen for the presence of health hazards such as skin-absorbed chemicals and pathogenic microorganisms. Non-potable water may require disinfection and rudimentary treatment to be safe for these activities. Preventive medicine personnel should document troops' exposure to untreated water containing hazardous substances and organisms.

e. **Water Vulnerability Assessment.** Vulnerability of the water system to CBRN attack, conventional attack, and man-made/natural hazards must be considered. Normally, a water vulnerability assessment of potential and existing water sources and distribution systems is conducted to evaluate the level of risk. Ensuring adequate security may include specific and appropriate countermeasures against tampering, adulteration, substitution, contamination, and other actions that could make the water unusable or potentially damaging to the end user. Water vulnerability assessments should be

conducted and documented in accordance with Army TB MED 577/NAVMED P-5010-10/AFMAN 48-13_IP, *Sanitary Control and Surveillance of Field Water Supplies.*

5. Water Support Operations

a. **Water Purification.** Once an adequate water source has been identified and located, water purification is the first step of tactical water support operations. During the purification step, water is drawn from a source and purified to potable standards. Potable water is certified safe for human consumption. Water typically is purified with a reverse osmosis water purification unit. Standards are verified by medical service personnel responsible for water surveillance. The amphibious bulk liquid transfer system is used to support USMC amphibious operations and maritime pre-positioning force (MPF) operations. It consists of 10,000 feet of buoyant 4-inch hose deployed on a maritime pre-positioning ship in MPF operations, which delivers potable water to the high water mark (and possibly the beach exit, to ensure continuous support past the line of demarcation) and water storage locations. **Production capacity can range from 75 gallons per hour to as high as 3,000 gallons per hour per purification unit or system.** See Figure VI-3 for water production capabilities of selected purification systems.

b. **Water Storage.** Water storage is the second step of water support operations. Storage is normally done at or very close to the purification sites. The goal of water storage is to keep a sufficient quantity on hand to prevent a water shortage if several purification units become nonoperational at one time. All storage of water will be in certified and approved containers. Commanders will consult preventive medicine

Water Purification Capabilities

Equipment	Salt	Fresh
Lightweight Water Purifier	75 GPH	125 GPH
Lightweight Water Purification System	75 GPH	125 GPH
1500 GPH TWPS	1200 GPH	1500 GPH
3000 GPH ROWPU	2000 GPH	3000 GPH

The GPH next to each piece of equipment is the maximum production for that equipment, in an ideal situation.

LEGEND

GPH gallons per hour
ROWPU reverse osmosis water purification unit
TWPS tactical water purification system

Figure VI-3. Water Purification Capabilities

personnel as necessary to ensure containers meet sanitary standards. Normally, it will be done using 3,000, 20,000, and 50,000-gallon collapsible fabric tanks. Water distribution begins from the storage site.

c. **Water Distribution. Water distribution often is the critical link in water support operations.** It is important for units to organize with sufficient organic water distribution equipment in order to provide supply point distribution. Units must have enough water distribution capacity to supply minimum requirements for water while making only one trip to the water point per day. During the early phases of deployments and in emergency situations, packaged water will be the primary means of resupply in forward areas. Once established, forces will use organic water distribution assets such as the SIXCON [six container] water storage module, the tactical water distribution system, semi-trailer mounted, fabric tank 3,000 and 5,000 gallon sizes, forward area water point supply system, M149A2 water trailer, camel (800 gallon water trailer), and hippo (2,000 gallon tank rack).

d. **Other Considerations.** Planners should maximize the use of HN sources if possible. **Water planners should assume no HN potable water is available in arid regions.** Minimal water sources and poor water quality may limit any operations that depend on HNS to meet the criteria set forth in the Army Technical Bulletin Medical 577/Naval Medical Command P-5010-10/Air Force Manual 48-138, *Sanitary Control and Surveillance of Field Water Supplies*, for water quality standards. The potential exists for chemical, biological, and radiological attacks as well as conventional attacks on joint water distribution systems. Therefore, it is prudent for the unit to use a residual disinfectant and conduct a vulnerability assessment as soon as practical after arrival in theater. **In the early stages of deployment, HN processed or bottled water may be used if it has been certified as potable by preventive medicine personnel.** However, in theaters, JFCs and planners must be aware of the following:

(1) **Food and Water Supply.** Though the United States is not a party to Protocol I to the Geneva Conventions, the US adheres to many of its principles. For instance, Article 54 of Protocol I to the Geneva Conventions states that it is prohibited to attack, destroy, remove, or render useless, objects indispensable to the survival of the civilian population, such as foodstuffs, agricultural areas for the production of foodstuffs, crops, livestock, drinking-water installations, and supplies and irrigation works, for the specific purpose of denying them for their sustenance value to the civilian population or to the adverse party, whatever the motive, whether in order to starve out civilians, to cause them to move away, or for any other motive. IAW US and DOD policy, no actions against these objects shall be taken that may be expected to leave the civilian population with such inadequate food or water as to cause its starvation or force its movement.

(2) **Labor Force Personnel.** The HN and theater contractor-provided water support must provide for the needs of its labor forces unless otherwise provided in HNS agreements. In the absence of an agreement, US forces may have to assume some responsibility for the care of labor forces.

(3) **Refugees.** Under international law, the host country, as the territorial sovereign, is responsible for refugees on its territory. In the event the host country's resources are strained by an influx of refugees, the host country may request assistance from other forces. Under the Geneva Convention Relative to the Protection of Civilian Persons in the Time of War, of 12 August 1949, an occupying power is responsible for ensuring public order and safety. Therefore, US forces, when acting as an occupying power, may have responsibility to provide refugee care.

(4) **Detainees.** The US is obliged to provide humane treatment to all persons in its custody (including prisoners of war and other types of detainee). This extends to providing sufficient water.

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APPENDIX A

JOINT OPERATION PLAN, APPENDIX 1 TO ANNEX D, PETROLEUM, OILS, AND LUBRICANTS SUPPLY

1. Purpose

To provide guidance and formatting for use in the preparation of the bulk petroleum supply appendix of OPLANs and CONPLANs. Refer to CJCSM 3130.03, *Adaptive Planning and Execution (APEX) Planning Formats and Guidance*, for the format for appendix 1 (Petroleum, Oils, and Lubricants [POL] Supply) to annex D (Logistics).

2. General

The POL supply appendix to the logistic annex should include sufficient information to identify the consumption planning factors, fuel levels, storage, distribution, and time phasing of bulk petroleum capabilities required to support the plan. In cases where finite bulk petroleum requirements have not yet been determined, time-phased estimates of bulk petroleum requirements and capabilities should be provided. Identify petroleum products and distribution capability on hand or readily available that can be used to satisfy requirements for the war reserve stockage and resupply period. Access to, and sourcing from, HN bulk petroleum stocks and distribution resources should be identified when viable.

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APPENDIX B

PLANNING GUIDANCE FOR APPENDIX 2 TO ANNEX D, JOINT SUBSISTENCE, FOOD SERVICE SUPPORT, AND WATER MANAGEMENT FOR OPERATION PLANS

1. Purpose

To provide guidance and formatting for use in the preparation of the water management portion of OPLANs and CONPLANs. Refer to CJCSM 3130.03, *Adaptive Planning and Execution (APEX) Planning Formats and Guidance*, for the format for appendix 2 (Joint Subsistence, Food Service Support and Water Management) to annex D (Logistics).

2. General

The water purification and distribution appendix to the logistic annex should include sufficient information to identify the consumption planning factors, storage, distribution, and time-phasing of water capabilities required to support the plan. In cases where finite water requirements have not yet been determined, time-phased estimates of water requirements and capabilities should be provided. Identify water purification and distribution capability on hand or readily available that can be used to satisfy requirements for the wartime tasking. Access to, and sourcing from, HN water and distribution resources should be identified when viable.

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APPENDIX C
PETROLEUM SCENARIO

This appendix provides a notional petroleum scenario featuring actions and tasks a JPO would perform at the start of a contingency. The purpose of this scenario is for potential or current JPO personnel to become familiar with the steps required to plan for and execute the early days of a contingency.

1. **Situation.** You are the joint petroleum officer for United States Africa Command (USAFRICOM). You have just been notified that an operation is being planned for the country of Wanda. Details of the operation follow.

2. **Mission.** The Secretary of Defense, by order of the President of the United States, directs the Commander, United States Africa Command (CDRUSAFRICOM), to plan for and conduct a FHA operation in the country of Wanda, Africa. US forces will assist the Wanda military forces and government agencies, intergovernmental organizations (IGOs), and nongovernmental organizations (NGOs) in accomplishment of this mission. It is anticipated that other nations will join this effort; however, the extent and timing of this assistance is uncertain. The US forces to be involved in this operation include US Air Force (one force projection wing and required transport aircraft), US Army (two brigades of the 82nd Airborne Division and appropriate support elements), US Navy amphibious ready group, and US Marine Corps (one Marine expeditionary unit). The Army is the lead Service for providing common item support to this operation to include petroleum support. The CDRUSAFRICOM has the predominant fuels responsibility within a theater, and this responsibility will be discharged by the JPO. The USAFRICOM JPO works in conjunction with its Service components, the SAPO (as appointed) for the Wanda area, and DLA Energy to plan, coordinate, and oversee all phases of bulk petroleum support for US forces employed or planned for possible employment in the theater. The JPO will have a mix of Service representatives. Operational requirements dictate the establishment of SAPOs in support of subordinate JFCs. However, consideration will be given to the joint operations area (JOA) and expected mission support, force composition, and sustainment requirements when selecting SAPOs.

3. **Background.** The Republic of Wanda is a small landlocked country in the Great Lakes region of east-central Africa, bordered by Ganda, Urundi, the Democratic Republic of the Ongo, and Zana. Home to approximately 10.1 million people, Wanda supports the densest population in continental Africa, most of whom engage in subsistence agriculture. A verdant country of fertile and hilly terrain, the small republic bears the title “Land of Many Valleys.”

4. **Geography**

a. The high altitude of Wanda provides the country with a pleasant tropical highland climate, with a mean daily temperature range of less than 2° Celsius (C). Temperatures vary considerably from region to region because of the variations in altitude. At Gali, on the central plateau, the average temperature is 21° C (70° F). Rainfall is heaviest in the

Overview map of Wanda surrounding area.

southwest and lightest in the east. A long rainy season lasts from February to May and a short one from November through December. In the west, near Zenbuye, annual rainfall averages 160 centimeters (cm) (63 inches [in]); in the northeast, 78 cm (31 in); and at Zentare, in the south, 115 cm (45 in).

b. Wanda has been characterized by significant civil and political unrest for the past 50 years. This unrest, coupled with living conditions, has resulted in the loss of an estimated one million lives during this time. The infrastructure in the nation has not kept pace with the population growth and demands and has contributed to significant shortages of water and food and medical care. Recent events have highlighted the severity of the situation and led the President to order an FHA operation.

5. **Petroleum Marketing.** Distribution and marketing of fuels products is carried out by ERP (Enterprise Wandaise de Petrole), SGP (Societe Generale de Petrole), Wanda Petrolgaz, PetroWanda (bought out by Atlantic Gas in June 1999), Western Oil (acquired by Genco in July 2000), and Atlantic Gas. ERP, SGP, and Wanda Petrolgaz are privately owned companies while the government had a major shareholding in PetroWanda.

6. **Petroleum Companies–Location**

Western Oil Wanda SARL

Western Oil Wanda

Genco Petroleum, Wanda

Enterprise Wandaise de Petrole

PetroWanda

Wanda Petrolgaz

Societe Generale de Petrole

a. ERP has the largest market share, followed by PetroWanda (now Atlantic Gas). There is no restriction regarding the importation of petroleum products.

b. In June 1999, Atlantic Gas took over Petro Wanda for US $2.1million. At the time of purchase, the company had more liabilities than assets. This constitutes part of the Wandan government's drive toward a massive privatization program. In July 2000, the South African company, Genco, acquired the marketing and distribution activities of Western Oil in Wanda and Urundi.

7. **Distribution and Storage**

a. As it is landlocked, the country depends on road, rail, or air transport, although pipelines are used for moving large volumes of petroleum. The main supply route runs from the Mombasa refinery to Nairobi in Kenya by a 485 kilometers (km) pipeline and on to Gali via Ganda by tank trucks along a 1,250 km road route. Alternative routes exist from Nairobi to Tanzania; Dar-es-Salaam to Gali; or by rail from Dar-es-Salaam to Tabora and Isaka and then by road from Isaka to Gali (600 km). Because of high transport costs, insecurity of supply, and low-income levels, the population relies heavily on traditional fuels, such as fuelwood, charcoal, and agricultural by-products, which account for 90 percent of the country's energy requirements.

b. The oil companies are required to keep 10,000 cubic meters of operational stock to ensure that there is sufficient petroleum supply within the country. Storage facilities are located at: Gali, Busenyi, Hengeri, and Zentare. There are three facilities of 3,660 cubic meters each at Hengeri and two facilities of 1,950 cubic meters at Zentare.

8. **Pricing**

The price of gasoline and diesel is fixed by the government while other petroleum products are not controlled. The government's oil price policy is used to keep the selling price constant while adapting the level of taxation to compensate for changes in the world

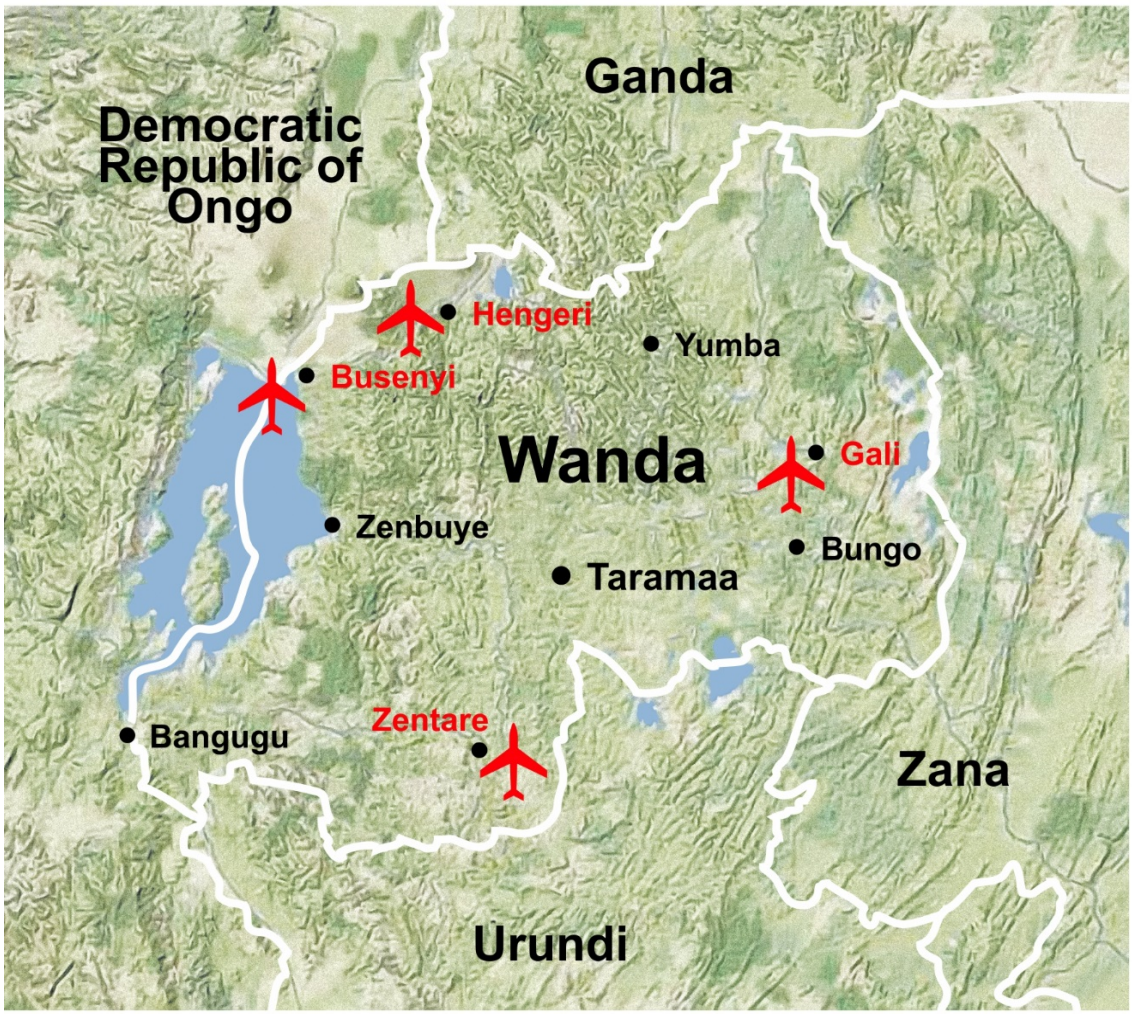
market. The tax content of the selling price of gasoline is 44 percent and of diesel 46 percent. Kerosene is taxed at 6.2 percent and fuel oil at 14.6 percent. The tax content includes a road fund tax.

9. **Wandan Airports**

10. **Solution**

a. The CDRUSAFRICOM has the predominant fuels responsibility within the theater, and this responsibility is discharged by the JPO. The JPO works in conjunction with its Service components, SAPOs, and DLA Energy to plan, coordinate, and oversee all phases of bulk petroleum support for US forces employed or planned for possible employment in the theater.

b. One of the early tasks of the JPO is to establish the lead Service or agency responsible for bulk petroleum support for this joint operation. Since the Army is going to have a major force on the ground and normally is tasked with the inland distribution of



Possible into-plane contract locations.

bulk petroleum, the JPO determines that the Army should be designated as the lead service for bulk petroleum.

c. Additionally, as a part of this effort, DLA Energy is asked to provide planning and information resources for use in this operation. Items that are most important are as follows:

(1) Availability of fuel from commercial sources

(2 Timeline for the provision of fuel

(3) Availability of commercial transportation

(4) Timeline for the availability of commercial transportation

(5) Amount of fuel that can be transported per day, by each transport mode

(pipeline, truck, etc.)

(6) Availability of commercial storage—where, how much, and when can it be available.

d. This should include the appropriate contracting resources, so contracts for local fuel, equipment, storage, and quality support can be established quickly.

e. The JPO requests that an in-country team of petroleum experts be deployed to Wanda very early in the deployment. This team includes DLA Energy, the components (especially the Army), and perhaps some civilian experts. The JPO discusses with DLA Energy whether that team should report directly to DLA Energy or be under the operational control of the JPO. Provisions are made for the administrative and life support for the team to include transportation.

f. The next major task the JPO undertakes is to provide petroleum logistic planning and policy guidance to the component commanders. This is not an easy task given the isolated location of Wanda and the apparent scarcity of petroleum resources. Major issues that are a top priority for information gathering are as follows:

(1) Each component is asked to do a projection of daily fuel requirements for the first 30 days of the operation.

(2) The JPO validates the component bulk petroleum requirements, as much as feasible.

(3) The bulk petroleum requirements are shared with DLA Energy planners and the lead for the Army. This is the basis for a considerable amount of the preplanning prior to the deployment.

(4) The JPO considers the support that might be required for the potential necessary support of other US Government departments and agencies, IGOs, and NGOs in accomplishment of this mission. Requirements are solicited from these organizations.

(5) The JPO must consider that at some time in the future support might potentially be necessary for forces from other nations who will join this effort even though the extent and timing of this assistance is uncertain. Since a tentative list of possible nations exists, the JPO starts to coordinate and negotiate multinational petroleum support.

(6) The JPO determines whether there are any existing DLA Energy contracts in the area.

(7) Additionally, the JPO researches what available contracts there are in adjacent countries or theaters to support this contingency.

(8) The JPO identifies available commercial resources, such as fuel transportation, storage, and quality testing, that might be put under DLA Energy contract.

(9) The JPO ascertains what theater war reserves are available for use. The release or reallocation of these resources are addressed in the OPLANs.

(10) Based on the answers and research on the preceding, the JPO requests that components estimate what tactical equipment must be sent into Wanda to support the operation.

(11) Based on the preceding fuel availability estimate, the JPO coordinates with DLA Energy to establish contracts in Wanda for fuel. DLA Energy also looks at adjacent countries for fuel and transportation assets that could be contracted to support the operation.

(12) The JPO also inquires what, if any, Wanda government or military resources are available that might be acquired through an HNS contract or other agreement.

(13) Coordination with the Air Force component and USTRANSCOM is accomplished to determine the stationing and refuel plan for transport and other aircraft. Since it appears that fuel resources in Wanda will be limited, aircraft flow is organized in such a way as to limit use of in-country fuel.

(14) Based on the above information, the JPO considers what fuel assets must be moved by air (e.g., aerial refuelers) to support the initial stages of the operation.

g. The JPO contacts the American embassy in-country team to explore possible HNS. If some HNS is available, the appropriate organization should negotiate, in coordination with DLA Energy, formal HNS agreements. This includes fuel and equipment in adjacent countries that might be transported into Wanda or used in support of the Wanda operation.

h. The JPO begins coordination and discussion with DLA Energy regarding the amount of contract fuel support that could be available/needed in the operation.

i. Based on the initial estimates of contract support availability the JPO provides the components with the amount of military support that would be necessary. This includes fuel, equipment, transport, and personnel. The JPO directs the tactical movement of fuels by means available to components in the theater.

j. The JPO coordinates the unique capabilities of each Service with the joint planners. This becomes part of the appendix 1 (Petroleum, Oils, and Lubricants [POL] Supply) to annex D (Logistics) of the OPLANs.

k. The JPO integrates and applies the threat assessments and force protection measures in petroleum planning and operations. Special emphasis should be placed on ensuring adequate convoy protection, personnel protection, and protection of facilities.

l. The JPO ensures that the preceding information is used to develop fuel requirements, operations, and constraints that are then addressed in the bulk petroleum annex of the OPLANs.

m. The JPO plans and coordinates the receipt, storage, and distribution of petroleum products in coordination with DLA Energy and the Service component commanders.

n. The JPO ensures that the components and DLA Energy have a robust QS program.

o. The JPO makes an early assessment of the desirability of having a SAPO in the country of Wanda. Because of the span of control, data-gathering, and execution required, the JPO requests the GCC to appoint a SAPO with appropriate staff to fulfill bulk petroleum planning and execution matters in a section of the theater for which the JPO is responsible. The JPO considers the establishment of more than one SAPO in the theater. The SAPOs are normally required to:

(1) Conform to the administrative and technical procedures established by the CCDR and DOD 4140.25-M, *DOD Management of Bulk Petroleum Products, Natural Gas, and Coal Acquisition and Technology*.

(2) Be under the operational control of the CCDR or JFC JTF commander (if there is one).

p. The key duties and responsibilities outlined for the SAPO are to:

(1) Advise the JFC and staff on petroleum logistic planning and policy and provide to Service components and commands the JFC's petroleum logistic planning and policy.

(2) Prepare directives concerning the management, accountability, operation, and QA of petroleum activities in the JOA.

(3) Prepare petroleum input for JFC supporting plans and develop daily demand profiles and petroleum supply and distribution plans for OPLANs/OPORDs. State bulk petroleum requirements through the CCMD JPO to DLA Energy to obtain sourcing from DOD stocks, local commercial, or host government resources using DLA Energy contractual coverage or service/country fuel agreements.

(4) Establish direct communications with the CCMD JPO concerning all aspects of petroleum activities.

(5) State bulk petroleum requirements through the CCMD JPO to DLA Energy to obtain sourcing from DOD stocks, local commercial, or host government resources using DLA Energy contractual coverage or service/country fuel agreements.

(6) Submit a REPOL petroleum damage and deficiency report, as required, to the CCMD JPO.

(7) Assign JFC priorities and advise the CCMD JPO and DLA Energy about construction projects, maintenance, and repair projects for petroleum facilities.

(8) Validate the existing quantity and quality of local inventories, estimated DOS on hand, and method and quantity of daily resupply capability, by product.

(9) Coordinate and advise the CCMD JPO concerning local petroleum capabilities.

(10) Establish JFC requirements/coordinate with the JPO and DLA Energy for leased storage and related activities in the JOA.

(11) Coordinate with local commercial and host government to determine availability of commodity and capability to support bulk petroleum operational requirements.

(12) Identify/submit requirements IAW current HNS agreements to the HN for HN petroleum support.

(13) Supervise bulk petroleum operations. Coordinate with commercial sources and host governments for the use of tanker loading/off-loading facilities.

(14) Coordinate with the DLA Energy, CCMD JPO, and Service component bulk petroleum managers to maintain visibility of bulk petroleum operations.

(15) Maintain operational petroleum delivery requirements from Service component petroleum, oils, and lubricants managers to maintain visibility of bulk petroleum operations.

(16) Maintain operational petroleum delivery requirements from Service component petroleum managers.

(17) Consolidate component delivery requirements and forward them to DLA Energy.

(18) Coordinate QS and procurement inspection programs.

(19) Advise the JFC, under emergency conditions, on the allocation of petroleum, oils, and lubricants and facilities and coordinate with component control points.

(20) Release or reallocate JOA PWRS.

(21) Notify the CCMD J-4 and CCMD JPO when PWRS will be penetrated and provide a plan for reconstitution of levels, including a time frame when levels will be covered.

(22) Maintain thorough knowledge and understanding of JFC OPLANs/OPORDs and component and supporting forces CONOPS/support.

(23) Coordinate allocation and construction of inland petroleum distribution system assets.

(24) Provide broad guidance and supervision to the SAPO members.

q. With the proper consideration of planning factors, the establishment of roles and offices, and the coordination underway with components and SAPOs, the JPO is now ready to commence successful operations.

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APPENDIX D
WATER SCENARIO

This appendix provides a notional water scenario featuring actions and tasks a Joint Task Force (JTF) J-4 would perform during the initial stage of a contingency. The purpose of this scenario is for potential or current JTF J-4 personnel to become familiar with the steps required to plan and execute water operations during the early phases of a contingency.

1. **Situation.** You are part of the JTF J-4 for United States Africa Command (USAFRICOM). You have just been notified that an operation is being planned for the country of Wanda. Details of the operation follow.

2. **Mission.** The Secretary of Defense, by order of the President of the United States, directs the Commander, United States Africa Command (CDRUSAFRICOM), to plan and conduct an FHA operation in the country of Wanda, Africa. US forces will assist the Wanda military forces and government agencies, IGOs, and NGOs to accomplish the mission. It is anticipated that other allied nations will join this effort; however, the extent and timing of this assistance is uncertain. The US forces to be involved in this operation include US Air Force (one force projection wing and required transport aircraft), US Army (two brigades of the 82nd Airborne Division and appropriate support elements), US Navy amphibious ready group, and US Marine Corps (one Marine expeditionary unit). The Army is the lead service for providing common item support to this operation to include water support. The CDRUSAFRICOM has the predominant water responsibility within the theater, and this responsibility will be discharged by the JTF J-4. The USAFRICOM J-4/JTF J-4 works in conjunction with its Service components for the Wanda area to plan, coordinate, and oversee all phases of water support for US forces employed or planned for possible employment in the theater. The JTF J-4 will have a mix of Service representatives.

3. **Background.** Wanda is the most densely populated country in Africa and is located in Central Africa, east of Democratic Republic of Ongo. The capital of Wanda is Gali. Wanda is home to approximately 10.3 million people. Wanda is bordered by Urundi, Democratic Republic of Ongo, Zana, and Ganda. Wanda is a poor rural country with about 90% of the population engaged in (mainly subsistence) agriculture and some mineral and agro-processing. Tourism, minerals, coffee, and tea are Wanda's main sources of foreign exchange. The 1994 genocide decimated Wanda's fragile economic base, severely impoverished the population, particularly women, and temporarily stalled the country's ability to attract private and external investment.

4. **Geography**

a. Wanda has a temperate tropical highland climate, with lower temperatures than are typical for equatorial countries due to its high elevation. Gali, in the center of the country, has a typical daily temperature range between 12 °C (54 °F) and 27 °C (81 °F), with little variation through the year. Wanda is a temperate climate with two rainy seasons (February to April and November to January), and with mild temperatures in

Overview map of Wanda surrounding area.

mountains with frost and possible snow. The terrain is mostly grassy, with uplands and hills. Wanda is slightly smaller than Maryland. Gali is supplied with, on average, 1028 mm (40.5 in) of rainfall per year, or 85.7 mm (3.4 in) per month. On average, there are 122 days per year with more than 0.1 mm (0.004 in) of rainfall (precipitation) or 10.2 days with a quantity of rain, sleet, snow, etc. per month. The driest weather is in July, when an average of 9 mm (0.4 in) of rainfall (precipitation) occurs. The wettest weather is in April, when an average of 183 mm (7.2 in) of rainfall (precipitation) occurs.

b. Wanda has been characterized by significant civil and political unrest for the past 50 years. This unrest, coupled with living conditions, has resulted in the loss of an estimated one million lives during this time. The infrastructure in the nation has not kept pace with the population growth and demands, and has contributed to significant shortages of water, food, and medical care. Recent events have highlighted the severity of the situation and led the President to order an FHA operation.

5. **Water Infrastructure.** Water supply and sanitation in Wanda is characterized by a clear government policy and significant donor support. The country of Wanda has poor

sustainability of rural water systems and poor service quality. In urban areas, the public utility, Energy, Water, and Sanitation Group (EWSG) is in charge of water supply.

6. **Distribution and Storage.** Being landlocked, the country depends on road, rail, or air transport, although pipelines are used for moving large volumes of water. The main supply route runs from Mombasa to Nairobi in Kenya by a 485-kilometers (km) pipeline and on to Gali (via Ganda) by tank trucks, along a 1,250-km road route. Alternative routes exist from Nairobi to Tanzania; Dar-es-Salaam to Gali; or by rail from Dar-es-Salaam to Tabora and Isaka, and then by road from Isaka to Gali (600 km). Because of high transport costs, insecurity of supply, and low income levels, the population relies heavily on traditional water sources.

7. **Water Sources**

a. Wanda water sources are surface water (rivers, ponds, lakes, springs), groundwater wells, and even HN municipal water systems that can be accessed and treated using Army water purification equipment to produce potable drinking water. Their main river is the Byamugogo, highly loaded with contaminants that cause an environmental risk to the receiving Gpazi River. The average total dissolved solids (TDS) is approximately 10,000 parts per million (ppm) and the turbidity ranges between 50 and 60 nephelometric turbidity units (NTU) for this country's water sources.

b. Wanda has abundant rainfall and water resources, totaling 5 billion cubic meters per year (177 billion cu ft/yr). However, deforestation and erosion affect the productivity of springs, which are the main source of water supply in rural areas. Wanda has 22,300 springs registered in a spring inventory. Total water use was estimated at 150 million cubic meters per year (5.3 billion cu ft/yr) in 2000, of which 24% (36 million m^3/year or 1.27 billion cu ft/year) was for domestic uses, corresponding to only 4 cubic meters per capita, per year or about 11 liters per capita, per day (140 cu ft/capita/yr or about 3 U.S. gallons or 2½ imperial gallons/capita/day). Another source estimates total water use at 800 million cubic meters per year (28 billion cu ft/yr) in 1993, of which 5% (40 million m^3/yr or 1.4 billion cu ft) were for domestic uses.

8. **Host Nation Water Infrastructure**

a. The Ministry of Lands, Environment, Forests, and Water, through its water and sanitation directorate (Direction de l'eau et de l'assainissement), is in charge of determining water policies and strategies in Wanda. It is also in charge of monitoring drinking water quality and promoting user awareness.

b. Water infrastructure in Wanda consisted of 15 urban, and about 766 rural, water systems. Urban water systems are fed by water from 17 water treatment plants. Rural water systems mainly feed standpipes. Hand pumps using groundwater and managed springs provide water separately from water systems. Some rural water systems are large and complex. For example, in 2001 there were 50 water systems that spanned more than one district and 10 water systems that spanned more than one province. The largest one serves 120,000 users in villages several miles apart. Although these systems are "piped,"

this typically means that water is distributed to water points in the village where users must go to retrieve water. Public-private partnership is currently bolstering the country's water infrastructure to provide better drinking water to the country's communities. The country's current infrastructure does not support the country's population's need for clean and safe drinking water. About half of rural water schemes did not function in 2004, according to an extensive field survey.

c. Wanda has two water bottle plants. The larger of the two is located south of the capital in the city of Zentare. This large facility can produce 1,000,000 bottles of water per day. The second bottled water manufacturer can only produce approximately 30,000 bottles of water and is located in the city of Yumba, northwest of the country's capital.

9. **Solution**

a. As per DODD 4705.01E, *Management of Land-Based Water Resources in Support of Contingency Operations*, the Secretary of the Army is designated as the DOD executive agent for land-based water resources. The Deputy Chief of Staff, G-4 (DCS, G-4) is designated the Army staff proponent for land-based water resource matters in support of contingency operations, and is delegated the authority to act on behalf of the Secretary of the Army for any or all of the DOD executive agent responsibilities, functions, and authorities. CDRUSAFRICOM has the predominant water responsibility within the theater, and this responsibility is discharged by the JTF J-4. The JTF J-4 works in conjunction with its Service components to plan, coordinate, and oversee all phases of water support for US forces employed or planned for possible employment in the theater.

b. One of the early tasks of the JTF J-4 is to establish the lead Service or agency responsible for water support for joint operations. Since the Army is going to have a major force on the ground and is designated as the DOD executive agent for land-based water operations, the Army will be the lead Service.

c. The Army will provide planning and information resources for use in this operation. Planning for water support begins with determining the amount of water required. This will depend on mission guidance from the tactical commander, mission scope, mission duration, stage of operation, operational environment, CBRN capabilities, and size of the force. There is no formal supply accountability for water. In regions with an extreme environment, the commander may issue water restriction guidance to conserve and prioritize water supplies. All levels of command must be concerned with the quantity and quality of water. The JTF J-4 will consult the following resources:

(1) The Army Geospatial Center (AGC) website can assist in determining raw water source. The AGC hydrologic analysis team maintains a water resource database that provides information on quality, quantity, and availability of water resources in areas of the world of interest to DOD. The AGC water detection response team is the DOD's prime organization for assisting military well drillers, whether for military,

humanitarian, or nation-building activities. Its primary function is to assist and advise well-drilling teams on the location of the best well-drilling sites and depths, and to provide information on drilling conditions for logistical planners.

(2) The Combined Arms Support Command planning data branch website contains an operational logistics (OPLOG) planning tool, used to determine water consumption requirements. The OPLOG planner is the Army's program of record for water planning. The water planning guide contains all feeder data pertaining to water planning factors that are used in automated systems.

(3) The Army force management system website (FMSWEB), and the Army equipping enterprise system website, are two resources that can be used to determine unit organic capabilities. The force management system website contains unit requirement and authorization documents for all Army units, which includes personnel and equipment. The Army equipping enterprise system contains current unit on-hand capabilities for both personnel and equipment.

d. The Army will plan for the sanitary control and surveillance of field water supplies and water sources reconnaissance in support of the operational mission.

(1) Preventive medicine (PVNTMED) personnel will perform surveys by using field observations and equipment to perform water source reconnaissance and to screen potential raw water sources based on reverse osmosis (RO)-based water purification system (WPS) (or other available treatment system) capabilities.

(2) The Army will ensure that PVNTMED personnel certify that water purified at field water purification points is potable, based on comparing the results of basic testing to the Tri-Service Field Water Standards (TSFWS).

(3) The Army will check the availability of partially or completely intact municipal water systems and ground or surface water wells that are sometimes available for use as water sources during military operations.

(a) Partially or completely intact municipal water systems are sometimes available for use as water sources during deployments. IAW Army TB MED577/NAVMED P-5010-10/AFMAN 48-138_IP, *Sanitary Control and Surveillance of Field Water Supplies*, such systems are referred to as semi-fixed or host nation water supplies. Despite the ease of access and possible presumption that the water in these systems has been treated and is potable, the water in them is by Army doctrine considered non-potable until PVNTMED personnel have inspected the systems, tested the water, and approved it for use. While these types of water sources may be appealing, the local water treatment methods may be less than adequate, inconsistent, and unreliable, and the water may become contaminated after it is treated through broken water lines or cross-connections in the storage and distribution systems that are not readily visible.

(b) Even if the local population appears healthy, they may have developed immunities to microbiological contaminants and tolerances for chemical impurities in

their water through long periods of exposure. The same contaminants could cause severe adverse health effects in un-acclimatized deployed personnel, and reduce unit readiness. The water may also have contaminants that have the potential to increase long-term health risks to deployed personnel. Further, in areas of civil unrest, the threat of intentional contamination of the local drinking water system by disgruntled local nationals or terrorist groups must be considered.

(c) The senior preventive medicine SM on the ground will ensure that water sources and water wells are checked by Corps of Engineers and Preventive Medicine to determine whether they are safe for consumption and a viable water source to support military operations. The Engineers have a water detection response team (WDRT) that is the DOD's prime organization for assisting military well drillers, whether for military or humanitarian, or nation-building activities. If current water wells can't support the operation or are unsafe, a staff of groundwater experts is available on-call to provide information and assistance, and to produce studies for military well-drilling-related activities. The team possesses an inventory of state-of-the-art remote sensing and geophysical equipment, and has numerous bibliographic sources readily available for most areas of the world. The WDRT also offers a Hydrogeology for Military Well Drillers short course upon request.

(4) The senior preventive medicine SM on the ground will check the availability of bottled water facilities. Bottled water is frequently used as a means of providing potable drinking water to deployed troops around the world. It is readily available and offers flexibility to planners. In some cases, it has been linked to Service member morale as a perceived quality-of-life issue by offering convenience and good taste compared to RO-based WPS-treated water. The use of bottled water may reduce the required force structure in a theater, particularly early on, by partially or completely eliminating requirements for potable water production and distribution units. Bottled water is frequently used extensively throughout a deployment in spite of the tremendous stress it places on transportation and waste disposal operations. An expanded discussion is available in US Army Center for Health Promotion and Preventative Medicine, Water Quality Information Paper Number 31-034, *Use of Bottled Water for Deployment Support.*

(a) The military must approve all bulk sources of bottled water intended for consumption by deployed personnel. Army Veterinary Services (VS) personnel inspect and approve bottling facilities to ensure compliance with acceptable sanitation standards. They submit source and product water samples to an accredited laboratory for testing according to Title 21, CFR, Part 165 prior to initial approval. VS personnel also perform periodic sanitary inspections of approved bottling facilities according to MIL-STD 3006A, *Department of Defense Standard Practice: Sanitation Requirements for Food Establishments.*

(b) IAW Army TB MED577/NAVMED P-5010-10/AFMAN 48-138_IP, *Sanitary Control and Surveillance of Field Water Supplies*, quartermaster personnel may begin issuing bottled water from VS approved sources upon receipt. However,

PVNTMED personnel are required to monitor bottled water quality initially and periodically at three levels of storage and distribution.

(5) The senior preventive medicine SM on the ground will establish a timeline for the provision of water.

(6) The senior preventive medicine SM on the ground will determine the availability of commercial transportation.

(7) The senior preventive medicine SM on the ground will establish a timeline for the availability of commercial transportation.

(8) The senior preventive medicine SM on the ground will determine the amount of water that can be transported per day, by each transport mode (pipeline, truck, etc.).

(9) The senior preventive medicine SM on the ground will assess the availability of commercial storage—where, how much, when can it be available?

e. The Army will request and conduct in country reconnaissance.

f. The Army will provide water logistic planning and policy guidance to the component commanders. This is not an easy task given the isolated location of Wanda and the apparent scarcity of water resources. Major issues that are a top priority for information gathering are as follows:

(1) Each component is asked to do a projection of daily water requirements for the first 30 days of the operation.

(2) The components validate the component water requirements, as nearly as feasible.

(3) The JTF J-4 considers the support that might be required for the support of other US Government departments and agencies, IGOs, and NGOs in accomplishment of this mission. Requirements are solicited from these organizations.

(4) The task force must consider that at some time in the future support might be necessary for forces from other nations who will join this effort even though the extent and timing of this assistance is uncertain. Since a tentative list of possible nations exists, the JTF J-4 staff starts to coordinate and negotiate multinational water support.

(5) The Army determines whether there are any existing contracts in the area.

(6) The Army researches the available contracts in adjacent countries or theaters to support this contingency.

(7) The Army identifies available commercial resources such as transportation, storage, and quality testing, that might be put under contract.

(8) The Army determines what theater war reserves are available for use. The release or reallocation of these resources are addressed in the OPLANs.

(9) The Army requests that components estimate what tactical equipment must be sent into Wanda to support the operation.

(10) The Army establishes contracts in Wanda for water and looks at adjacent countries for water and transportation assets that could be contracted to support the operation.

(11) Conducts ally inquires what, if any, Wanda government or military resources are available that might be made available through an HNS contract or other agreement.

(12) Based on the information above, the JTF J-4 considers what water assets must be moved by air to support the initial stages of the operation.

g. Contacts the American Embassy in-country team to explore possible HNS. If available, the appropriate organization should negotiate, in coordination with formal HNS agreements. This includes water and equipment in adjacent countries that might be transported into Wanda or used in support of the Wanda operation.

h. The JTF J-4 begins coordination regarding the amount of contract water support that could be available/needed in the operation.

i. Based on the initial estimates of contract support availability, the JTF J-4 provides the components with the amount of military support that would be necessary. This includes water, equipment, transport, and personnel. The JTF J-4 directs the tactical movement of water by means available to components in the theater.

j. The Army coordinates the unique capabilities of each service with the joint planners. This becomes part of the joint subsistence, food service support, and water management appendix of the OPLANs.

k. The Army integrates and applies the threat assessments and force protection measures in water planning and operations. Special emphasis should be placed on ensuring adequate convoy protection, personnel protection, and protection of facilities.

l. The Army ensures that the preceding information is used to develop water requirements and operations, and that constraints are addressed in the joint subsistence, food service support and water management appendix of the OPLANs.

m. The Army plans and coordinates the receipt, storage, and distribution of water products in coordination with and the Service component commanders.

n. The Army ensures that the components have a robust water quality program with constant monitoring by PVNTMED personnel.

o. Other key duties and responsibilities outlined for the Army's petroleum and water branch are to:

(1) Advise the JFC on water logistic planning and policy and provide to Service components and commands the JFC's water logistic planning and policy.

(2) Prepare directives concerning the management, accountability, operation, and quality analysis of water activities in the JOA.

(3) Prepare water input for JFC supporting plans and develop daily demand profiles and water supply and distribution plans for OPLANs/OPORDs. State water requirements through the CCMD staff to obtain sourcing from DOD stocks, local commercial, or host government resources using contractual coverage or service/country water agreements.

(4) Establish a direct LOC with the CCMD concerning all aspects of water activities.

(5) State water requirements through the CCMD staff, to obtain sourcing from DOD stocks, local commercial, or host government resources using contractual coverage or service/country water agreements.

(6) Assign JFC priorities and advise the CCMD for construction projects, maintenance, and repair projects for water facilities.

(7) Validate existing quantity and quality of local inventories, estimated days of supply on hand, and method and quantity of daily resupply capability by potable and non-potable water.

(8) Coordinate and advise the JTF CDR concerning local water capabilities.

(9) Establish JFC requirements/coordinate with the Petroleum & Water Branch for leased storage and related activities in the JOA.

(10) Coordinate with local commercial and host government to determine availability of commodity and capability to support water operational requirements.

(11) Identify/submit requirements IAW current host nation service agreements to the host nation for support.

(12) Coordinate with the CCMD staff and service component water managers to maintain visibility of water operations.

(13) Maintain operational water delivery requirements from service component water managers to maintain visibility of water operations.

(14) Consolidate component delivery requirements and forward them to CCMD staff.

(15) Coordinate water quality monitoring and procurement inspection programs.

(16) Advise the JFC, under emergency conditions, on the allocation of water facilities, and coordinate with component control points.

(17) Release or reallocate JOA PWRS.

(18) Notify CCMD J-4 staff when PWRS will be penetrated and provide a plan for reconstitution of levels including a time frame when levels will be covered.

(19) Maintain thorough knowledge and understanding of JFC OPLANs/OPORDs and component and supporting forces CONOPS/support.

(20) Coordinate allocation and construction of inland water distribution system assets.

(21) Provide broad guidance and supervision to the water team members.

10. **Conclusion**

a. Organizations and staffs at the strategic, operational, and tactical echelons enable water support operations. An understanding of the various roles and responsibilities of strategic partners and at each echelon will help water planners gain a comprehensive understanding of the water supply chain. Many factors influence the supply of potable drinking water to deployed service members. In order to sustain deployed forces with safe drinking water, it is imperative to integrate several stakeholders and enablers:

b. Army. The Secretary of the Army is the DOD executive agent for management of land-based water resources in support of contingency operations per DOD Directive 4705.01E, *Management of Land-Based Water Resources in Support of Contingency Operations*.

c. Army Geospatial Center (AGC). The AGC is a major subordinate command under the Army Corps of Engineers. AGC coordinates, integrates, and synchronizes geospatial information requirements and standards across the Army. When it comes to water, AGC's expertise encompasses hydrological algorithms and decision aids; systems for hydro reasoning and management; ground, surface, and man-made hydrological data capture, production, management, analysis, and distribution; hydrological model visualization; electronic navigation; and water management systems.

d. Army Medical Department (AMEDD). The Army Medical Department is responsible for operational management of the Army Health System, which includes all services performed in support of the health service support and force health protection missions. Force health protection encompasses the preventive aspects of the Army's medical functions and the preventive medicine (PVNTMED) programs and services designed to counter the health threats faced by US military forces. Preventive medicine and Army veterinary services personnel provide water quality surveillance inspections to

ensure compliance with established military water quality standards and prevention of waterborne illnesses and diseases.

For additional information, refer to JP 4-02, Health Services*; and Army TB MED577/NAVMED P-5010-10/AFMAN 48-138_IP,* Sanitary Control and Surveillance of Field Water Supplies.

e. ASAALT (Assistant Secretary of The Army for Acquisition, Logistics, and Technology). ASAALT oversees the program executive office which supervises the product manager (PM) for water systems for the Army. The PM for water systems works with original equipment manufacturers to design and develop new material solutions that fill water capability gaps.

f. Army Materiel Command, TACOMLCMC (Tank-Automotive and Armaments Life Cycle Management Command), and ILSC (Integrated Logistics Support Center). Army Materiel Command is the Army's lead materiel integrator and provides technology, acquisition support, materiel development, logistics power projection, and sustainment support. The item managers field or deploy water systems to Army units and Army stocks based on authorizations and operational requirements.

g. Operational HQ at echelons above brigade and sustainment HQ at echelons above brigade. Water materiel management functions are performed at the TSC, expeditionary sustainment command (ESC), and sustainment brigade HQ. Sustainment brigades provide mission command of operational missions of the TSC and ESC.

h. Defense Logistics Agency (DLA). DLA is the DOD strategic logistics provider and provides support for supply classes I, II, III, IV, VI, VII, VIII, and IX. DLA supports each geographic combatant command with a DLA support team that coordinates DLA activities throughout a theater of operations. DLA procures all water treatment chemicals, some water treatment system components, and some water treatment system replacement parts from commercial businesses that make up DOD's industrial base.

i. Host Nation. For the field water support mission, strategic-level coordination and establishing agreements with the host nation is required. It is also important to identify host nation water resource support, and threats to host nation water sources and water supplies during staff planning.

j. Available military treatment and storage and distribution systems.

k. Contracting support. DLA may develop vendor contracts for packaged water support.

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APPENDIX E
REFERENCES

The development of Joint Publication (JP) 4-03 is based upon the following primary references:

1. Department of Defense Publications

a. DOD 4140.25-M, *DOD Management of Bulk Petroleum Products, Natural Gas, and Coal Acquisition and Technology.*

b. DOD 4715.05-G, *Overseas Environmental Baseline Guidance Document.*

c. DODD 3000.10, *Contingency Basing Outside the United States.*

d. DODD 4140.25, *DOD Management Policy for Energy Commodities and Related Services.*

e. DODD 5101.8, *DOD Executive Agent (DOD EA) for Bulk Petroleum.*

f. DODD 5530.3, *International Agreements.*

g. DODI 3110.06, *War Reserve Materiel (WRM) Policy.*

h. DODI 4705.01E, *Management of Land-Based Water Resources in Support of Contingency Operations.*

i. DODI 4715.05, *Environmental Compliance at Installations Outside the United States.*

2. Chairman of the Joint Chiefs of Staff Publications

a. Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3110.01H, *2010 Joint Strategic Capabilities Plan (JSCP).*

b. CJCSI 3150.25E, *Joint Lessons Learned Program.*

c. CJCSM 3130.03, *Adaptive Planning and Execution (APEX) Planning Formats and Guidance.*

d. CJCSM 3150.14B, *Joint Reporting Structure Logistics.*

e. JP 3-28, *Defense Support of Civil Authorities.*

f. JP 4-0, *Joint Logistics.*

g. JP 4-01.6, *Joint Logistics Over-the-Shore.*

h. JP 4-08, *Logistics in Support of Multinational Operations.*

3. Other Publications

a. Joint Petroleum Logistics Planning Guide, October 2012.

b. MIL-STD-3004D, *Quality Assurance/Surveillance for Fuels, Lubricants, and Related Products.*

c. DLA Energy-Environmental Guide Fuel Terminal.

d. DLA Memorandum to DESC, 1 November 2004.

e. DLA Instruction Number: DLA Energy P-9, 22 September, 2011.

f. Field Manual (FM) 3-93, *Theater Operations.*

g. FM 4-94, *Theater Sustainment Command.*

APPENDIX F
ADMINISTRATIVE INSTRUCTIONS

1. User Comments

Users in the field are highly encouraged to submit comments on this publication to: Joint Staff J-7, Deputy Director, Joint Education and Doctrine, ATTN: Joint Doctrine Analysis Division, 116 Lake View Parkway, Suffolk, VA 23435-2697. These comments should address content (accuracy, usefulness, consistency, and organization), writing, and appearance.

2. Authorship

The lead agent and Joint Staff doctrine sponsor for this publication is the J-4.

3. Supersession

This publication supersedes JP 4-03, *Joint Bulk Petroleum and Water Doctrine*, 9 December 2010.

4. Change Recommendations

a. Recommendations for urgent changes to this publication should be submitted:

TO: JOINT STAFF WASHINGTON DC//J7-JED//

b. Routine changes should be submitted electronically to the Deputy Director, Joint Education and Doctrine, ATTN: Joint Doctrine Analysis Division, 116 Lake View Parkway, Suffolk, VA 23435-2697, and info the lead agent and the Director for Joint Force Development, J-7/JED.

c. When a Joint Staff directorate submits a proposal to the CJCS that would change source document information reflected in this publication, that directorate will include a proposed change to this publication as an enclosure to its proposal. The Services and other organizations are requested to notify the Joint Staff J-7 when changes to source documents reflected in this publication are initiated.

5. Distribution of Publications

Local reproduction is authorized, and access to unclassified publications is unrestricted. However, access to and reproduction authorization for classified JPs must be IAW DOD Manual 5200.01, Volume 1, *DOD Information Security Program: Overview, Classification, and Declassification*, and DOD Manual 5200.01, Volume 3, *DOD Information Security Program: Protection of Classified Information.*

6. Distribution of Electronic Publications

a. Joint Staff J-7 will not print copies of JPs for distribution. Electronic versions are available on JDEIS Joint Electronic Library Plus (JEL+) at https://jdeis.js.mil/jdeis/index.jsp (NIPRNET) and http://jdeis.js.smil.mil/jdeis/index.jsp (SIPRNET), and on the JEL at http://www.dtic.mil/doctrine (NIPRNET).

b. Only approved JPs are releasable outside the combatant commands, Services, and Joint Staff. Defense attachés may request classified JPs by sending written requests to Defense Intelligence Agency (DIA)/IE-3, 200 MacDill Blvd., Joint Base Anacostia-Bolling, Washington, DC 20340-5100.

c. JEL CD-ROM. Upon request of a joint doctrine development community member, the Joint Staff J-7 will produce and deliver one CD-ROM with current JPs. This JEL CD-ROM will be updated not less than semi-annually and when received can be locally reproduced for use within the combatant commands, Services, and combat support agencies.

GLOSSARY

PART I—ABBREVIATIONS AND ACRONYMS

ABFDS	aerial bulk fuel delivery system
ACSA	acquisition and cross-servicing agreement
AFMAN	Air Force manual
AMC	Air Mobility Command
AOR	area of responsibility
ASD(OEPP)	Assistant Secretary of Defense for Operational Energy Plans and Programs
BPA	blanket purchase agreement
CBRN	chemical, biological, radiological, and nuclear
CCDR	combatant commander
CCMD	combatant command
CJCS	Chairman of the Joint Chiefs Staff
CJCSI	Chairman of the Joint Chiefs of Staff instruction
CJCSM	Chairman of the Joint Chiefs of Staff manual
CONOPS	concept of operations
CONPLAN	concept plan
COP	common operational picture
COR	contracting officer representative
DLA	Defense Logistics Agency
DOD	Department of Defense
DODD	Department of Defense directive
DODI	Department of Defense instruction
DOS	days of supply
EA	executive agent
FGS	final governing standard
FM	field manual (Army)
FORCE	fuels operational readiness capability equipment (Air Force)
FSSP	fuel system supply point
GCC	geographic combatant commander
HN	host nation
HNS	host-nation support
HQ	headquarters
IAW	in accordance with
ICIS	integrated consumable item support
IFO	intermediate fuel oil

IGO	intergovernmental organization
IMM	integrated materiel management
IMP	inventory management plan
IPDP	inland petroleum distribution plan
IPDS	inland petroleum distribution system (Army)
JFC	joint force commander
JLEnt	joint logistics enterprise
JLOTS	joint logistics over-the-shore
JMPAB	Joint Materiel Priorities and Allocation Board
JOA	joint operations area
JP	joint publication
JPO	joint petroleum office
JS	Joint Staff
LOC	line of communications
LSA	logistics supportability analysis
MILCON	military construction
MILSPEC	military specification
MIL-STD	military standard
MNF	multinational force
MPF	maritime pre-positioning force
MSC	Military Sealift Command
NAVMED	Navy medicine
NGO	nongovernmental organization
OPDS	offshore petroleum discharge system (USN)
OPLAN	operation plan
OPORD	operation order
OS	operating stocks
OSD	Office of the Secretary of Defense
PC&S	post, camp, and station
POLCAP	bulk petroleum capabilities report
PWRR	pre-positioned war reserve requirements
PWRS	pre-positioned war reserve stock
QA	quality assurance
QS	quality surveillance
REPOL	bulk petroleum contingency report
RIK	replacement in kind
SAPO	subarea petroleum office

SCP	service control point
SEA	ships' bunkers easy acquisition
SFC	single-fuel concept
SRM	sustainment, restoration, and modernization
TB MED	technical bulletin medical
TPFDD	time-phased force and deployment data
TSC	theater sustainment command (Army)
USA	United States Army
USAF	United States Air Force
USD(AT&L)	Under Secretary of Defense for Acquisition, Technology, and Logistics
USMC	United States Marine Corps
USN	United States Navy
USTRANSCOM	United States Transportation Command
WHNS	wartime host-nation support

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PART II—TERMS AND DEFINITIONS

bulk petroleum product. A liquid petroleum product transported by various means and stored in tanks or containers having an individual fill capacity greater than 208 liters. (Approved for incorporation into JP 1-02.)

bulk storage. 1. Storage in a warehouse of supplies and equipment in large quantities, usually in original containers, as distinguished from bin storage. 2. Storage of liquids, such as petroleum products in tanks, as distinguished from drum or packaged storage. (JP 1-02. SOURCE: JP 4-03)

inland petroleum distribution system. A multi-product system consisting of both commercially available and military standard petroleum equipment that can be assembled by military personnel and, when assembled into an integrated petroleum distribution system, provides the military with the capability required to support an operational force with bulk fuels. Also called **IPDS.** (Approved for incorporation into JP 1-02.)

integrated consumable item support. A decision support system that takes time-phased force and deployment data and calculates the ability of the Defense Logistics Agency to support those plans. Also called **ICIS.** (Approved for incorporation into JP 1-02.)

materiel readiness. None. (Approved for removal from JP 1-02.)

offshore petroleum discharge system. Provides bulk transfer of petroleum directly from an offshore tanker to a beach termination unit located immediately inland from the high watermark. Also called **OPDS.** (Approved for incorporation into JP 1-02.)

operating stocks. Fuel required to sustain daily operations and ensure fuel availability to support United States military forces worldwide. Also called **OS.** (Approved for inclusion in JP 1-02.)

packaged petroleum product. None. (Approved for removal from JP 1-02.)

peacetime operating stocks. None. (Approved for removal from JP 1-02.)

pre-positioned war reserve materiel requirement, balance. None. (Approved for removal from JP 1-02.)

pre-positioned war reserve materiel requirement, protectable. None. (Approved for removal from JP 1-02.)

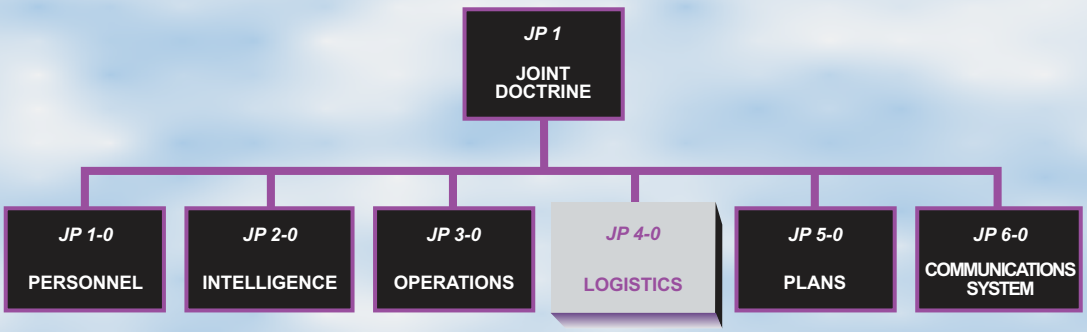
pre-positioned war reserve stock. The assets that are designated to satisfy the pre-positioned war reserve materiel requirement. Also called **PWRS.** (Approved for incorporation into JP 1-02 with JP 4-03 as the source JP.)

receiving ship. Ship in a replenishment unit that receives the rig(s). (JP 1-02. SOURCE: JP 4-03)

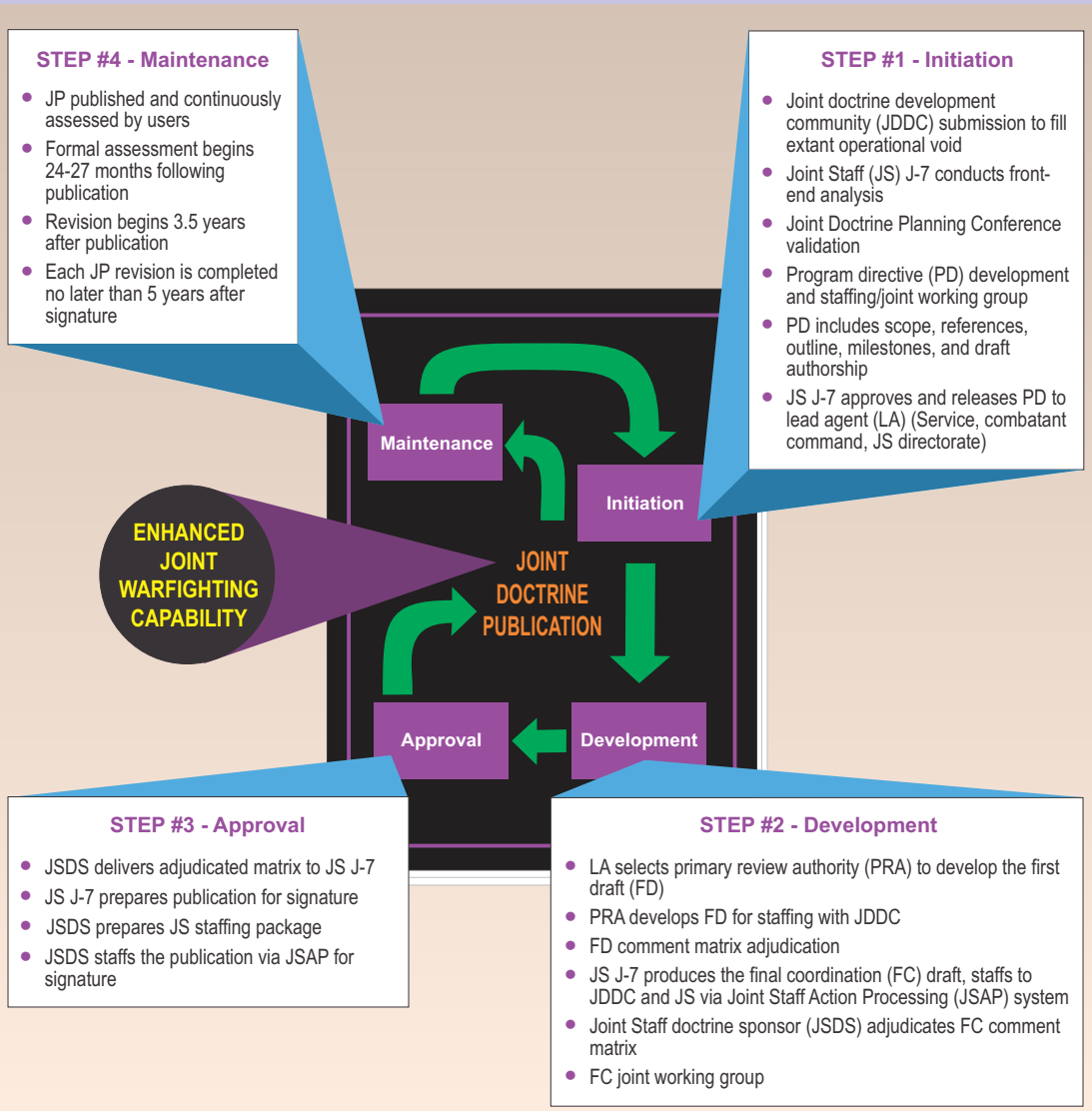
sustainment, restoration, and modernization. The fuels asset sustainment program within Defense Logistics Agency Energy that provides a long-term process to cost-effectively sustain, restore, and modernize fuel facilities. Also called **SRM.** (Approved for incorporation into JP 1-02)

tactical airfield fuel dispensing system. None. (Approved for removal from JP 1-02.)

JOINT DOCTRINE PUBLICATIONS HIERARCHY



All joint publications are organized into a comprehensive hierarchy as shown in the chart above. **Joint Publication (JP) 4-03** is in the **Logistics** series of joint doctrine publications. The diagram below illustrates an overview of the development process:



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