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FUEL MANAGEMENT ASHORE

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FUEL MANAGEMENT ASHORE
NAVSUP Publication 558
Revision 1

NAVY DEPARTMENT
NAVAL SUPPLY SYSTEMS COMMAND
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This publication provides a consolidation of policies, guidance and direction on all aspects of fuel management ashore. Questions or comments pertaining to the information contained in this publication should be addressed to the Naval Supply Systems Command, Navy Fuel Management System (SUP 40).

Revision 1 supersedes the January 1987 Edition.

Copies may be ordered in accordance with procedures established in MILSTRIP/MILSTRAP (NAVSUP Publication 437) and in the Unabridged Navy Index of Publications and Forms (NAVSUP Publication 2002D). The COG 0I Stock Number is shown on the publication cover.

R. M. MOORE
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INTRODUCTION

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CHAPTER ONE: INTRODUCTION

1.1 PURPOSE

This publication provides petroleum managers and operators with the necessary guidelines, general knowledge and references to operate and maintain petroleum facilities. It also is intended to be a guide for trainees and new personnel that provides an overall understanding of petroleum receipt, storage, issue, and maintenance procedures.

1.2 BACKGROUND

The need for a comprehensive manual to delineate petroleum management responsibilities in the U.S. Navy has been demonstrated repeatedly by technical assistance visits, Navy audits and IG inspections. Management of a petroleum facility is complex and managers must rely on the vast array of fuel-related publications that exist. With no single ready reference, it has been difficult for fuel facility managers to determine the correct course of action in both routine and crisis situations. Managers frequently relied on experience and intuitive judgment, without any assurance that their orders were suitable or conformed to all applicable regulations. This manual is intended to help managers understand their responsibilities and locate information vital to the proper management of an ashore Navy fuel facility.

1.3 SCOPE

This publication provides ashore petroleum management policy, guidance and direction. For detailed information and guidance, appropriate references are noted and should be consulted. This manual is applicable to and has been structured to cover all major facets of retail and wholesale petroleum management ashore within the U.S. Navy. CINCLANTFLT/ CINCPACFLTINST 4026.1 (Fuel Management Afloat Manual) is the comparable manual for fuel management afloat. Acronyms and references used throughout this manual are listed in Appendices 1 and 2, respectively.

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Chapter Two: OPERATIONS

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CHAPTER TWO: OPERATIONS

2.1 INTRODUCTION

The mission of all Navy fuel activities is to provide on-specification petroleum products to customers in a timely manner. Fuel activities must be able to safely and efficiently receive, store and issue petroleum products, with appropriate controls to ensure adequate quality and inventory. In order to maintain adequate controls and operate efficiently, each fuel activity must establish guidelines that provide personnel with the information necessary to maintain efficient operations and to meet Federal, Navy and industry safety and environmental standards. This chapter provides the information needed to organize a fuel facility, develop a facility operations manual, and to develop appropriate operations orders, logs and records necessary to an efficient petroleum management function.

2.2 REFERENCES

These reference documents contain standards, establish procedures and reflect requirements pertinent to conducting an efficient fuel operation. Each should be maintained in the Fuel Department and reviewed, in detail, on a periodic basis.

33 CFR 154	Oil Pollution Regulations for Marine Transfer Facilities
40 CFR 112	Oil Pollution Prevention
DOD 4140.25M	DOD Management of Bulk Petroleum Products, Natural Gas, and Coal
OPNAVINST 4020.25	Control and Accountability for Ground Fuels
OPNAVINST 5090.1	Environmental and Natural Resources Protection Manual
OPNAVINST 5530.14	Department of the Navy Physical Security and Loss Prevention
NAVSUP P-485, Vol. II	Supply Procedures Ashore
NAVSUPINST 4355.5	Petroleum Procurement Quality Assurance Manual
NAVPETOFFINST 4100.1	Fuel Reclamation

Additional references which provide valuable guidance relevant to fuel facility operations are:

MIL-HDBK-200	Quality Surveillance Handbook for Fuel, Lubricants and Related Products
MIL-HDBK-210	Conversion Factors and Logistics Data for Petroleum Planning
NAVFAC MO-230	Maintenance Manual Petroleum Fuel Facilities
NAVAIR 00-80T-109	Aircraft Refueling NATOPS Manual
COMSCINST 3121.3	Tanker Operating Instruction (TANKOPINS)
NAVPETOFFINST 10340.1	Drumming Procedures
NAVSUPINST 12410.16	Guidance for Competency Based Certification (CBC) Training Program
NAVEDTRA 43288A	Personnel Qualification Standard for Aviation Fuel Operations Ashore

2.3 ORGANIZATION

Fuel organizations vary in size, complexity and type but can be classified as either a Defense Fuel Support Point (DFSP) that receives, stores issues and accounts for product at the wholesale level, or a Naval Air Station/Facility which receives, stores, issues and accounts for products at the retail level. The DFSP, or terminal activity, handles large volumes of product and may be seen as the intermediate storage point between commercial facilities and activities such as Naval Air Stations, Navy ships and other consumers of fuel products. Basic organizational structures of various activities are provided as exhibits within this chapter.

2.3.1 Defense Fuel Support Point Personnel

Director: This position is generally filled by a Navy Supply Corps Officer of a rank commensurate with the responsibilities and functions of the fuel facility. The Director provides management and direction to facility operations, delegates authority as required to meet mission functions, and directly supervises staff personnel for administration, planning, budget and training in support of the primary mission.

Deputy Director. This position may vary with the size and complexity of the terminal, but it is occupied by the person authorized to act in the Director's absence. The Deputy Director's primary activity is to manage the long-range programs and funding issues.

Operations Foreman. The position of Foreman or General Foreman again will depend on the size and complexity of the

organization. The Operations Foreman is responsible for direct supervision of those activities associated with the receipt, issue and storage of the petroleum products.

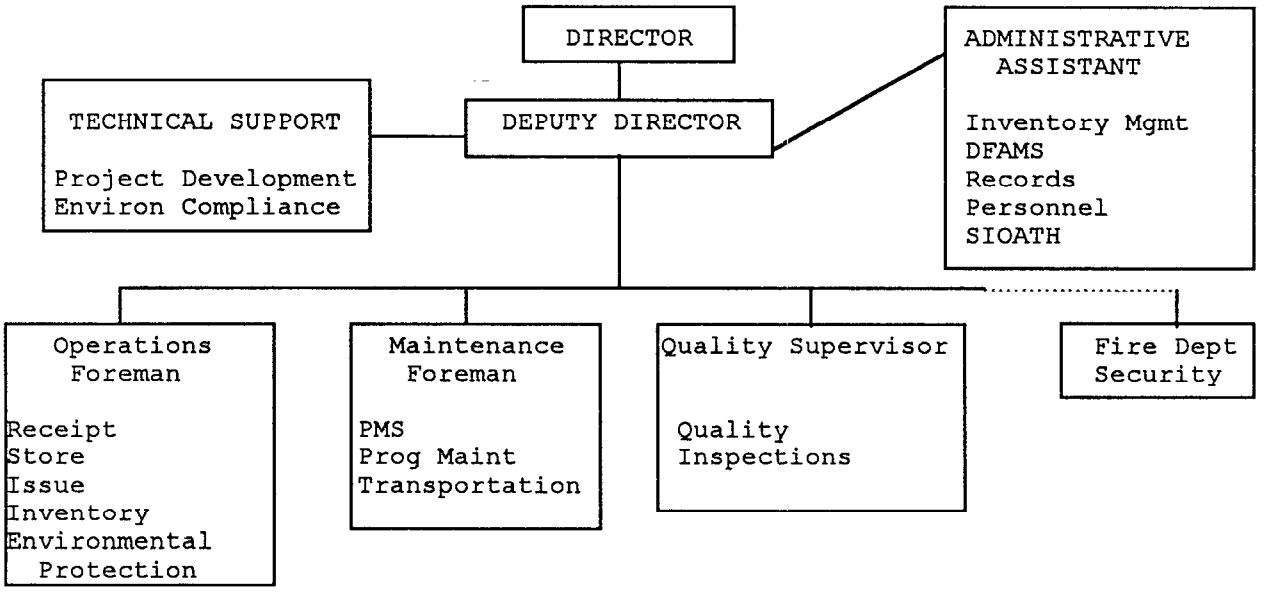
Maintenance Foreman. This position may be classified as a Foreman or General Foreman level depending on the size of the organization. The Maintenance Foreman is responsible for managing the Preventive Maintenance Program, scheduling programmed maintenance and ensuring breakdown maintenance is kept to an absolute maintenance.

Quality Surveillance Supervisor. The Quality Surveillance Supervisor reports to the Deputy Director and is responsible for managing the Quality Surveillance Program in order to maintain the quality of all petroleum products during receipt, storage and issue.

Technical Support. The technical support branch is responsible for the development and execution of maintenance, repair, and minor construction projects and managing environmental programs.

EXHIBIT 2-1

TYPICAL DEFENSE FUEL SUPPORT POINT ORGANIZATION



Administrative Assistant. This position is responsible for the review, verification and consolidation of information generated by the various fuel branches (i.e., operations, maintenance) and production of associated management reports. This person also processes receipt, storage, issue forms and documents, maintains personnel and training records, and processes the Defense Fuel Automated Management System (DFAMS) transactions.

2.3.2 Naval Air Station Personnel

Supply Officer. The Supply Officer has responsibility over all supply functions at the Naval Air Station, including the fuels function. The Supply Officer provides direction to fuel management through a Fuel Management Officer or a civilian fuel supervisor. The fuels operation may be government or contractor operated.

Fuel Management Officer: A military officer or civilian having responsibility for the direct management of the day-to-day fuel operations. The receipt, storage, and issuing of quality fuel products rests with the Fuel Officer. The Fuel Officer is also responsible for quality surveillance, facility maintenance, and the personnel training.

Fuel Supervisor: The Fuel Supervisor may be a civilian salaried series (GS), civilian wage grade (WG), or military enlisted, Aviation Boatswain's Mate, Fuel (ABF). In some cases the position may be held by a civilian contractor supervisor monitored by a Contracting Officer Representative (COR). The Fuel Supervisor is responsible for overall direct supervision of fuel operations (receiving, storing and issuing quality petroleum products).

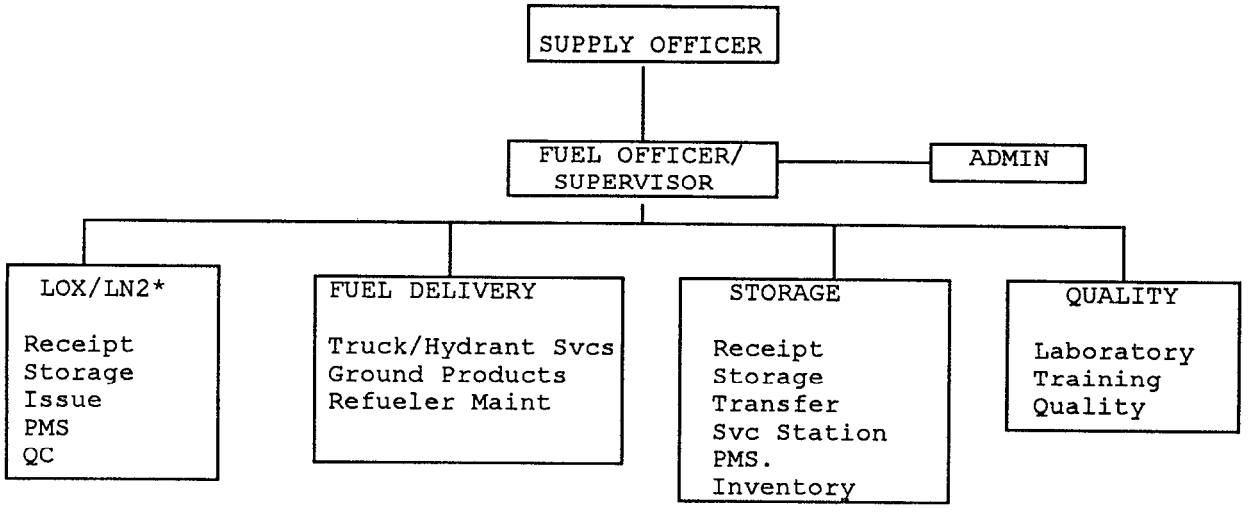
Fuel Delivery Supervisor: The Fuel Delivery Supervisor may be a military or civilian supervisor responsible for the delivery of clean, dry fuel to aircraft via refueler trucks or direct refueling systems. The individual is also responsible for the management of the Preventive Maintenance Program for all fuel delivery equipment.

Storage Supervisor: The Storage Supervisor may be a military or civilian who is responsible for all receipt, storage and transfer of fuel products. The Storage Supervisor also is responsible for all storage system preventive maintenance and the scheduling of programmed maintenance.

Fuel Inspector: The Fuel Inspector may be a military or civilian responsible for the inspection of product received, stored products and those products issued by the fuel facility to assure that it meets quality standards. This individual observes the manner in which petroleum products are handled, the quality of performance, as much as the quality of product.

EXHIBIT 2-2

TYPICAL NAVAL AIR STATION ORGANIZATION



* Fire Dept. Security and LOX LN2 personnel (liquid oxygen and liquid nitrogen) may or may not be assigned at any given facility. Since they do not deal specifically with fuel, they are not discussed in this chapter.

2.3.3 **Contractor Operated Naval Air Station Personnel**

DFSC Procuring Contracting Officer. The DFSC Contracting Officer is a warranted contracting officer that has the authority to sign contracts and obligate government resources for the purpose of carrying out the contract for services.

DFSC Administrative Contracting Specialist. The Contracting Specialist administers the contract and has the authority to change the contract, but cannot sign the contract or change order.

Navy Petroleum Office. The Navy Petroleum Office administers the Navy Alongside Aircraft Refueling Program and provides technical guidance and support to DFSC and the CORs regarding all aspects of petroleum management.

Supply Officer. The Supply Officer maintains overall control of all supply functions at the Naval Air Station, including the fuel function. The Supply Officer provides direction for the fuel management through a Contracting Officer Representative (COR).

Contracting Officer Representative (COR). The COR is the Navy's technical representation that ensures that the civilian contractor responsible for the operation of the Fuel Branch carries out all functions and duties outlined in the statement of work. The COR must be appointed in writing by DFSC.

Contractor. The contractor and the organization installed to operate the station/facility fuel function will vary by contract location. Contracts range in scope from aircraft fuel servicing only to management of the entire fuel function, from receipt and issue of product by refueler and hydrant systems.

2.4 PETROLEUM OPERATIONS MANUAL CRITERIA

A comprehensive Fuel Facility Operations Manual that conforms to 33 CFR 154 and State regulations shall be prepared and maintained by each Fuel Terminal and Air Station/Facility. The approved operations manual will be used by site personnel to ensure that all fuel-related operations are conducted in a safe and efficient manner. The operations manual must include well defined site specific operational procedures complying with all standards, directives and instructions. In general, this manual will be divided into the following sections:

o General information.

o Fuel Facility Operational Procedures and Guidelines which includes a discussion of Site Specific Standard Fuels Operating Procedures and Site Specific Standard Fuel Equipment Operating Procedures.

o Quality Surveillance Program which includes Site Specific Sampling Schedules, Site Specific Standard Laboratory Procedures, Site Specific Standard Laboratory Test Procedures, and Site Specific Calibration Program.

o Preventive Maintenance and Corrective Maintenance including: Site Specific Automated Preventive Maintenance Program Procedures for Bulk Fuel Terminals or Site Specific Automated Preventive Maintenance Program Procedures for Naval Air Stations, Corrective Maintenance Procedures, and Maintenance Management and Control System Procedures.

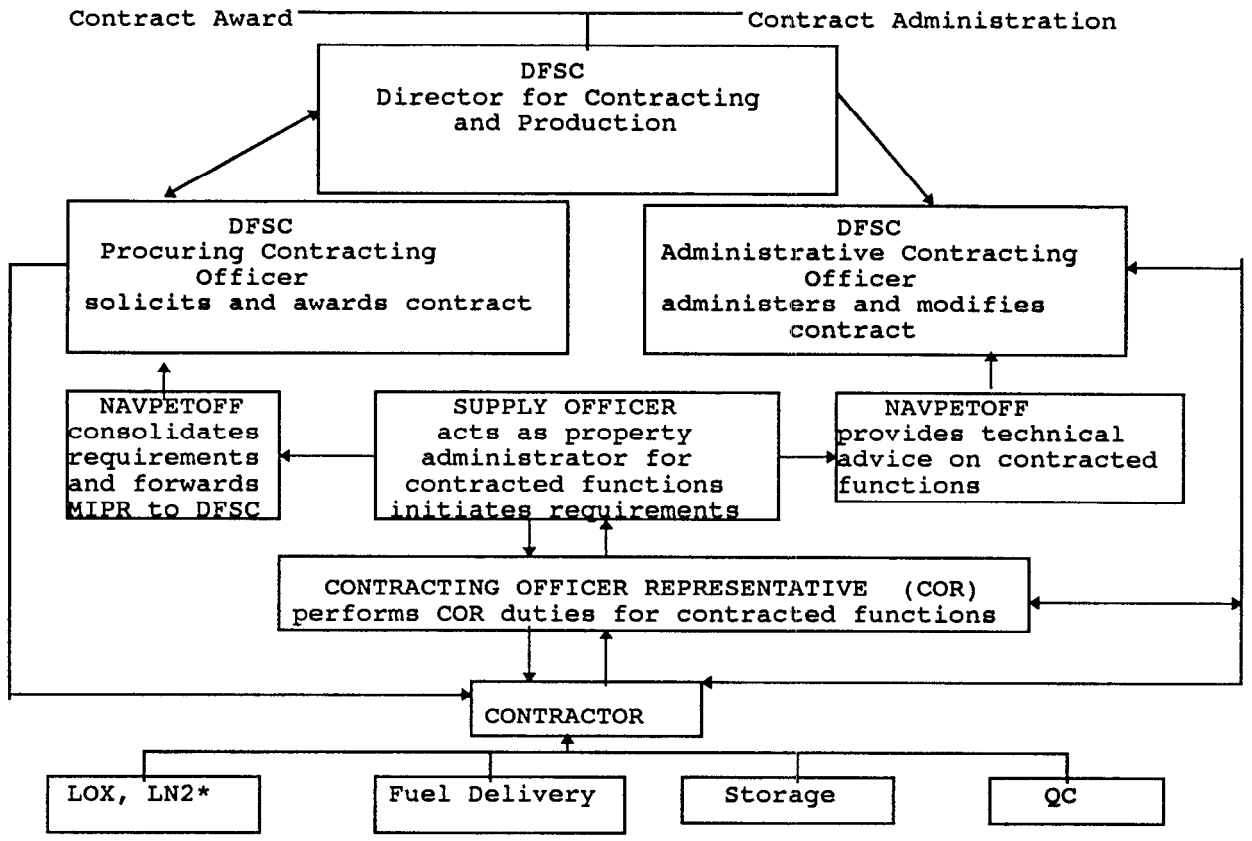
o Emergency Procedures including Site Specific Standard Emergency Response and Environmental Protection Procedures and Site Specific Standard Operating Procedures for Emergency and Environmental Protection Equipment.

o Site Specific Security, Safety, Fire Prevention, and Environmental Protection Procedures.

o Site Specific Records and Documentation Procedures.

EXHIBIT 2-3

TYPICAL CONTRACTOR OPERATED NAVAL AIR STATION



Any or all of these functions can be contracted.

* Fire Dept. Security and LOX/LN2 personnel (liquid oxygen and liquid nitrogen) may or may not be assigned at any given facility. Since they do not deal specifically with fuel, they are not discussed in this chapter.

o Site Specific Training and Certification Programs.

o Appendices.

Prior to writing an operations manual, fuel system managers must review the references cited herein and address the appropriate sections of these references in their manual. Once an operations manual has been developed, it must be reviewed and updated periodically. Reviews will be conducted annually, when major changes are issued by higher authority, or when major changes in fuel facility operations occur.

For ocean terminals, including Air Stations/Facilities that are serviced by barge, the operations manual must be reviewed by the Captain of the Port (COTP) who shall issue a "letter of adequacy" if he

used until a valid letter of adequacy has been obtained. The letter of adequacy is void if the fuel facility operator amends the operations manual or fails to amend it when required by the COTP (33 CFR 154.325).

2.4.1 **General Information**

2.4.1.1 **Manual Organization.** This section should include the promulgating instruction, the record of review, the record of changes, and a table of contents.

2.4.1.2 **Introduction.** This section of the manual should discuss the mission of the facility, its geographic location, and provide a brief history of the facility to include major construction projects, significant changes in mission, and other significant events. An organization structure and a description of the duties and responsibilities of key personnel should also be included.

2.4.1.3 **General Procedures and Guidelines.** The general section of the operations manual will also provide an overview of fuel operations and facilities. Include paragraphs required by directives, instructions, standards and 33 CFR 154.310. At a minimum, this section must address the following:

a. A physical description of the facility including:

(1) A plan of the facility showing its location, size, terrain, and all major structures such as tanks, piers and mooring areas, transfer stations, truck loading racks, control stations, pipelines, location and facilities of each personnel shelter, emergency shut down systems, spill containment equipment, and locations of safely equipment.

(2) Line and scale drawings showing the location and arrangement of all tanks, pipelines, pump stations, loading racks, piers, drainage systems, and other major structures.

(3) The maximum relief valve setting (or maximum system pressure when relief valves are not provided) for each section.

(4) The sizes, types, and number of vessels the facility can transfer fuel products to or from simultaneously.

(5) The sizes, types, and number of trucks or rail cars the facility can transfer fuel products to or from simultaneously.

(6) Quantity, type, and location of fire extinguishing equipment.

(7) Quantity, types, and locations of any monitoring devices required by the COTP because:

(a) The environmental sensitivity of the area requiring added protection.

(b) The product transferred at the facility poses a significant threat to the environment.

(c) The size or complexity of the transfer operation poses a significant potential for a discharge of oil.

(8) A description of communications systems.

(9) For each product transferred at the facility:

(a) The name of the cargo as listed in 46 CFR table 30.25-1.

(b) A description of the appearance of the cargo.

(c) A description of the odor of the cargo.

(d) The hazards involved in handling the cargo.

(e) Instructions for safe handling of the cargo.

(f) The procedures to be followed if the cargo spills or leaks, or if a persons is exposed to the cargo.

(g) A list of fire fighting procedures and extinguishing agents effective with fires involving the cargo.

b. A general description of valve, tank and pipeline alignments for various operations (specific alignments should be included in the standard operations section).

c. Physical security procedures and plans including activity access controls, traffic control, roving patrols, and other security measures.

d. Contract administration (if appropriate).

e. The hours of operation of the facility.

f. Names and telephone numbers of facility, Coast Guard, and other personnel who may be called by the employees of the facility in an emergency;

2.4.2 Fuel Facility Operational Procedures and Guidelines

2.4.2.1 **Operations Orders.** The operations manual is used primarily as a reference that describes a given operation. An operations order is a written order that describes who, what, where, when and why of a specific operations. The information to develop an operations order is derived from the information contained in the Operations Manual. The fuel terminal Operations Foreman or the Air Station Fuel Supervisor will normally be responsible for issuing operations orders. These orders can be divided into two general types: specific operations orders or those that cover long-term, multi-shift operations such as pipeline receipts, barge movements, or issues to ships, or recurring operations orders; those that cover short-term specific operations such as receipts by tank truck.

2.4.2.1.1 **Specific Operations Order.** Specific operations orders shall be issued for the following operations:

- o All receipts from or issues to waterborne craft.
- o All pipeline receipt operations.
- o All multi-car rail receipt or issue operations.
- o All inter-system transfers of product.

The responsible individual shall prepare an operations order when notified that a fuel receipt, issue or transfer operation is scheduled. The issued order then becomes the operations plan that is passed from supervisor to supervisor, shift to shift to control the flow of work and product for the given operation. As noted above, it is the written order that stipulates what product is to be moved from which tank, to what vessel, by whom, at what time, and date. At minimum, the following information shall be included in the specific operations order:

- o Date and time of the operation.
- o The numbers of the tanks to be used.
- o The berth, pipeline or railhead to be used.
- o Valve alignment for initiating and securing the operation.
- o Fuel samples, by type and location, to be taken.
- o Name of ship, if applicable, being serviced/unloaded.
- o The number and size of hoses/loading arms to be used.
- o Heavy equipment, i.e., a crane that may be required.
- o Connect telephones, if required.
- o Emergency procedures and contacts.

2.4.2.1.2 **Recurring Operations Order.** For frequent small receipts, the designation of issue tanks and fillstands/loading racks and other recurring operations, the Operations Foreman or Fuels Supervisor shall issue an operations order based on the anticipated volume and frequency. The recurring operations order will be reviewed with the shift supervisor, who in turn briefs the operators on the anticipated workload for the day. At a minimum, the following information should be included in a recurring operations order:

- o Date and time(s) of anticipated/scheduled operation.
- o Tank(s) to be put on line for receipts and issues.
- o Receipt header/manifold to be used.
- o Loading rack(s) to be used.
- o Product grade(s) to be loaded/received.
- o Samples required.
- o Emergency procedures and contacts.

An example of a typical operations order which can be used for both specific and recurring operations is provided in Appendix 6.

2.4.2.1.3 **Posting of Specific and Recurring Operations Orders.** Specific and recurring operations orders will be passed and briefed shift to shift and posted in appropriate places to ensure all personnel are knowledgeable of the operations.

2.4.2.2 **Standard Fuel Facility Procedures**

2.4.2.2.1 **Standard Fuel Facility Operating Procedures.** The Standard Operating Procedures Section of the operations manual describes in detail the sequence of events required to conduct all standard operations. This section will also detail the recurring checks required to monitor standard operations. In writing standard operating procedures, the guidance of NAVAIR 00-80T-109 and NAVFAC MO-230, coupled with site specific facility, equipment, and technical literature, must be used to describe each standard operation. This section will contain a description of each operation pertaining to storage of products and the receipt and issue of each product by truck, tanker, barge, yard oiler, pipeline, railcar and so on. Each description will include a description of the typical valve, tank, and pipeline alignments for various operations. An example of a typical standard operating procedure is provided in Appendix 3. At a minimum, the following standard operations guidance must be included in this section:

- o Receipts by tanker, barge or YO
- o Issues to tanker, barge or YO
- o Defueling from ship
- o Refueling from ship
- o Injection systems
- o Issue by pipeline
- o Receipt from tank truck
- o Receipt from tank car
- o Issue to tank truck or car
- o Vessel slop reception oil facility
- o Refueling of aircraft
- o Defueling of aircraft
- o Quality surveillance
- o Ground fuels management
- o Tank-to-tank transfers
- o Receipt by pipeline
- o Issue by pipeline
- o Tank containment, berm drainage
- o Reclamation/disposal of waste oil

2.4.2.2.2 **Standard Fuel Equipment Operating Procedures.** This section provides a detailed description of the procedures required to operate equipment, i.e., deep well turbine pumps, and facilities, i.e., the

pumphouses, used to conduct receipt, storage and issue operations. It should also include specific procedures such as gauging aboveground tanks. General guidance can be found in MIL-HDBK-200, NAVFAC MO-230 and NAVAIR 00-80T-109; however, since operating procedures, equipment and facilities are site specific, the primary references for writing this procedure will be the technical literature on the specific equipment or facility. Equipment procedures shall be posted near the equipment. At a minimum, standard procedures must be developed for:

Equipment

- o Pumps, all types
- o Valves, all types
- o Loading arms
- o Truck/rail car loading racks
- o Refuelers/Defuelers
- o Electric Motors
- o Sampling (tanks, tank trucks and rail cars, vessels

Sub-procedures

- o Water stripping
- o Line packing
- o Inspection of tanks and compartments
- o Gauging (tanks, tank trucks, rail car, vessels)
- o Use of drip and discharge collection from vessels

Since some fuel facilities my be located in environmentally sensitive areas, special monitoring devices may be required by the COTP. Instructions for operating/observing these monitoring systems during receipt, storage, and issues should be developed.

2.4.2.2.3 **Standard Fuel Operating Procedures Documentation.** The daily operation conducted at fuel facilities must be documented in a clear and complete manner. Site specific forms and logs are used to document these operations. (All events must be recorded as they occur.) A summary of these forms and logs will be included in the operations manual. At a minimum, the following site specific logs should be included:

The person performing tank gauging normally maintains entries in the log book; however, running gauges may be called in to the fuel dispatcher by radio or telephone. The shift supervisor is responsible for checking and ensuring that log book entries have been completed for his shift.

a. Stripping Log. Tank stripping logs are maintained in the fuel control office and used to record the amount of water stripped from fuel storage tanks. The following information shall be logged:

- o Date
- o Tank
- o Time (start, stop and total)
- o Water level, before/after
- o Total gallons stripped
- o Name of operator

Log book entries are made by the operator (gauger). The shift supervisor ensures log entries have been completed for his shift. A typical stripping log sample is provided in Appendix 5.

b. Pass Down Log. Pass down logs are maintained by the shift supervisor and are used to pass on pertinent information or planned action to the incoming supervisor. These logs are an invaluable source of information and should be meticulously maintained. At a minimum, the following types of information should be logged in the pass down log:

- o Any unusual event; i.e., pump failure, pipeline leak
- o Tanks, pipelines or barges used during the shift
- o Upcoming events (e.g., Texas Trader due to arrive at pier south delta 0200 7/29/93. Product to be discharged F76 75,000 bbls; JP5 35,000 bbls.)
- o Overtime authorized; i.e., personnel to handle ships lines
- o Training conducted
- o Employees calling for sick leave
- o PM performed; i.e., type of maintenance, number of personnel, specialized tasks (i.e., hot work, gas freeing, etc.)
- o Weather conditions and any related modification to operations
- o Notations regarding visitors

Pass down logs will be checked by the general foreman when coming on duty and at periodic intervals thereafter.

c. Pier Log. Pier logs are maintained to record the arrival and departure of ships, barges and actions relevant to fuel receipts and issues. Pier logs are maintained by the Fuels Wharfman. The following information should be recorded in the pier log:

- o Date
- o Time
- o Event(s)
- o Cargo lines used
  - oo Time docked/underway
  - oo Pipeline pressure
  - oo Draft on arrival/departure
  - oo Start/stop pumping
  - oo Log any unusual conditions; i.e., ship stopped, discharging disconnection due to pump overheating
  - oo Time of hose connection/disconnection

- oo Name of vessel
- oo Line samples
- oo Number and size of hoses or loading arms used
- o Operator

The shift supervisor checks and ensures log book entries have been completed for his shift. A typical pier log sample is provided in Appendix 5.

d. Pumphouse Log. Pumphouse logs are maintained as a record of pumphouse operations. They should be maintained by pump operators. The following information should be recorded on this log:

- o Date
- o Time
- o Oil levels and other operational checks
  - oo Time start/stop pumps
  - oo Pressures
  - oo Flow rates
  - oo Remarks section (log any unusual conditions; i.e., excessive pump noise, overheating, leakage, etc.)
  - oo Product pumped
- o Operator

Pumphouse logs should be kept for each pumphouse.

e. Barge Logs. Barge logs are kept to record the operation of each barge. They should be maintained by barge operators. The following information should be recorded in this log:

- o Date
- o Draft before and after operations
- o Time begin and end
- o Product transferred
- o Quality transferred
- o Remarks (log any unusual conditions; i.e., oil spill, operational delays, equipment failures, etc.)

f. Running Gauge Log. The running gauge log is used to document levels of product within a tank during receipt operation. Incremental levels (gauges) are compared with maximum fill levels to ensure a tank is not overfilled. The log also serves as a historical record of receipt operations and events applicable to any specific receipt. Appendix 5 provides an example of a typical running gauge log and the information entered during a receipt operation.

- o Date
- o Tank
- o Time of initial gauge
- o Gauge reading
- o Quantity of gauge

- o Maximum fill level
- o Operator

2.4.3 **Quality Surveillance Program**

All petroleum products have a limited shelf-life and must be closely monitored to ensure the quality of the product remains at or above specification. A stringent quality surveillance program for all petroleum products handled by each fuel facility must be developed and followed to ensure that the highest quality products are delivered to the customer. Procedures for sampling and testing of fuel stocks must be developed with the aid of MIL-HDBK-200, NAVAIR 00-80T-109 as appropriate.

2.4.3.1 **Sampling Schedules.** All fuel products shall be sampled and tested on a strict schedule to ensure that they remain within specification.

2.4.3.2 **Standard Laboratory Procedures.** This section of the manual provides a detailed description of the procedures required to operate a laboratory safely and efficiently. An inventory of all laboratory equipment should be included as an appendix. General guidance on the types of equipment required and used can be found in MIL-HDBK-200, NAVAIR 00-80T-109, FED-STD-791 and ASTM manuals; however, equipment and facilities are site specific; therefore, the primary references for writing this procedure will be the technical literature on the specific equipment or facility. At a minimum, standard procedures must be developed for:

- o Receiving of fuel samples
- o Labeling of fuel samples
- o Fuel sample test result logs
- o Test result and notification
- o Fuel sample retention program
- o Calibration program

2.4.3.3 **Standard Laboratory Test Procedures.** This section provides a detailed description of the laboratory test procedures required to ensure they are conducted safely and in accordance with ASTM standards. Standard procedures must be developed based on the requirements of MIL-HDBK-200 for terminal facilities testing at the B1 and B2 levels, and air station/facilities testing at the C level.

Different procedures will need to be developed for each type of equipment (i.e., different procedures are required for each lab station). In addition to including all standard procedures in the operations manual, specific standard procedures must be posted near the equipment addressed.

2.4.3.4 **Calibration Program.** Each fuel facility is to participate in a calibration program to ensure the accuracy of their gauging and testing equipment.

2.4.4 Preventive Maintenance and Corrective Maintenance

The efficient operation of a fuel facility requires that preventive maintenance be conducted in a timely manner to ensure that facility operations are not interrupted due to unplanned equipment failures. Additionally, preventive maintenance plays a significant role in ensuring that equipment breakdowns do not result in environmental hazards.

2.4.4.1 **Automated Preventive Maintenance Program Procedures.** This section of the manual provides a detailed description of the procedures required to use the automated Preventive Maintenance System (PMS). The key to a successful preventive maintenance program is an accurate inventory of all equipment requiring maintenance as well as the maintenance of all technical information and material provided with each piece of equipment. The Fuel Officer must ensure that any new equipment purchased and installed becomes part of the automated preventive maintenance program. For the most part, the development of the PMS program is a site specific issue that requires continuous monitoring and update of PMS records. At a minimum, PMS standards, MRCs, and EGLs must be developed for the following and equipment items.

- o Valves
- o Pumps
- o Electric motors
- o Tanks
- o Refueling/Defueling trucks
- Hoses
- Meters (calibration program)
- Pipelines
- Truck loading racks
- Direct refueling stations

An inventory of all equipment requiring preventive maintenance (EGL), schedules, and MRCs should be included in an appendix. Refer to Chapter 5 for additional information on PMS.

2.4.5 Standard Operating Procedures for Emergency Response and Environmental Protection Procedures

This section of the manual provides a detailed description of emergency procedures to respond to accidents, sabotage, fire and natural disasters. Environmental protection procedures should address oil spill prevention, waste oil disposal procedures and natural resources management. General guidance can be found in a number of publications; however, operating procedures, equipment and facilities are site specific, the primary references for writing this procedure will be the technical literature on the specific equipment or facility. At a minimum, standard procedures must be developed for:

- o System fires
- o Tank/line ruptures
- o Lightning strikes

- o Hazardous weather
- o Fuel spills
- o Industrial accidents
- o Oil spill prevention
- o Waste oil disposal

Procedures for responding to oil spills must contain a discussion of the quantity, type, location, and time limits for gaining access to containment equipment (33 CFR Section 154.320). Procedures responding to fire must contain a discussion of quantity, type, and location of fire extinguishing equipment (33 CFR Section 154.320).

2.4.6 Standard Operating Procedures For Emergency and Environmental Protection Equipment

This section of the manual provides a detailed description of the procedures required to operate emergency equipment (e.g., fire extinguisher) and facilities (e.g., foam stations) used to respond to possible threats to life, government owned and contractor owned property, and to the environment. General guidance can be found in MIL-HDBK-200, NAVFAC MO-230 and NAVAIR 00-80T-109 but because operating procedures, equipment and facilities are site specific, the primary references for writing this procedure will be the technical literature on the specific equipment or facility. At a minimum, standard procedures must be developed for:

Equipment	Sub-procedures
o All fire extinguishers	o Small spills
o Foam station	o Line packing
o Containment booms	o Inspection of tanks
o Skimmers	
o Waste oil treatment	
o Monitoring systems	

Different procedures will need to be developed for each type of equipment and facility (i.e., different procedures are required for each pump station). In addition to including all standard procedures in the operations manual, specific standard procedures must be posted near the equipment addressed. An example of a standard procedure for a pumping station is provided in Appendix 4.

2.4.7 Training and Certification Program Section

This section of the manual provides a detailed description of the training and certification required for fuel personnel to ensure that all fuel operations are conducted safely and efficiently. General guidance can be found in NAVSUPINST 12410.16 and NAVEDTRA 43288A but because operating procedures, equipment and facilities are site specific, the primary references for writing this procedure will be the technical literature on the specific equipment or facility. Therefore, standard procedures must be tailored to the facility/equipment used.

2.4.8 Records and Documentation

This section of the manual should address standard forms and logs (i.e., inventory accounting, auditing) used during fueling operations. Each form and log used will be listed with a short summary about its use. This summary must explain the purpose of the form or log, who is responsible for filling it out, how it is processed, where it is filed and how long it is retained on file. Sample logs are shown in Appendix 5.

2.4.9 Standard DOD, DLA and Navy Forms

Guidance on the development of summaries for standard DOD, DLA and Navy forms can be found in DOD 4140.25-M; NAVSUP Manual, Volume II; OPNAVINST 4100.8; and Chapter 3 of this manual. At a minimum, summaries must be developed for the following forms:

SF 1103:	Government Bill of Lading (NAVSUP P-485, Vol. II, 23011)
SF 1103a:	Government Bill of Lading (NAVSUP P-485, Vol. II, 23011)
SF 361:	Discrepancy in Shipment Report (NAVSUP P-485, Vol. II, 23065)
SF 364:	Report of Discrepancy (NAVSUP P-485, Vol. II, 23065)
DD Form 250:	Material Inspection and Receiving Report (NAVSUP, Vol. II, Chapter 3)
DD Form 250-1:	Tanker/Barge Material Inspection and Receiving Report
DD Form 1149:	Requisition and Invoice/Shipping Document (NAVSUP P-485, Vol. II)
DD Form 1348:	DoD Single Line Item Requisition System Document (NAVSUP P-485, Vol II)
DD Form 1348-1:	DoD Single Line Release/Receipt Document (NAVSUP P-485, Vol. II)
DD Form 1348-M:	DoD Single Line Release/Receipt Document (NAVSUP P-485, Vol. 2, p. 5-11)
DD Form 1155:	Order for Supplies/Services (NAVSUP P-485, Vol. 2)
DD Form 1536:	Government Bill of Lading (NAVSUP P-485, Vol. II, 23011)
DD Form 2090:	Government Property, Lost or Damaged Survey Certificate (NAVSUP P-485, Vol. II, 23011)
DD Form 200:	Report of Survey (NAVSUP P-485, Vol. II, 25155)
DD Form 2090:	GPLD Survey Certificate (NAVSUP P-485, Vol. II, 25155)
DD Form 1898:	Aviation Fuel Into-Plane Contract Sales Slip (NAVSUP P-485, Vol. II, 25155)
DLA 1886:	Source Identification and Authorization Control Record
DLA 1884:	Bulk Petroleum Terminal Message Report
DFSC 21.1:	Source Identification and Authorization Form

2.4.10 **Appendices**

The final part of the operations manual is a series of appendices that provide other information that is too detailed or voluminous to be included in the body of the operations manual. The information contained in the appendices will vary from one fuel facility to another; however, the following should be considered:

a. A list of all references, directives, manuals and instructions located in the reference library. (At a minimum, the reference library should contain copies of all the major references listed in this manual.)

b. An emergency recall bill listing all personnel assigned to the fuel facility by name, title, grade, address and telephone number.

c. Examples of forms and logs.

d. Excerpts of applicable directives.

e. Applicable Federal, State and local environmental regulations.

f. Product safety data for various fuels stored on-site.

g. A list of contact points for technical information (i.e., NAVPETOFF, NAVFAC, NAVAIR, major claimants, EFD, etc.). This list will include name, address and telephone number of organization and names of specific contacts within the organization.

h. Emergency organizations (i.e., fire department, security, duty officer, medical, etc.) and telephone numbers.

i. Mobilization information concerning the recall of Navy Reserve Units to augment the fuel facility.

j. Facility layout map.

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Chapter Three
INVENTORY MANAGEMENT

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CHAPTER THREE: INVENTORY MANAGEMENT

3.1 INTRODUCTION

The management of fuel inventories involves a full range of actions associated with orders/requisitions, receipt, transfer, issue and storage of fuel. Petroleum handling operations must be planned so that product quantities are maintained within established quantity and quality levels. The major objectives of an inventory management program at a fuel terminal are to:

- Ensure that all orders, receipts, transfers, issues, losses, gains and adjustments are properly documented.
- Maintain accountable records on all products.
- Ensure audits of fuel transactions are performed.
- Maintain control over the physical environment to ensure proper product storage can take place with minimal losses.
- Ensure that fuel losses are held to a minimum.

Inventory management procedures depend on whether fuel is owned by the Defense Logistics Agency (DLA) or the Navy. DLA-owned product is purchased at the wholesale level by the Defense Fuel Supply Center (DFSC) for direct delivery to a customer or for storage at a Defense Fuel Support Point (DFSP). DLA ownership can take place either when the fuel is procured at origin (FOB origin) or when the shipment of product is accepted at destination (FOB destination). When the Navy orders and receives fuel from a DFSP or a DFSC contract, a "sale" takes place, and the fuel becomes Navy-owned retail stock (see section 3.4).

The revolving Navy DBOF owns the petroleum classified as "retail stocks" within the Navy. These retail stocks include fleet oiler inventories, aviation fuels aboard CVs, LHAs and LPHs, and ground and heating fuels at designated shore locations/activities (see section 3.4). Funding and accounting procedures for Navy-owned products are issued by the Fleet Material Support Office (FMSO), Mechanicsburg, Pennsylvania.

3.2 REFERENCES AND DIRECTIVES

The major references that are the core of direction in the field of petroleum inventory management include:

DOD 4140.25-M	- DOD Management of Bulk Petroleum Products, Natural Gas, and Coal
NAVSUP Manual, Vol II	- Supply Procedures Ashore

OPNAVINST 4020.25	- Controlling and Accounting for Ground Fuels

These references spell out the procedures and standard practices associated with inventory management. They must be reviewed periodically to avoid disagreement and confusion whenever inventory problems or questions occur. Additional pertinent references are:

MIL-HDBK-201	- Military Standardization Handbook, Petroleum Operations
ASTM D-1085/API STD 2545	- Gauging Petroleum and Petroleum Products
ASTM D-1086/API STD 2543	- Measuring the Temperature of Petroleum and Petroleum Products
ASTM D-1250-80/IP200/ 52 (81)/API MPMS Ch 11.1	- Petroleum Measurement Tables
DOD 7200.10	- Guidelines for Reporting Lost, Damaged or Destroyed Government Property
NAVPETOFFINST 4020.1	- Bulk Petroleum and Bulk Lube Oil Requirements
NAVSUP P-485	- Afloat Supply Procedures
NAVCOMPTINST 7000.42	- Single Point of Payment of CONUS Post, Camp and Station (PC&S) Petroleum Contracts
American Petroleum Institute Bulletin 2516	- Evaporation Loss from Low-Pressure Tanks
American Petroleum Institute Bulletin 2517	- Evaporation Loss from External Floating-Roof Tanks
American Petroleum Institute Bulletin 2518	- Evaporation Loss from Fixed-Roof Tanks
American Petroleum Institute Bulletin 2519	- Evaporation Loss from Internal Floating-Roof Tanks
NAVSUP P-546	- Pilferage of Petroleum
NAVSUPINST 4020.8	- Fuel Exchange Agreements with Foreign Military Forces
OPNAVINST 4020.26	- Fuel Exchange Agreements with Foreign Military Forces

NAVCOMPT Manual Vol 3	- Appropriation Cost and Property Accounting (Field)
NAVCOMPT Manual Vol 8	- Financial Inventory Accounting, Reporting and Billing
NAVSUPINST 4440.115	- Physical Inventory Program
NAVPETOFFNOTE 4265	- Revised DOD Standard Prices and Pricing Guidance for Petroleum Products (Cognizance 9X and 1B Material)

DFSC has developed additional reference and training materials covering DFAMS functions at DFSPs and a Customer Guide for retail activities. Copies are available from DFSC-OP. These materials are:

- o The DFAMS Desk Guide
- o DFAMS Operators Training Course
- o DFSC Customer Guide for Retail Activities

3.3 DLA-OWNED PRODUCT

The Defense Logistics Agency (DLA) is the Integrated Material Manager (IMM) for bulk petroleum. Ownership of bulk petroleum inventories is defined in DOD 4140.25-M.

3.3.1 Accountability and Responsibility

The accountable officer for all DLA-owned product is the Commander, DFSC or his designee. He is responsible for maintaining accountability of all receipts, transfers, issues and operational losses or gains of petroleum products. The Commanding Officer or Officer-In-Charge of military activities storing DLA-owned product will appoint a responsible officer in writing. The duties and responsibilities of this officer are set forth in Chapter 10, Volume II of DOD 4140.25-M.

3.3.2 Issue, Receipt, Order and Requisition Documents

Like any other government property being transported and handled, petroleum products require appropriate custodial transfer and receipt documentation. Several forms comprise the most commonly used transfer documents. These include:

- o DD Form 1155, Order for Supplies and Services. This form is used to order petroleum products from DFSC contracts. (Detailed procedures for the preparation are discussed in DOD 4140.25-M, Appendix 10).

- o DD Form 250, Material Inspection and Receiving Report. This form is used to document shipments and receipts of fuel by overland transportation or pipeline. It also is used to document shipment receipts and issues to non-DOD and foreign facilities.

- o DD Form 250-1, Tanker/Barge Material Inspection and Receiving Report. This form is used to document shipments and receipts of fuel moved by tanker or barge, regardless of source. (For detailed procedures and instructions on the use, preparation and distribution of DD Form 250 and 250-1, see DOD 4140.25-M, Volume II, Chapter 5 and Appendix A28.)

- o DD Form 1149, Requisition and Invoice/Shipping Document/ DD Form 1348, DOD Single Line Item Requisition System Document/DD Form 1348-1, DOD Single Line Item Release/ Receipt Document. These forms are used to document requisitions, issues, receipts, turn-ins/returns and inventory adjustments of petroleum or contaminated products. Detailed procedures for the use, preparation and distribution of these documentation are discussed in DOD 4140.25-M, Volume II, Chapter 4.

- o Standard Form 361, Transportation Discrepancy Report. This form is used to document shipment discrepancies. It is prepared when the quantity received varies from the quantity indicated as shipped by more than the allowed tolerance. For further guidance on shipment discrepancy documentation and loss tolerances, refer to DOD 4140.25-M, Volume II, Chapter 10.

- o DD Form 1896 (White) for Jet Fuels, and DD Form 1897 (Purple) For Aviation Fuels DOD Identaplates. Identaplates are military aviation fuel cards to be used for purchases of fuels/oils when transiting facilities or installations of another Military Service or a commercial into-plane location. Information on embossing instructions can be found in DOD 4140.25-M, Volume II, Chapter 5.

3.3.3 Use of Meters for DLA-Owned Product

Meters may be used when U.S. Government written agreements or contracts with a pipeline company stipulate that the quantity determination will be based on pipeline meters, with appropriate correction for temperature or by temperature compensating meters.

3.3.3.1 **Receipts.** When temperature-compensating meters are used to determine quantities received, the quantity actually received will be determined by subtracting the beginning meter reading from the ending meter reading without temperature adjustments. A beginning temperature and gauge reading will be taken in case of meter failure during the receiving process. Temperature-

compensating meters will be calibrated according to American Society of Mechanical Engineers (ASME) and American Petroleum Institute (API) Code. When nontemperature correcting meters are used to determine the quantity received and issued, the beginning meter reading will be subtracted from the ending meter reading and the resultant quantity corrected to 60°F (see section 3.12.4).

3.3.3.2 **Issues**. When the tempo of terminal operations, size of issues and/or restrictive pipeline alignments during simultaneous operations causes tank gaugings to be impractical, local commanders are authorized to establish procedures for the use of meters to issue products. In instances where DLA-owned product issues are made to customers via an intermediary means, specifically yard craft such as YO, YON or other barges, meters are authorized for use. In order to ensure inventory accuracy, only approved and certified meters will be used and they must be calibrated semiannually in accordance with American Petroleum Institute (API) standards.

3.3.4 Monthly Physical Inventory

A complete monthly closing out inventory is required to:

a. Reconcile records with actual quantities on hand.

b. Adjust stock record account balances to reflect the actual balance on hand as a result of this inventory.

c. Identify and document gains and losses in accordance with procedures outlined in Chapter 9, Section II of DOD 4140.25-M.

A monthly physical inventory of all DLA products (fuel, additives, slop) will be taken as of 0800 the first calendar day of each month. Volume measurements and correction to 60°F (15°C) will be made using the procedures outlined in Section 3.12 (Quantity Measurement) of this chapter.

3.3.5 Accounting for Gains/Losses (Variances)

Gains or losses of petroleum products are occasionally incurred during transportation, handling, terminal operation and through evaporation. A comparison of actual versus allowable losses will be conducted monthly by the responsible officer. These losses also shall be reviewed periodically by higher commands to ensure that losses are effectively controlled and minimized. In addition, gains and losses will be charted and analyzed for trends. The three types of losses include in-transit losses, terminal or operating losses, and determinable losses. Allowable tolerances by type and product are found in Chapter 10, Volume II of DOD 4140.25-M.

3.3.5.1 **In-Transit Losses**. In-transit losses are losses of a quantity of product due to transportation, including shipment from procurement and transfers between two military facilities. It does not include transfers between tanks or different tank farms within a single fuel facility. When the loss exceeds the 0.5 percent allowance, the entire loss will be investigated and reported as required by Chapter 10, Volume II of DOD 4140.25-M. Within CONUS, in-transit losses by barge, pipeline or tanker are covered by carrier's tariffs, tenders and agreements. The applicable DFSC fuel region is responsible for investigating and reporting these losses upon receipt of copies of appropriate documentation (DD Form 250/250-1, pipeline reports, letter of investigation, etc.) from both origin and destination points. In-transit losses that occur in Government shipments will be computed immediately after receipt of product at final destination and documented on SF 361, Discrepancy in Shipment Report, except when the shipment is between DFSPs or transporting bulk petroleum products. When shipments are made FOB destination (acceptance at destination), in-transit losses are absorbed by the shipper.

3.3.5.2 Terminal or Operating Losses. Terminal or operating losses are losses of DLA-owned product due to terminal operations, including evaporation, temperature changes, minor immeasurable leaks and spills and handling losses. It does not include determinable losses, combat losses or major disasters. When the total operating loss of a specific petroleum product exceeds the specified allowance, the entire loss must be documented and reported on DD Form 200, Report of Survey, in accordance with DOD 7200.10-M and DOD 4140.25-M.

3.3.5.3 **Determinable Losses**. Quantity of product lost or destroyed from determinable causes, such as tank overflows, spills, pipeline breaks, fire, theft and unrecoverable tank bottoms is a determinable loss. Normally, these losses can be prevented or greatly minimized by effective management. These losses will be researched and reported in accordance with Chapter 2 of DOD 7200.10-M and Chapter 10 of DOD 4140.25-M. Determinable losses requiring special stock fund transactions are:

- o Combat Losses - Quantity of product lost, contaminated, or destroyed as a result of hostile actions. A combat loss may account for all or only a portion of the total quantity lost either in-transit or within the terminal. Accountability is terminated upon approval of a DD Form 1348-1 by the Commander of the organization to which the terminal is assigned.

- o Major Disasters - Quantity of product lost, damaged or destroyed by incidents such as hurricanes, flood, storms, lightning, or earthquakes. Documentation for these losses will be the same as for combat losses.

3.3.5.4 **Inventory Adjustments**. Gains/losses of DLA-owned products are documented and reported to DFSC as inventory adjustments as outlined in Chapters 9 and 10, Section II, DOD 4140.25-M. Determinable losses are documented and reported individually while terminal operating gains and losses are reported at the same time as the monthly physical inventory.

3.3.6 **Condition/Identity Changes**

Condition changes must be reported to DFSC when products do not meet specifications and are temporarily held from issue or when product is returned to specification limits (e.g., by blending or injecting additives). Identity changes occur, and must be reported to DFSC, when a product is downgraded or regraded from one specification to another grade (e.g., pipeline interfaces, fuel to slop, additives injected into fuel, reclaimed product, etc.). Documentation and reporting are outlined in Chapters 9 and 10, Section II of DOD 4140.25-M.

3.3.7 **Defense Fuels Automated Management System (DFAMS)**

DFAMS is the Automated Management Information System for DOD petroleum management to include accountability for all DLA-owned petroleum products, additives and slop. This automated system tracks all transactions through placement of an order/requisition shipment, receipt, payment to suppliers, and billing to customers by DFSC.

3.3.7.1 **Auditable Supply Transaction System**. This is operated at DFSC to receive, process and store transactions reported by HQ DFSC, DFRs and individual terminals (DFSPs). Reported transactions are accumulated on a daily basis for each product at each DFSP during a calendar month, producing a running or cumulative status of order, receipts, shipments and inventory.

3.3.7.2 **DFAMS Transaction**. Any action that affects the inventory of DLA-owned products such as orders/requisitions, shipments/issues, receipts, inventory adjustments, monthly physical inventory and condition/identity changes, is recorded in the automated system.

3.3.7.3 **Transaction Documentation**. Transactions are documented at the place where they occur on prescribed forms (DD Form 1155 series, DD Form 1149, DD Form 1348, DD Form 200, etc.). These become the source documents retained at the originating location as the auditable document copy.

3.3.7.4 **Transaction Reporting**. Navy-operated DFSPs usually report transactions to DFSC/DFAMS/DADS via commercial dial-up or Internet or two line message format, although some may report through a DFR under separate arrangements.

The information/data from source documents is converted to specified MILSPETS transaction (P-Series) reporting formats, determined by the type of transaction, and reported to DFSC either by the DFSP or through a DFR/DICP entry point. The system provides a notice to the originator (entry point) of each transaction indicating whether the transaction was accepted, rejected, suspended or if transactions are missing. A diagram showing typical transaction reporting by a DFSP to DFSC is provided in Appendix 7, Part A.

3.3.7.5 **Monthly Reconciliation**. Inventory reconciliation is accomplished monthly for each DLA-owned account (product) at each DFSP through the automated DFAMS program. The program compares the prior beginning inventory with the DFSP reported ending physical inventory, and all transactions reported for the period, to produce a new computed inventory and inventory variance. Steps in the reconciliation process are:

a. Each DFSP must prepare a physical inventory document (DD Form 1348) for each product at the DFSP and report the data to DFSC as a P41 transaction.

b. The DFSP either prepares and reports a P42 Inventory Adjustment for operating gain/loss for the product and period or the DFAMS computer program will produce the adjustment.

c. Upon receipt of the P41, and the P42 if reported, the DFAMS program attempts to reconcile the product inventory record.

d. If the computed inventory result is within the allowable tolerance, a Document Register is sent to the DFSP for validation of all entries against source documents at the DFSP and certification by the Responsible Officer.

e. The document register shows the official beginning inventory figure for the next month period.

f. A diagram outlining monthly physical inventory reconciliation responsibilities, procedures and documentation is provided in Appendix 7, part B.

3.3.7.6 **DFAMS Assistance**. In addition to DOD 4140.25-M procedures, DFSC has provided each DFSP with a DFAMS Desk Guide and Operator Training Course packages to assist personnel in DFAMS documentation, reporting and training. DFSC supplies activities with hands-on training for DFAMS.

3.4 FUEL SUPPORT

Product may be requisitioned from either a Defense Fuel Support Point (DFSP) facility or a DFSC contract. It is important to know the source of the product, because the manner

in which fuel is requisitioned or ordered depends upon the source from which the product will come.

3.4.1 Fuel from DFSC Facilities (DFSPs)/Contracts

3.4.1.1 **DFSP Support**. Defense Fuel Support Points (DFSPs) can be Navy-operated fuel terminals (GOGO), Government-owned facilities operated under contractor (GOCO) or contractor-owned and operated facilities (COCO). A Navy customer obtains fuel from a DFSP by submitting his annual bulk petroleum requirements to the Navy Petroleum Office (NAVPETOFF) per NAVPETOFFINST 4020.1 (Series). NAVPETOFF identifies specific Navy retail customers and their requirements to DFSC. This information is provided by DFSC to the applicable Defense Fuel Region (DFR) after the intended source of supply for each customer is determined (contract award).

3.4.1.2 **Notification of DFSP Support**. DFSC owns the product and controls distribution to customers by the use of the SIOATH Form, DFSC Form 21.1. SIOATHs are initiated and controlled by the Defense Fuel Regions (DFRs) and are not prepared for overseas DFSPs. For overseas DFSPs, the Joint Petroleum Office (JPO), SAPO or local command will notify an activity of terminal/ contractor support. The DFR distributes the SIOATH to both customer and supplying facility. The SIOATH document indicates who is authorized to order or requisition bulk fuel directly from a designated DFSP or a commercial contractor. Occasionally, a DFSP will refuse to issue to a Navy customer if the customer is not specifically identified on an approved SIOATH or the ordering quantity exceeds the total quantity. In this situation, NAVPETOFF, Code 20, should be immediately contacted for assistance, DSN 284-7485.

3.4.2 Fuel From DFSC Contracts

3.4.2.1 **Types of Contracts**. In certain cases, DFSC purchases bulk fuels through commercial contracts for direct delivery. There are numerous types of Post, Camp and Station (PC&S) Bulletins, bunker contract bulletins and direct delivery bulk contracts. Commercially procured bulk fuel may be inspected and accepted by a Government representative at the suppliers facility (FOB origin) or at the time of delivery (FOB destination). A diagram outlining responsibilities, procedures and documentation for a PC&S contract is provided in Appendix 8.

3.4.2.2 **Notification of Contract Fuel Support**. The second type of SIOATH that documents direct deliveries into retail tankage is issued by the DFR to the facility and authorizes the facility to place orders (DD Form 1155) with the contractor within the limits shown on the SIOATH. These SIOATHs differ from those issued for support from a terminal (DFSP) in several ways: the quantity shown is the maximum authorized by contract; the SIOATH conveys DFSC funding appropriation authority; and the DD Form 1155 executed by the activity is an obligation of government funds.

NOTE: SIOATHs are not issued for PC&S or bunker bulletins or for products ordered by the DFR. PC&S/bunker bulletins are the ordering authority and are provided directly to the activity by DFSC.

3.4.3 Ordering and Requisitioning

Orders for fuel are frequently initiated verbally. Where the source is a commercial supplier, the order must be followed by distribution of an Order for Supplies or Services (DD Form 1155) by the following work day. When the source is a Navy-operated DFSP, preparation of a Requisition and Invoice Shipping Document (DD Form 1149) may not occur until after delivery of fuel, when the precise receipt quantity is known. Under some circumstances, DFSC bills are based upon the shipment quantity -- not upon the amount of fuel received. Therefore, there may be a potential discrepancy between funds obligated (based upon a DD Form 1149 prepared at receipt) and the subsequent DFSC interfund billing (based upon DFAMS data input by the DFSP at the time of shipment). These discrepancies can be avoided by careful liaison with the supporting DFSP or DFR.

With the exception of bunkering and overseas PC&S contracts, purchases against DFSC contracts are generally paid for by DFSC and subsequently rebilled to the ordering facility at the standard price. A failure to correctly order and to properly process the ordering/receipt documents will lead to nonpayment of the supplier.

3.4.3.1 Post, Camp, and Station (PC&S) Contracts (CONUS).

NAVCOMPTINST 7000.42A provides detailed guidance on CONUS PC&S contracts. The key elements are as follows:

- All orders or amendments will be placed in accordance with terms of the contract and will be documented on a DD Form 1155.
- Orders will be distributed within one working day -- two copies to the contractor, the original plus two copies (both signed) to Defense Finance Accounting Center, Fuel Stock Fund Accounting Branch, Columbus Center, ATTN: DFAS-CO-SFP, P.O. Box 182317, Columbus, OH 43218-6252. Orders may not cover a period in excess of one calendar month.
- Receipts may be documented on either DD Form 250 or DD Form 1155 and will be distributed in three copies to the above address no later than one working day following receipt.
- All orders will cite the Defense Stock Fund accounting data and MILSTRIP data specified in NAVCOMPTINST 7000.42A. This will enable DFSC to rebill the ordering facility as indicated above.

3.4.3.2 **Bunker Contracts**. There are several Navy shore activities supported by deliveries from bunkering contract items. While ordering procedures are the same as for other commercial sources (i.e., use of the DD Form 1155) distribution of the ordering and substantiating delivery documents will be in accordance with the requirements of the contract.

3.4.3.3 **Direct Delivery Contracts**. All orders will be documented on DD Form 1155 as authorized by the SIOATH from the DFR. CONUS Navy retail activities will report and/or provide copies of the order and receipts to the DFR as arranged between the activity and the DFR. The DFR will input for activity orders and receipts into DFAMS for the customer.

3.4.3.4 **Requisitions to a DFSP**. Requisitions will be prepared for support from a DFSP on DD Form 1149 or DD Form 1348-1 per arrangements between the activity and the DFR/DFSP. Requisitions are not reported to the DFR or DFSC.

3.4.4 Use of Meters for Navy-Owned Products

Guidance on the use of meters to receive/issue product is provided in section 3.3.3.

3.4.5 Pricing

Annually on 1 October, DFSC promulgates new standard prices for all bulk fuels and lubricants. Information to Navy activities is initially provided by NAVPETOFF which distributes the pricing data by message and subsequently by NAVPETOFFNOTE 4265.

3.4.6 Issue and Receipt

Implementing correct procedures and strictly observing them is crucial to the proper inventory management of fuel. Regardless of the source of the fuel or the mode of its transportation, it is important to examine the shipping documents, the conveyance and the quality of fuel. Fuel quality is addressed in Chapter 4, Quality Surveillance. The identification of discrepancies in shipment and the proper method of accounting or reporting them are discussed in Chapter 5 of NAVSUP Manual, Volume II, and Chapters 5 and 10 of DOD 4140.25-M. Procedures and documentation on issue/receipt of DBOF fuel are provided in Appendix 9.

All receipts of bulk fuel from a DFSC contract source, except overseas PC&S, bunkers or into-plane, must be reported by the receiving activity. CONUS PC&S receipt documents are mailed (see 3.4.3.1) and direct delivery receipts are reported through the DFR (see 3.4.3.3). Generally, tank car/tank truck receipts from a DFSP are not reported to DFSC; receipts from a DFSP by

barge or pipeline may or may not have to be reported to DFSC (contact the DFSP/DFR or NAVPETOFF for instruction).

3.4.7 Inventory Management

Management of retail fuel stocks is based upon the manual procedures specified in Chapter 4 of NAVSUP Manual, Volume II. These procedures call for use of the stock record card (NAVSUP Form 766), upon which all receipts, issues and other adjustments are recorded. The precise nature of the retail activity stock management system is included in NAVSUP Manual, Volume II.

- o Losses. Monthly operating losses are computed in accordance with Chapter 5 of NAVSUP Manual, Volume II. Losses greater than the established tolerances must be surveyed. These losses (and gains) should be charted and analyzed for trends.

- o Reconciliation. NAVSUP Manual, Volume I, Chapter 4, specifies a monthly physical inventory for the purpose of reconciling stock and financial records. There is no requirement that this inventory be conducted on the last day of the month. Since financial reporting to FMSO occurs prior to the end of the month, the date for conducting fuel inventories should be set by the facility's Comptroller. This will facilitate the financial record physical inventory reconciliation and eliminate any need for an additional inventory close-out during the month.

- o Inventory Levels. The computation of Authorized Inventory Levels (AIL) is detailed in Chapter 4 of NAVSUP Manual, Volume II.

- o Annual Requirements. Annual petroleum requirements should be submitted to the NAVPETOFF in accordance with NAVPETOFFINST 4020.1A.

- o Inventory Report. To control and assess the adequacy of a fuel operation, the monthly inventory report in Appendix 10 is recommended.

3.4.8 Billing

DFSC acts as the central procurement agency for government bulk and lubricants fuel purchases and as the paying facility for suppliers. DFSC bills Navy facilities at the standard price for the purchases of fuel under the PC&S program (in CONUS), the into-plane contract bulletin program and for receipts from direct delivery bulk contracts and DFSPs. Excluded from central bill payment are purchases from the bunkering contract bulletin (CONUS and Overseas), overseas PC&S contracts and local purchases. Procedures have been incorporated within DFAMS for certain retail activities to be billed by DFSC for the quantity of fuel actually

gauged into their tanks. These procedures are applicable to commercial barge shipments and some types of pipeline deliveries. The supporting DFSP or DFR can assist in implementing receipt quantity billing for facilities that qualify.

3.4.9 Financial Inventory Reports and Manual Stock Record Reconciliation

NAVSUP Manual, Volume II contains instructions for computing monthly physical inventory adjustment (gain/loss). This adjustment is computed based upon the monthly physical inventory which is posted to stock record cards. The adjustment, if within allowable tolerances (see DOD 4140.25-M, Volume II, Chapter 10) is documented on a DD Form 1149. If outside the loss tolerances, a Report of Survey (DD Form 200) must be prepared. In addition to ensuring that stock record cards accurately reflect the inventory on hand, it is equally important to ensure that the Financial Inventory Reports (FIR) are reconciled to the Manual Stock Records (MSR). NAVSUPINST 4440.115 requires a monthly reconciliation for fuel items. This area requires particular attention since there is substantial room for error due to manual records processing. In addition, the cut-off date for financial reporting occurs well before the usual end of the month physical fuel inventory. This timing difference, plus the normal delay associated with document flow in a facility, can impede proper reconciliation. Attention to this problem is the most practical way to avoid this difficulty.

3.5 INVENTORY ADJUSTMENT DOCUMENT (IAD)

Property and accountable records at bulk fuel terminals are adjusted using DD Form 1149 (Navy-owned) or DD Form 1348-1 (DLA-owned) products, to account for all gains and losses in inventories. When the monthly terminal operating variance exceeds the established tolerance, the entire loss/gain will be investigated and documented in accordance with DOD 7200.10, Chapter 2, NAVSUP Manual, Volume II, Chapter 5 (Navy-owned product) and DOD 4140.25-M, Volume II, Chapter 10 (DLA-owned). these materials provide detailed information on how to adjust loss/gain on the stock record, the approving/disapproving authority for the adjusted item on the IAD and the requirements for preparing a report of survey.

NAVCOMPT Manual, Volume 8, Chapter 5 provides information on recording these adjustments on the Financial Inventory Report (Navy-owned product).

3.6 FUEL SURVEYS

When U.S. Government property is lost, damaged or destroyed, a survey to determine the extent of the loss or damage must be conducted. The form used to document the loss is:

- o DD Form 200, Report of Survey is used to account for losses and gains, determine the liability, provide relief from accountability where no personal responsibility is evident and for reports of survey/investigation where personal responsibility is evident and negligence can be proven. General guidance and procedures for determining the proper type of survey and documentation requirements are prescribed in DOD 4140.25-M, Volume II, Chapter 10, for DLA-owned product; and NAVSUP Manual, Volume II, Chapter 5 for Navy-owned product.

3.7 RECORDS, REPORTS AND PROCEDURES

Several documents or procedures are used to manage petroleum inventories at bulk fuel terminals. The next section describes some of these procedures and documents.

3.7.1 Slate

A slate is a monthly report of planned requirements submitted to DFSC for tanker delivery of bulk petroleum to an ocean terminal. There are two types of bulk petroleum slates, the overseas slate and the CONUS slate.

3.7.1.1 **Overseas Slate**. An overseas slate establishes delivery requirements for the current month and four subsequent months. It is transmitted by Automatic Digital Network (AUTODIN) facilities in time to arrive at the DFSC on or before the tenth calendar day of each month. It is submitted by the Joint Petroleum Office (JPO) of each Unified Command reflecting the coordinated requirements of all the Services of all ocean terminals in the area of responsibility.

3.7.1.2 **CONUS Slate**. A CONUS slate establishes delivery requirements for the current month and three subsequent months. It is submitted by Defense Fuel Regions (DFR) based on the data prepared by individual Navy activities.

For further details on Overseas and CONUS slates, refer to Chapter 4, Volume II of DOD 4140.25-M.

3.7.2 Redistribution Order (RDO)

An RDO will be used to direct and identify product movements between DFSPs and pipeline companies. An RDO is not required for the movement of product within a reporting complex, i.e., the same Department of Defense Activity Address Code (DODAAC). Further details on RDOs are covered in Chapter 4, Volume II of DOD 4140.25-M.

3.7.3 Bulk Petroleum Terminal Message Report (Report Control Symbol RCS:DLA(W) 1884, DFSC-OI)

This report provides data for DFSC inventory management and stock control/distribution of bulk fuels. The DFSP inventory data is used to answer inquiries at all levels of the Defense Department and Congress. Thus accurate, complete and timely reporting is crucial. Instructions for the preparation and submission of the 1884 reports are presented in Volume II, Chapter 10 of DOD 4140.25-M. The preferred method for receiving this report is through Defense Fuel Accounting Management System (DFAMS). Data received from activities will remain in DFAMS for two to three months.

3.8 FUEL EXCHANGE AGREEMENT (FEA)

Under an FEA, fuel will be provided to or received from a foreign government on a replacement or in kind reimbursable basis. Navy fuel facilities that receive requisitions from foreign ships and aircraft operating under an FEA will issue the requested product from DFSC-owned stocks and cite Budget Project 38 (BP38) funding. Those Navy facilities procuring fuel stocks with BP38 funds will record a receipt from procurement in cognizance symbol 9X for the value of the fuel issued to the foreign ship. The recorded amount will then be Other Supply Office (OSO) transferred to Defense Finance and Accounting Service, Defense Accounting Office, Cleveland Center (DAO-CL), Charleston, South Carolina 29408-6300 (Code BLSBC), for accountability. In accordance with NAVCOMPT 085200.2, a copy of all backup documentation will be included with the OSO Summary as submitted to DAO-CL Charleston (Code BLSBC). The interdepartmental billings from DFSC will be directed to the issuing facility. Facilities will ensure that completed copies of issue documents (DD Form 1149/1348) are forwarded to Defense Finance and Accounting Service, Defense Accounting Office-Cleveland Center (DAO-CL), (Code BLSBC), Charleston, SC 29408-6300, to enable DAO-CL to determine the chargeable country. A transaction message report must also be sent to DAO-CL, Code BLSBC, with an information copy to the appropriate Fleet Commander, NAVPETOFF, SPCC Mechanicsburg, Pennsylvania (Code 01331), and all concerned. The report should include the document number, commodity and quantity issued, name of receiving vessel and country of origin.

Countries holding bilateral and/or Fuel Exchange Agreements with the U.S. Navy are shown in Exhibit 3-1.

3.8.1 Funding

Department of the Navy (DON) receipts of foreign fuel are funded through Operation and Maintenance appropriation reimbursements to the DBOF, while foreign receipts of fuel from DON are recorded as accounts receivable in the DBOF.

EXHIBIT 3-1

COUNTRIES HOLDING BILATERAL AND/OR FUEL EXCHANGE AGREEMENTS WITH U.S. NAVY

COUNTRY	POINT OF CONTACT	FUEL
Argentina	USDAO Buenos Aires, Argentina	Special Navy Fuel (F.O.N. 70/30), Diesel Oil - Diesel Fuel, Gas Oil - Marine Diesel Oil and other types of fuel common to both the U.S. and Argentine Navies
Australia	Commander of Australian Navy	F76, JP5/AVCAT (F44)
Canada	Commander, Maritime Command Halifax or Commander, Maritime Forces, Pacific, Esquimalt	All aviation fuels (including oils and lubricants) and all Naval ship propulsion fuels normally stocked at USN/USMC and CF facilities
Chile	USDAO Santiago, Chile	NATO F76
France	Commander, Sixth Fleet	F76, JP5
Japan (MOU)	Commander, Naval Forces Japan	F76
Korea (Navy)	Commander, U.S. Naval Forces Korea	F76, JP4, JP5, JP8, MOGAS, DFM (high sulfur), Marine lubricants lubricants
Korea (Air Force)	Commander, U.S. Naval Forces Korea	JP4, JP5
Pakistan	USDAO Islamabad, Pakistan	F76, JP5
Peru	U.S. Commander, South Atlantic Forces	F76, JP5
Singapore (MOU)	Commander in Chief, U.S. Pacific Fleet (N41B)	F76, JP5
Turkey	Commander in Chief,, Turkish Navy, Ankara, TU	F76
United Kingdom (RN) (MOU)	Commander in Chief, U.S. Naval Forces, Europe	AVCAT (NATO F44), JP5, (NATO F44), Dieso Fuel (NATO F76)

3.8.2 Fuel Replacement Procedures

Issues and receipts of all products will be offset on a grade-by-grade basis to the maximum extent possible as part of the reconciliation process. Both Navies shall have the right to replace the net balance or any particular issue with fuels other than those received in consonance with relative values based on the standard prices of the Navy receiving repayment and using standard prices existing at the end of the period being reconciled. The recipient shall have the option of refusal if the fuels do not meet national requirements. When mutually convenient, repayment will be made by transferring fuel at locations where both governments have POL stocks. When repayment is to be made by tanker, unless otherwise agreed in other mutual logistics support arrangements or laws, services associated with the tanker delivery will be provided on a reciprocal no-cost basis to the greatest extent possible. Where this is not possible, these charges will be borne by the Navy making repayment.

Additional guidance regarding FEAs is described in OPNAVINST 4020.26, NAVSUPINST 4020.8 and Chapter 5, Volume II of NAVSUP Manual. Accounting procedures regarding FEAs are contained in the NAVCOMPT Manual, Volume 3, Chapter 5.

3.9 BULK PETROLEUM STORAGE FACILITIES REPORT, RCS:DD-P&L(A)506

DFSC-F will control and maintain the 506 data base which documents tankage data and receiving/shipping capability input by DOD components. The 506 data base allows DFSC to analyze storage capabilities and associated petroleum products worldwide in mission. Changes in tankage/receiving/shipping capability data shall be reported to DFSC. DFSPs (base-level/intermediate) will input data directly to the DFAMS data bank. DFSPs without direct access to the DFAMS data bank shall input data via worksheets to the DFR (JPO/SAPO for OCONUS) to access the DFAMS data bank. DFRs will provide the DFSPs with updated computer printouts. Classified data for the 506 Overseas Supplement Report will be input via classified worksheets to the appropriate JPO/SAPO. Tanks with capacities in excess of 500 barrels that are taken out of service for cleaning, repair, new construction or abandonment must also be reported to NAVPETOFF by priority message (for OCONUS activities, NAVPETOFF should be info addee on messages to JPO/SAPO concerning tanks returning or going out of service). For additional information on the interim out-of-tankage report submission, refer to Chapter 6, Part E, Section III of NAVSUP Manual, Volume II.

3.10 INVENTORY LEVELS AND REQUIREMENTS

Volume II, Chapter 11 of DOD 4140.25-M prescribes procedures and responsibilities for managing Peacetime Operating Stocks (POS) along with Bulk Petroleum War Reserve Stocks (BPWRS) at DFSPs. Resupply of DFSPs will be based on incurring stock

availability to meet operation needs, cost effectiveness of resupply and maintaining appropriate inventory levels. BPWRS shall be in addition to POS.

3.10.1 Peacetime Operating Stock (POS)

POS is the amount of fuel required to sustain peacetime operations in support of military demands to be maintained at a DFSP.

3.10.2 Bulk Petroleum War Reserve Stocks (BPWRS)

CINCs may request waivers to the policies in order to meet specific anticipated needs of an emerging contingency or an ongoing military operation.

3.10.2.1 **CONUS**. Any CONUS BPWRS must be directly supporting an Operational Plan (OPLAN). It will be limited to a stockage level for mobility requirements, strategic operations, civil defense and logistics.

3.10.2.2 **Overseas**. There shall be BPWRS to support military operations in each CINC's theater. BPWRS may not exceed the minimum levels established in common for NATO nations.

3.11 AUDIT PAPERWORK

Records of quantity measurements, calculations, receipts, issues and inventory reports must be maintained. For audit trail purposes, these records must be accurate, complete and available to justify total accountability. For DLA-owned products, source documents for all orders, receipts, issues, monthly inventories, gains and losses inventory adjustments and condition/identity changes will be retained in accordance with Chapter 1, Volume II, of DOD 4140.25-M. Inspections may be performed by the DOD-IG Inspection Team once every three years as governed by a Memorandum of Understanding (MOU) between DLA and the Navy Department.

3.12 QUANTITY MEASUREMENT

Liquid petroleum products are transported, handled and stored many times before they are used. They must be quantitatively measured to determine inventory on hand, verify quantities received, issued or transferred, detect leaks, eliminate possibility of theft and determine the presence of water. To accurately determine the quantity of liquid petroleum products, personnel must ensure packed pipelines are in proper condition, gauge fuel tanks, obtain temperatures and take water cuts. These elements, along with up-to-date calibration and correction tables, will enable fuel distribution systems personnel to accurately compute a given volume of liquid petroleum at a standard temperature of 60°F (15°C).

3.12.1 **Packing Pipelines**

A packed pipeline is the condition in which the pipelines and manifolds are kept full of product under pressure whether the lines are in operations or not. All cargo lines must be positively pressurized to the pier manifolds to ensure that pipelines are full before and after the issue or receipt of product. Check to make sure the pipeline is packed before the fuel is measured. To aid in packing pipeline systems, use of air eliminator devices should be considered.

3.12.2 **Gauging**

Gauging is the process of measuring innage or outage, bottom sediment and water (BS&W) and temperature of the tank contents. Gauging any petroleum tank or conveyance requires care and attention to avoid potential safety and environmental hazards. Specific care and safety precautions are outlined in Exhibit 3-2.

3.12.2.1 **Gauging Equipment**. The instruments and materials used in gauging liquid petroleum products are discussed below.

- o Innage Tape and Bob. The steel innage tape (MIL-T-16644) is graduated in feet, inches and to one-eighth of an inch. It is wound on hand-held reel and cranked assembly in a frame or case. The tape is equipped with a brass plumb bob. From the pointed tip of the conical bob to the first number on the tape is nine inches.

- o Outage Tape and Bob. The steel outage tape is similar to the innage tape except that the readings start at the two-inch level. The zero reference is where the harness snap connects to the bob. The rectangular bob is six-inches long. However, the one-eighth inch graduation begins with the six-inch mark at the bottom and reads upward to one inch as the last whole number on the top. The bob has a flat nose.

- o Fuel Indicating Paste. A chemical paste used in measuring the amount of liquid petroleum product in a storage tank. It will change color when it comes in contact with petroleum.

- o Water-Indicating Paste. A chemical paste used to differentiate between liquid petroleum product and water. Paste changes in color when it comes in contact with water. Petroleum products do not affect the paste.

- Hydrometers and Thermometers. These instruments are used to measure the density and temperature of fuels. This information is used to convert gross quantities of fuel to net quantities.

- Cup Case Thermometer. A standard cup-type, ASTM 59°F thermometer. It has a range of 0°F to 180°F marked on the thermometer to 1°F divisions. The thermometer is attached to a hardwood backing, with a 100-cc capacity open metal cup surrounding the thermometer bulb. When filled with liquid, the cup case minimizes fluctuation of the reading when the thermometer is suddenly withdrawn from the tank. A special trap thermometer is used for heavy fuel oil, and it may be suspended in the tank permanently.

- Petroleum Gauge Stick. A special petroleum gauge stick is used to determine the innage of a small horizontal tank, a nonpressurized tank car, or a tank truck. The reading is taken by measuring the distance from the bottom of the tank to the surface of the product. If a petroleum gauge stick is not available, a yardstick may be used to gauge the contents of a 55-gallon drum.

- Tank Car Gauge Stick. A tank car gauge stick is used to determine tank car dome innages and shell outages. The stick is 36 inches long. It has a non-ferrous metal angle attached at the zero point so the stick may rest on the tank shell at the gauging reference point of the tank car. It has two scales with a common zero, 12 inches from the lower end, graduating upward and downward. The lower figures are used to measure shell outages and the upper figures are used to measure dome innages.

EXHIBIT 3-2

TANK GAUGING PRECAUTIONS

a. Before gauging a tank, ground static electricity by touching the bare hand to the tank shell or handrail.

b. Keep the tape in contact with the rim of the gauging hatch at all times to ground static electricity.

c. Never wear clothing, such as nylon, that will generate static electricity.

d. Gauge tanks from the side of the gauging hatch facing the wind. Exercise caution against breathing vapors from the tank's contents.

e. Never gauge the tank at the approach of, or during an electrical storm.

f. Avoid walking around the floating roof of the tank. When gauging must be done from the roof, stand at the same location on the roof for both opening and closing gauges.

g. Gauge the tank to the nearest one-eighth of an inch before and after issue or receipt of product.

h. Allow products sufficient time for settling and for vapor and air expulsion. Never gauge a tank when there is evidence of air bubbles breaking at the surface of the product.

i. Repeat gauging until two identical gauge readings are obtained. Use the same gauging equipment and gauging hatches in obtaining both opening and closing gauges.

j. Wipe the tape and bob dry and clean after each use.

3.12.2.2 **Frequency of Gauging**. Liquid petroleum products must be gauged and posted periodically to ensure accurate and complete inventory records. Tanks must be gauged daily, weekly and monthly as indicated below.

- o Daily. Active tanks should be gauged before and after receipts, issues or transfers. Check gauge at least 30 minutes after receipts. For official gauge records, gauges should be performed 12 hours after completion of receipt. New tanks and tanks that have been empty for a prolonged period should be gauged at least once a day. Tanks having irregular gauging records or leakage problems should be gauged at least once a day or more often to detect leaks.

- o Weekly. Inactive tanks. All tanks, barges and tank trucks should be gauged for close out inventory on Friday.

- o Monthly. All tanks, barges and trucks should be gauged for monthly close out inventory.

3.12.2.3 **Types of Gauging**. There are basically two types of gauging, automatic and hand. These methods are described below:

- o Automatic Gauging. Automatic gauging refers to the automatic measurement of product level and temperature at the tank gauge glass or remote readout device. Approval for use of automatic gauging equipment must be obtained from NAVPETOFF. Specific requirements and certifications for this type of equipment are provided in Chapter 3 of NAVSUP Manual, Volume II.

- o Hand Gauging. Hand gauging is the physical measurement of product, BS&W, temperature and water level in tanks. It is the most common and accurate method of quantity measurement. Two methods of hand gauging are innage and outage (or ullage) gauge.

  - Innage Gauge. Innage gauge is the depth of liquid in a tank measured from the surface of the liquid to the bottom of the tank. This type of measurement is used in both aboveground and underground storage tanks. Detailed procedures for innage gauge measurement are described in Chapter 4, Section 9 of MIL-HDBK-201B; Chapter 6 of NAVEDTRA 10883B; Chapter 3 of NAVSUP Manual, Volume II; and ASTM D-1085/API 2545.

  - Outage (or Ullage) Gauge. The distance from the surface of the liquid to a reference point on the gauging hatch is known as outage, or ullage gauge. This type of measurement is used to gauging deep tanks, tankers, ships and barge compartments. To convert an outage gauge to an innage gauge, subtract the outage gauge from the reference depth of the tank. Detailed procedures for outage gauge measurement also are described in the same references for innage gauge measurement.

3.12.3 **Temperature Measurement**

The volume of liquid petroleum in a container is directly proportional to its temperature; hence, an accurate product temperature measurement must be taken at the time of gauging. The measured quantity must then be corrected to the standard temperature of 60°F (15°C).

Temperature readings are taken at specified levels in tanks. These readings are then averaged mathematically to determine the mean (average) temperature of the product. Exhibit 3-3 shows the required number of product temperature measurements and their location. For additional information on temperature measurements, refer to ASTM D-1086/API STD 2543; Chapter 4, Section 9 of MIL-STD-HDBK 201B; and NAVSUP Manual, Volume II.

Immersion time is the time it takes a thermometer to reach equilibrium in the fuel. The length of time required will be a minimum of three minutes. In fuels, Naval distillate (F76), gasoline, and jet fuels, the thermometer must remain in the product a minimum of three minutes. The readings must be taken and recorded immediately upon withdrawing the thermometer from the liquid.

3.12.4 Volume Corrections

The volumes of liquid petroleum products vary because of changes in temperature; therefore, volume corrections must be made for all receipts of petroleum products of 3,500 gallons or greater. Burner fuel and lubricating oils must be converted regardless of the quantity received.

3.12.4.1 **Tables and Strapping Charts.** All storage tanks have individual strapping charts or tank tables which provide the volume figures for a product height measurement in feet, inches and fractions of an inch. These charts/tables are prepared in barrels or gallons proportional to the volume of fuel. New certified strapping charts must be prepared after any tank repair/modification which changes the volume of the tank. The date of the tank strapping must be entered on the tank history card.

EXHIBIT 3-3

PRODUCT TEMPERATURE MEASUREMENTS

DEPTH OF FUEL IN TANK	NUMBER OF READINGS REQUIRED	WHERE READINGS ARE TAKEN
0 - 10'	1	Middle of fuel depth
10' - 15'	2	3' below surface 3' above bottom
15' - 20'	3	3' below surface, middle and 3' above bottom
20' and over	3	4' below surface, middle and 5' above bottom

3.12.4.2 **Conversion of Measured API to API Gravity at 60°F.** All corrections on fuels (Naval distillate, fuel oils, jet fuels, gasoline and other light fuels) will be made at standard temperature of 60°F (15°C) in accordance with ASTM D-150/IP 200/API-2540, Tables 5B and 6B. Table 6B, shown as Exhibit 3-4, is used to reduce observed API Gravity to API Gravity at 60°F (15°C).

3.12.4.3 **Conversion of Gross Volumes to Net Volumes at 60°F.** Further guidance on the methods of volume correction are given in Chapter 5, Section II of DOD 4140.25-M; Chapter 4, Section 9 of MIL-HDBK-201B; Chapter 6 of NAVEDTRA 10883B; Chapter 3 of NAVSUP Manual, Volume II; and ASTM D-1085/API STD 2545.

3.12.5 **Water Cuts**

Petroleum storage tanks usually contain water in the tank bottom. The volume of this water bottom is obtained by taking a water cut. This water cut is essential to determining the net quantity of product at 60°F (15°C). To obtain a water cut, the innage bob must be lowered and rest lightly on the tank bottom. Detailed procedures for taking a water cut are described in Chapter 4, Section 9 of MIL-HDBK-201B; Chapter 6 of NAVEDTRA 10883B; Chapter 3 of NAVSUP Manual, Volume II; and ASTM D-1085/ API STD 2545.

3.12.6 **Calibration of Inventory Measuring Equipment**

To assure that product quantities are accurately determined, all inventory measuring equipment must be periodically calibrated against a recognized standard and inspected to ensure that it has not been damaged or altered. Frequencies for the calibration of this equipment are provided in Exhibit 3-5. Calibration must also be performed on laboratory testing and measuring instruments (see section 4.4.3).

Exhibit 3-4
Generalized Products Volume Correction to 60°F

TEMP F	30.0	30.5	31.0	31.5	32.0	32.5	33.0	33.5	34.0	34.5	35.0	TEMP. F
45.0	1.0066	1.0067	1.0067	1.0067	1.0068	1.0068	1.0068	1.0068	1.0069	1.0069	1.0069	45.0
45.5	1.0064	1.0065	1.0065	1.0065	1.0065	1.0066	1.0066	1.0066	1.0066	1.0067	1.0067	45.5
46.0	1.0062	1.0062	1.0063	1.0063	1.0063	1.0063	1.0064	1.0064	1.0064	1.0064	1.0065	46.0
46.5	1.0060	1.0060	1.0060	1.0061	1.0061	1.0061	1.0061	1.0062	1.0062	1.0062	1.0062	46.5
47.0	1.0058	1.0058	1.0058	1.0058	1.0059	1.0059	1.0059	1.0059	1.0060	1.0060	1.0060	47.0
47.5	1.0055	1.0056	1.0056	1.0056	1.0056	1.0057	1.0057	1.0057	1.0057	1.0057	1.0058	47.5
48.0	1.0053	1.0053	1.0054	1.0054	1.0054	1.0054	1.0055	1.0055	1.0055	1.0055	1.0055	48.0
48.5	1.0051	1.0051	1.0051	1.0052	1.0052	1.0052	1.0052	1.0052	1.0053	1.0053	1.0053	48.5
49.0	1.0049	1.0049	1.0049	1.0049	1.0050	1.0050	1.0050	1.0050	1.0050	1.0051	1.0051	49.0
49.5	1.0047	1.0047	1.0047	1.0047	1.0047	1.0048	1.0048	1.0048	1.0048	1.0048	1.0048	49.5
50.0	1.0044	1.0045	1.0045	1.0045	1.0045	1.0045	1.0045	1.0046	1.0046	1.0046	1.0046	50.0
50.5	1.0042	1.0042	1.0042	1.0043	1.0043	1.0043	1.0043	1.0043	1.0044	1.0044	1.0044	50.5
51.0	1.0040	1.0040	1.0040	1.0040	1.0041	1.0041	1.0041	1.0041	1.0041	1.0041	1.0042	51.0
51.5	1.0038	1.0038	1.0038	1.0038	1.0038	1.0038	1.0039	1.0039	1.0039	1.0039	1.0039	51.5
52.0	1.0035	1.0036	1.0036	1.0036	1.0036	1.0036	1.0036	1.0037	1.0037	1.0037	1.0037	52.0
52.5	1.0033	1.0033	1.0034	1.0034	1.0034	1.0034	1.0034	1.0034	1.0034	1.0034	1.0035	52.5
53.0	1.0031	1.0031	1.0031	1.0031	1.0032	1.0032	1.0032	1.0032	1.0032	1.0032	1.0032	53.0
53.5	1.0029	1.0029	1.0029	1.0029	1.0029	1.0029	1.0030	1.0030	1.0030	1.0030	1.0030	53.5

Table 6B

Example: 175,000 barrels of diesel fuel measured at 50°F has a 31.7° API Gravity at 60°F. What is the net volume at 60°F by using this table?

Solution: Enter on the top row "API Gravity at 60°F" headed 31.5 (closed for 31.7). Read down to the observed temperature of the fuel at 50°F on the left column. The volume correction factor is 1.0045.

The net volume at 60°F in the tank is 175,000 x 1.0045 = 175,787.5 barrels or 175,790 barrels.

NOTE: This table will be shown as 5B in ASTM D-1250/IP-200/API 2540.

EXHIBIT 3-5

CALIBRATION OF INVENTORY EQUIPMENT

EQUIPMENT	STANDARD	CALIBRATION FREQUENCY
Gauging tapes	ASTM D-1085	Annually
Thermometers	ASTM D-1086 ASTM E-1 ASTM E-77	Annually
Hydrometers	ASTM E-100 ASTM E-126	Initial Calibration Only[1]
Meters	API MPMS 4, 5, 6, 11.2.1, 11.2.2, 11.2.3	Semiannually
Temperature Compensation Meters	API MPMS 5.3 MPMS 4	Semiannually

Footnote 1: No Calibration Required (NCR) after the initial calibration. ASTM Hydrometer 4H, 5H, 6H, 7H, 54H, 55H, 56H, and 57H those normally used for petroleum testing should be declared NCR after initial calibration.

Chapter Four:
QUALITY SURVEILLANCE

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CHAPTER FOUR: QUALITY SURVEILLANCE

4.1 INTRODUCTION

The facility with physical possession of government-owned petroleum products is responsible for implementing and conducting a quality surveillance program. The fuel testing laboratory is the focal point for quality surveillance. When properly implemented, a quality surveillance program will establish procedures and delineate responsibilities to maintain the quality of petroleum and related products during receipt, storage and issue.

A variety of measures are necessary to determine the quality of fuels and lubricants and to suitably maintain them for their intended use. The latest revision of MIL-HDBK-200 sets forth general instructions and the required minimum quality surveillance procedures to be followed by Navy fuel facilities worldwide. DOD Manual 4140.25-M, Volume II, Chapter 7, outlines the responsibilities of Navy laboratories in conducting quality surveillance testing on DLA-owned bulk petroleum products worldwide.

Normally, Navy Petroleum, Oil and Lubricants (POL) laboratory testing capabilities will be maintained on site. However, their capabilities can be augmented by commercial or other Service laboratories depending on the fuel activity's mission and the proximity of other POL testing laboratories.

4.2 REFERENCES AND PUBLICATIONS

The following references are applicable to quality surveillance testing. These publications must be consulted to supplement the information contained within this chapter:

MIL-HDBK-200	- Military Standardization Handbook Quality Surveillance Handbook for Fuels, Lubricants and Related Products
DOD 4140.25-M	- DOD Management of Bulk Petroleum Products, Natural Gas, and Coal
NAVAIR 00-80T-109	- Aircraft Refueling NATOPS Manual
ASTM Standards, Section 5	- Annual Book of ASTM Standards; Petroleum Products, Lubricants and Fossil Fuels (Vols. 05.01-05.05)
OPNAV Manual 43P6A	- Metrology Automated System for Uniform Recall and Reporting

Additional references include:

FED-STD-791	- Lubricant, Liquid Fuel and Related Products; Methods of Testing
NAVSUPINST 4730.1	- Overseas Laboratories for Support of Quality Surveillance of Petroleum Products
MIL-STD-45662	- Military Standard; Calibration Systems Requirements
29 CFR	- Code of Federal Regulations, Occupational Safety and Health Administration
MIL-HDBK-210	- Conversion Factors and Logistics Data for Petroleum Planning
ASTM D-4057	- Standard Practice for Manual Sampling of Petroleum and Petroleum Products
MIL-STD-290	- Packaging of Petroleum and Related Products
MIL-HDBK-113	- Guide for the Selection of Lubricants, Functional Fluids, Preservatives, and Specialty Products for Use in Ground Equipment Systems
NAVAIRINST 10300.2 NAVSEAINST 10300.1	- Fuels, Lubricants and Associated Products used by the North Atlantic Treaty Organization (NATO) and Armed Forces
MIL-STD-109	- Quality Assurance Terms and Definitions

4.3 TESTING LABORATORIES

Navy POL testing laboratories shall be equipped, maintained and staffed in accordance with the level of testing support required for the products managed by the activity and the degree of complexity of the tests performed.

4.3.1 Laboratory Classification

Because laboratories conduct a variety of tests, they are often classified by the kind of tests they can perform. Fuel testing laboratories capable of performing complete specification testing requirements along with limited investigative work are classified as

"Type A" testing laboratories. "Type B" testing laboratories conduct extensive testing but cannot perform complete specification testing. "Type C" testing laboratories can only perform basic acceptance and limited identification testing, such as visual water and solids, color and specific or API gravity.

It is not intended nor desirable for all Navy testing laboratories to be capable of conducting full specification testing on all products handled. Laboratories possessing limited testing capabilities shall forward samples requiring additional analysis to supplemental Navy, DOD or commercial laboratories. Appendix 11 provides a list of Navy FISC POL laboratories worldwide, along with their individual testing capabilities, for each of the major bulk products handled by Navy fuel facilities. MIL-HDBK-200 provides an extensive list of military Services petroleum laboratories and fuel testing capabilities.

4.3.2 Staffing

Major full scale testing laboratories ("Types A and B") should be staffed with or supervised by a chemist, preferably with a petroleum background. Day-to-day testing must be performed by personnel experienced or formally trained in petroleum testing procedures. The grade of chemists, inspectors and technicians will be consistent with the requirements, responsibilities, experience and complexity of the tasks assigned.

4.3.3 Technical Publications

Laboratories shall maintain a technical library containing current ASTM and Federal testing procedures, latest revisions of military POL quality surveillance handbooks and product specifications and recommended calibration techniques to ensure the accuracy of physical and chemical analyses performed.

4.3.4 Laboratory Responsibilities

In addition to conducting quality surveillance testing on locally stored POL products, testing laboratories shall also perform the following:

o Conduct POL testing for Navy, Marine Corps and Coast Guard activities within local geographical areas.

o Conduct quality surveillance testing on fuel samples submitted by ships and air activities.

o Test government-owned products in leased or contractor-operated terminal storage facilities.

o Perform intermittent laboratory testing services for other Services. Requests for testing from other Services which impose

extensive workloads should be referred to the Navy Petroleum Office through normal command channels for determination of reimbursement.

o Participate in correlation testing programs with industry and other government laboratories in order to standardize equipment and operator techniques.

o Manage an active calibration program for laboratory testing and measuring equipment in accordance with MIL-STD-45662 (see Exhibit 4-1 for calibration frequency, to ensure accurate equipment is being utilized for testing purposes).

o Conduct quality surveillance testing on packaged POL products in the Navy Supply System (i.e., shelf-life testing program).

o Conduct tests, as necessary, to assist operational forces reporting fuel or lubrication problems (i.e., NAVSEA used lube oil testing program).

o Upon request, provide quality surveillance training for ashore and afloat personnel.

4.3.5 Types/Frequency of Testing

Testing is normally conducted in accordance with the American Society for Testing and Materials (ASTM), Federal Test Method Standard Number 791 or other approved methods. Testing of products will coincide with the criteria of MIL-HDBK-200 (Chapter 4 and tables II through IV). Chapter 4 outlines the minimum guidelines for quality surveillance testing. Table II describes the minimum frequency for testing petroleum and related products. Table III outlines the minimum sampling and testing requirements considered necessary for determining the quality of petroleum and related products. Table IV is a series of charts providing a detailed breakdown of the type of tests required for each class of product.

4.3.6 Sampling

A sample is a representative part of a quantity of material suitable for visual or laboratory testing to show the quality, characteristics and nature of the whole quantity of that product. In general, the type, frequency, size, identification and precautions of taking samples, as well as sampling locations, are established in Chapter 5 of MIL-HDBK-200. When sampling is required, the procedures are carried out in accordance with ASTM D-4057. Table III of MIL-HDBK-200 establishes the type of samples required for a variety of product locations along with the type of tests to be performed on the samples.

4.3.6.1 **Types of Samples**. Some of the more common type samples are described below. Additional descriptions are provided in ASTM D-4057 and MIL-HDBK-200.

- o All Levels Samples. Sample obtained by submerging a closed sampler to a point as near as possible to the draw-off level, then releasing the sampler's stopper and raising the sample at such a rate that the container is 75-85 percent full as it emerges from the liquid.

- o Upper Sample. Sample obtained from the middle of the upper third of the tank contents.

- o Middle Sample. Sample obtained from the middle of the tank contents.

- o Lower Sample. Sample obtained from the middle of the lower third of the tank contents.

- o Single Tank Composite Sample. A blend of the upper, middle and lower samples of the tank contents. The portion of the sample quantity to be taken at each level varies according to the type of tank and will be specified in ASTM D-4057.

- o Bottom Sample. A sample obtained from the material on the bottom surface of the tank or container at its lowest point.

4.3.6.2 **Frequency of Sampling**. Frequency of sampling depends upon the quality and locations of the products being handled. Specific sampling frequencies are outlined in Table II of MIL-HDBK-200.

4.3.6.3 **Location of Products to be Sampled**. The specific type of sampling required for POL product testing depends upon the actual location of the product. POL products can be located in shore tanks, ship tanks, refueler trucks, depot warehouses, etc. Table III of MIL-HDBK-200 describes the variety of stock locations, types of samples required and tests to be performed.

4.3.6.4 **Size, Identification and Precautions of Sampling**. Normally, liquid samples submitted for testing shall not be less than one gallon in size while semi-solids shall not be less than five pounds. Extensive or special testing requirements can increase actual sample size. All sample containers must be labeled with a sample tag immediately after sampling. Information on the tag must include activity, name of sampler, grade of material, quantity represented, specification of product, tank number, date, type sample, contract and lot number (if applicable) and reason for sampling. Reliability of test results is based largely on the reliability of the sample itself. Accordingly, only approved type samplers, as specified in the ASTM sampling procedures, will be used. All samples and

containers must be clean, dry and free of any lint or fibrous materials. Samplers and containers must be rinsed with the product to be sampled to help prevent contamination from previous products. Sample containers will not be filled above 90 percent capacity (due to thermal expansion of sample) and must be closed tightly immediately after sampling. Additional information regarding sampling procedures is available in ASTM D-4057 and Chapter 5 of MIL-HDBK-200.

4.3.6.5 **Retention of Samples**. Appendix 12 provides guidance on sample retention. To ensure samples are not retained for excessive periods of time, inventory samples monthly and dispose of those samples for which the retention period has expired.

4.3.7 Petroleum Laboratory Safety

Most Navy POL testing laboratories conduct quality surveillance tests on flammable and combustible liquids. Because of the flammable vapors and some hazardous chemicals associated with the analysis of petroleum products, POL laboratories are classified as hazardous areas that require basic protection of human life and property. Section 8.6 reviews the guidelines for maintaining a safe laboratory. Before starting any lab work, review the precautions listed in Exhibit 8-3.

4.4 MAINTAINING EQUIPMENT AND SUPPLIES

Laboratory equipment shall be in full compliance with that specified in the applicable test method. Maintenance history records and technical manuals shall be maintained for each piece of laboratory equipment. All laboratory equipment shall be inventoried and a complete up-to-date inventory maintained.

4.4.1 Procurement of Materials

In order to minimize the financial resources necessary for equipment and supplies, facilities shall maximize their utilization of National Stock Number (NSN) material. Most materials and supplies utilized are available within the supply system at a substantial cost savings. The Identification List (IL) for the applicable Federal Supply Class (FSC) (e.g., FSC 6630, 6635, 6640; Chemical Analysis Instruments; Physical Properties and Testing Equipment and FSC 6800; Chemicals and Chemical Products) of the material being requested shall be consulted. Activities shall also cross-reference manufacturer's part numbers and NSNs by utilizing the Master Cross Reference List (MCRL-1 and MCRL-2).

4.4.2 Planned Replacement Program

An equipment replacement program shall be established for the purpose of identifying, planning, programming and budgeting for present and future equipment requirements. An effective and

aggressive replacement program will enhance overall efficiency, productivity and reliability and ensure the maximum utilization of financial and manpower resources by replacing antiquated equipment with state-of-the-art technology and equipment. Funding for equipment replacement may be achieved through the Maintenance, Repair and Environmental (MRE) Program (see Chapter 6 for additional details.)

4.4.3 Calibration Program

A formal calibration program will be established and maintained to verify and control the accuracy of testing and measuring equipment and shall fully comply with requirements set forth in MIL-STD-45662. All measuring and test equipment associated with operations, maintenance, quality surveillance, inventory control and accountability shall be included in the calibration program. The calibration program shall provide for the prevention of inaccuracy by ready detection of deficiencies and timely positive action for their correction. Calibration of testing and measuring equipment can normally be accomplished via procurement of a "master set" of the applicable equipment provided it is certifiable and traceable to an appropriate national standard (e.g., National Institute of Standards and Technology (NIST) formerly National Bureau of Standards). In addition, the Metrology Automated System for Uniform Recall and Reporting (MEASURE), part of the Metrology and Calibration (METCAL) Program, should be used where available. Exhibit 4-1 summarizes prescribed standards and time intervals for calibration of some typical laboratory equipment.

EXHIBIT 4-1

CALIBRATION OF LABORATORY EQUIPMENT

EQUIPMENT	STANDARDS	CALIBRATION FREQUENCY
Balance and Weights	ASTM E-319	24 months
Centrifuge	ASTM D-2709	6 months
Chemical Solutions	Various	As specified in Test Method
Colorimeter	ASTM D-156	Monthly
Combustible-Gas Indicator (Explosiveness Test)	FED-STD-791	Each time used
Existent Gum Apparatus:	ASTM D-381	
Well Temperature		6 months
Flowmeter		12 months
Flowmeters and Rotameters	ASTM D-3195/ASTM D-1071	12 months
Hydrometer	ASTM E-100/ASTM E-126	Initial Calibration Only[1]
JFTOT Tester:	ASTM D-3241	
Heater Tube		Each time used
Temperature Controller		
Pressure Gauge		12 months
Manometer		12 months
pH Meter	Mfgr	Each time used
Pressure Gauges	ASTM D-323	12 months
Ramsbottom Carbon Residue Apparatus:	ASTM D-524	
Furnace		6 months
Thermocouple		50 hours of use
RVP Gauges	Mfgr	Each time used
Saybolt Viscosity Flasks	ASTM D-88	12 months
Smoke Point Apparatus	ASTM D-1322	Each time used
Stirrer, Demulsification Apparatus	FTMS 791 Method 3201	6 months
Stirrer, Pensky-Martens Flask	ASTM D-93	6 months
Stop Watch	Traceable to a national standard	6 months

EXHIBIT 4-1 (CONTINUED)

Thermometers	ASTM D-1086, ASTM E-1, ASTM E-77	12 months
Thermometers, Certified	NIST	2 years
Thermometer 8F/8C	ASTM D-86	Each time used
Viscometer Tubes	ASTM D-446, ASTM D-2162	12 months
Viscosity Oil Std	NIST	6 months
WSIM	ASTM D-2550	12 months
WSIM Apparatus: Thermometer Pressure Gauge	ASTM D-2550	12 months 12 months 12 months

[1] No Calibration Required (NCR) after the initial calibration ASTM Hydrometer 4H, 5H, 6H, 7H, 54H, 56H, and 57H those normally used for petroleum testing should be declared NCR after initial calibration.

NOTE: Laboratory equipment not listed in Exhibit 4-1 but needing calibration should be included in the calibration schedule. Frequency shall be determined by published standards or manufacturer's recommendations.

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Chapter Five:
ACTIVITY MAINTENANCE

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CHAPTER FIVE: ACTIVITY MAINTENANCE

5.1 INTRODUCTION

This section establishes objectives, standards and procedures for maintenance management at Naval shore facilities involved in the receipt, storage, transfer and issue of liquid petroleum fuels and lubricants. Fuel facility maintenance can be divided into two major types: Planned Maintenance and Corrective Maintenance.

The objectives of a well-integrated maintenance program are to:

o Ensure the continued efficient operation of equipment and facilities to avoid interruption in terminal operations.

o Prevent the loss of petroleum products because of contamination, fires, spills or leaks.

o Prevent loss of life, injury to personnel or damage to property because of fires, explosion or accident.

o Protect the environment against harmful effects resulting from the discharge of petroleum products.

o Preserve the investment in equipment and facilities used in the storage and distribution of petroleum products.

5.2 REFERENCES AND DIRECTIVES

There are numerous publications to assist the manager of a fuel facility establishing or improving his maintenance program. Publications of primary importance are:

User's Guide	- Planned Maintenance System Version 3.01a
NAVFAC MO-230	- Maintenance Manual for Petroleum Fuel Facilities
NAVSUPINST 4750.1	- Planned Maintenance System for Bulk Fuel Shore Facilities

Additional references include:

NAVFAC MO-231	- Maintenance Management of Shore Facilities

NAVFAC MO-321.1	- Maintenance Management of Public Works and Public Utilities for Small Activities
MIL-HDBK-291CSH	- Cargo Tank Cleaning
MIL-HDBK-201B	- Military Standardization Handbook for Petroleum Operations
NAVFAC MO-117	- Maintenance of Fire Protection Systems
NAVFAC MO-306	- Maintenance Manual - Corrosion Prevention and Control
NAVFAC MO-307	- Corrosion Control by Cathodic Protection
MIL-HDBK-1004/10	- Electrical Engineering Cathodic Protection
MIL-STD-161	- Identification Method for Bulk Petroleum Systems
MIL-STD-457	- Frequency for Inspection and Cleaning of Petroleum Fuel Operating and Storage Tanks
MIL-STD-101	- Color Code for Pipelines and for Compressed Gas Cylinders
API RP-1110	- Recommended Practice for the Pressure Testing of Liquid Petroleum Pipelines

5.3 PLANNED MAINTENANCE SYSTEM (PMS)

PMS is a systematic approach to the planning, scheduling and managing of resources (labor, materials and time) to perform those actions that contribute to the uninterrupted functioning of the fuel terminal. PMS identifies uniform maintenance standards and prescribes procedures and management techniques to accomplish the maintenance. To reduce the cost of maintenance and increase the overall effectiveness, the maintenance actions should be divided among fuel department divisions. Each division supervisor is responsible for completing all maintenance requirements scheduled for his particular division.

5.3.1 Minimum Requirements

A well-managed maintenance program shall include, but not be limited to, the periodic inspecting, testing and repairing of all

equipment used in a fuel facility. Periodic inspection and testing are performed quarterly, monthly, weekly, daily or at a frequency determined to be the most suitable for the nature and physical condition of the equipment and for complying with safety requirements.

Publications such as NAVSUPINST 4750.1, Planned Maintenance System for Bulk Fuel Shore Facilities, the Planned Maintenance System User's Guide, and NAVFAC MO-230, Maintenance Manual for Petroleum Fuel Facilities, provide excellent guidance on PMS. Fuel maintenance personnel shall consult these three manuals when developing the preventive maintenance system most suited to their operations and physical plant.

5.3.2 Essential Tools of PMS

Several tools are required to maintain a Planned Maintenance System. These include:

o Equipment and Facilities Inventory List. A complete, valid and up-to-date inventory listing of all equipment and facilities that require periodic maintenance.

o Facility Area Breakdown Map. Because some fuel terminals cover a large area of real estate, a terminal may be divided into subareas, based on travel time, terrain or similarity of systems and equipment.

o Maintenance Requirement Card (MRC). MRCs provide detailed procedures for performing the maintenance required for a particular piece of equipment or structure, and identify the resources it takes to accomplish a specific maintenance action. They also provide safety precautions prior to and during the maintenance work. There is one card per type of equipment or structure. An MRC code is assigned to each MRC to identify each type of equipment or structure and its maintenance periodicity. See Appendix 13, part A, for an example of an MRC.

o Maintenance Index Page (MIP). MIPs are basic PMS reference documents. Each is an index listing of a complete set of MRCs applicable to a fuel terminal equipment or structure. MIPs cite equipment or structural nomenclature, control number used to identify individual type of equipment, maintenance requirements, worker skill level, maintenance frequency, estimated PMS manhours and other related maintenance that should be done at the same time. Appendix 13, part B, is an example of an MIP.

o Equipment Guide List. EGLs show a listing of equipment or structure location within a particular subarea or facility. Each EGL is used in conjunction with a controlling MRC and each contains no more than one day's work. A sample EGL is provided as Appendix 13, part C.

o Automated PMS Computer Program. This program provides an automated system that will automatically schedule planned maintenance actions, compute maintenance performance, and track equipment maintenance history record.

o Critical Code. In order to utilize limited resources efficiently so the more important maintenance actions will receive greater attention, all PMS actions are assigned a critical code. The breakdown of the codes are:

Critical Code 1: Maintenance necessary to prevent failure of essential operational or safety equipment.

Critical Code 2: Maintenance which left undone could lead to impaired or inefficient fuel operations.

Critical Code 3: Maintenance performed on non-mission essential equipment.

5.3.3 **PMS Schedule**

There are four types of maintenance schedules in a PMS program. A typical cycle schedule reflects one year of planned maintenance requirements. Any scheduled maintenance that is accomplished or unaccomplished is annotated in the automated PMS program; the program will automatically reschedule the unaccomplished maintenance action. Unscheduled maintenance activities must be recorded and documented as well.

5.3.3.1 **Monthly Schedule**. A monthly schedule shows all planned maintenance scheduled for the entire facility during the month. The automated PMS program can also produce the monthly schedule based on individual work centers. Monthly schedules are further subdivided into weekly schedules and shall be updated weekly according to work status.

5.3.3.2 **Weekly Schedule**. A weekly schedule shows all planned maintenance scheduled for a work center/division during the week. It is used by the division supervisor to assign and monitor the completion of the PMS tasks. The weekly schedules will be updated weekly to show work completed, rescheduled and not performed within the week. Overdue required maintenance shall receive the highest priority in the following week.

5.3.3.3 **Unscheduled Maintenance**. A maintenance action not in the PMS, but that is initiated instead by an operator to restore a system or equipment to proper operational condition is called unscheduled maintenance. This action shall be reported to the division supervisor as an unscheduled maintenance action and should be

documented by entering the required action in the automated PMS program and developing a new MRC or modifying an existing MRC for inclusion in the PMS.

5.3.4 PMS Action

The division supervisor should obtain the week's Weekly PMS Schedule generated from the PMS computer program and pass the schedule to the workers. The weekly schedule indicates equipment to be serviced and the types of services required by MRC codes. Each day, the responsible maintenance worker should obtain the appropriate MRC and EGL which can be generated from the PMS computer program so he can follow the maintenance procedures outlined in the MRC and know which group of equipment he will service that day. After completing the maintenance, he should return the MRC and EGL to the supervisor. The supervisor will sign off that maintenance action on the PMS computer program. If the assigned maintenance was not completed, the worker will submit a discrepancy card explaining the reasons for not completing the assignment. The supervisor should reschedule the maintenance as soon as possible. If equipment requires repair or service beyond the resources or capabilities of the worker, he should note it on the discrepancy card so the supervisor can log the requirement into the PMS computer program for tracking and initiate a service request to the Public Works Department/Center or the Department Maintenance Division.

5.3.5 Reporting

While performing planned maintenance, any discrepancies requiring corrective action will be documented on the Maintenance Discrepancy Card (see Appendix 15 for an example). Major deficiencies and upgrade requirements should also be documented and reviewed to determine the need for submission of DLA Maintenance, Repair and Environmental (MRE) projects (see Chapter 6), MILCON (see Chapter 6), or other types of projects. Identification and documentation of facility/equipment deficiencies are essential elements of a PMS program. Record of scheduled and unscheduled maintenance accomplished, problem areas, manhours spent, and estimated date of completion for any deferred maintenance item shall be retrieved from the automated PMS program and reviewed on a monthly basis.

5.3.6 Equipment and Structure Maintenance History Record

Every piece of equipment and structure should have its maintenance history record in either a computer or manual file. The record will indicate the equipment nomenclature, serial number, date of installation, date maintenance was performed, kind of service, brief description of problem, parts replaced, man-hours, cumulative manhours and next service due date. These records must be updated as soon as maintenance services have been performed. The record shall be readily available and used as a planning and estimating tool. A

sample of typical tank history records is provided in Appendix 16. The automated PMS program has the capability to track maintenance history records of service actions performed on all equipment in the PMS program.

5.3.7 Planned Maintenance System Goals

At the end of each month, a management summary report generated by the automated PMS program provides an overall percentage effectiveness of PMS accomplishment. An annual goal of 90 percent for overall effectiveness and 95 percent for priority 1 accomplishment has been established.

5.4 CORRECTIVE MAINTENANCE

Maintenance functions not covered by PMS and those that cannot be performed by the PMS crew are considered corrective maintenance. Corrective maintenance is primarily performed by the fuel department maintenance division or by Public Works support. The five major elements of corrective maintenance are described below.

5.4.1 Work Input Control (WIC)

The Work Input Control is a formalized means of managing the maintenance workload and a centralized reference for status information on all work requests. WIC begins as soon as a maintenance deficiency is identified and entered into the automated PMS program. The backlog of maintenance projects should be monitored and reviewed.

5.4.2 Priority Planning

Priorities for all work requests shall be as follows: personnel safety, mission of the facility, and improvement to operational efficiency.

5.4.3 Job Estimating

All work requests will be estimated for manhours and material and required for work completion. This information will provide a guide to assigning a balanced and adequate workload in each work division.

5.4.4 Job Scheduling

A weekly meeting is recommended to assign the following week's work to the appropriate maintenance shops.

5.4.5 Reporting

Sufficient records for all maintenance work projects, work requests submitted to PWD, and planned maintenance backlog must be

maintained to be in the overall yearly planning and budgeting cycles. The records must be retained for inspection by auditors.

5.5 STAFF CIVIL ENGINEER (SCE) ASSISTANCE

Fuel officers at facilities having a Staff Civil Engineer will work closely with the SCE to ensure fuel department requirements are identified. Procedures for documenting and submitting projects to correct deficiencies is provided in Chapter 6.

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Chapter Six:
PROJECT PLANNING AND PROGRAMMING

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CHAPTER SIX: PROJECT PLANNING AND PROGRAMMING

6.1 INTRODUCTION

For a petroleum facility to operate well, its facilities must have adequate capacity and its equipment must be in good working condition. Deficiencies must be identified early so that planning and programming can be started to upgrade facilities and replace deteriorated equipment. This will ensure the continued future use of the facility. Personnel must be familiar with the functional and administrative procedures required to ensure facility improvements are planned, programmed and executed. This chapter describes those procedures.

6.2 REFERENCES

The system established to identify facility deficiencies and to program appropriate corrective projects is defined in the following references:

DLAM 4270.1	DLA Facilities Projects Manual
OPNAVINST 11010.20	Facilities Project Manual
DOD 4140.25-M	DOD Management of Bulk Petroleum Products, Natural Gas, and Coal
NAVFACINST 11010.44	Shore Facilities Planning Manual
OPNAVINST 11010.34	Instructions for Preparation and Submission of the Annual Inspection Summary and Narrative Assessment
OPNAVINST 5090.1	Environmental and Natural Resources Program Manual

Additional references which aid in identifying deficiencies, determining required standards, developing project documentation and providing information for specific types of projects (i.e., pollution abatement projects) are:

NAVFAC Manual P-72	Facilities Category Code
NAVFAC Manual P-80	Facilities Planning Factors for Naval Shore Activities
NAVFAC Manual P-422	Economic Analysis Handbook

NAVFACINST 6240.3	Department of the Navy Pollution Control Reports; Responsibility and Guidance on Reporting of
NAVFACINST 5100.14	Navy Occupational Safety and Health (NAVOSH) Deficiency Abatement Program Ashore
NAVPETOFFINST 4100.1	Fuel Reclamation

Additional references include:

NAVFAC DM-22	Petroleum Fuel Facilities
NFC 30	Flammable and Combustible Liquids Code
NFC 45	Laboratories Using Chemicals Code
NFC 70	National Electrical Code

6.3 IDENTIFYING DEFICIENCIES

The first step in the facility planning process is to identify deficiencies. Deficiencies can be identified in several ways. Problems may be identified during regular facility inspections, when conducting routine operations and through the Shore Facilities Planning System as defined by NAVFACINST 11010.44. In addition, outside organizations may identify deficiencies during inspections.

6.3.1 Facility Inspection Program (FIP)

The FIP is the primary method used to identify facility and equipment deficiencies. This program consists of an inventory of assets, a physical annual inspection of facilities and an update of deficiency profile reports. The FIP is summarized in the Annual Inspection Summary (AIS) and the Narrative Assessment (NA). OPNAVINST 11010.34 delineates procedures and responsibilities associated with the preparation of the AIS and NA. Upon validation by the facility, the reports are forwarded to the major claimant.

The activity's Public Works Department (PWD) or area Public Works Center (PWC) is responsible for the FIP and the development of the AIS and NA. Since the AIS and NA are the primary source documents used by a major claimant to program funds to correct deficiencies, it is important that the AIS and NA accurately reflect the conditions of fuel facilities. Fuel facility deficiencies, regardless of how they are identified, must be in the AIS and NA if they are to be corrected in a timely manner. Because of the importance of these reports, the Fuel Department/Division Officer should personally review each AIS and NA to ensure that all fuel related deficiencies are included.

6.3.2 Fuel Department Identification of Deficiencies

During the routine operation and maintenance of a fuel facility, department personnel may observe facility deficiencies. There are two methods to determine the scope of these deficiencies and program corrective actions:

o A work request can be forwarded to the PWD or PWC to investigate the problem and recommend corrective action.

o Staff Civil Engineer (SCE) can be contacted to investigate the problem and program corrective action.

The method chosen by the fuel department will depend, to a large extent, on the nature of the problem and site specific working relationships with the PWD, PWC and SCE. It is essential, however, that the deficiencies included in the next update of the AIS and NA.

6.3.3 Identification by Other Organizations

Facility-related deficiencies may be identified during IG/SMA inspections or specialized periodic inspections conducted by outside organizations, such as Navy Occupation Safety and Health Inspections Program (NOSHIP), Environmental Compliance Evaluation (ECE), or annual Fire Marshal inspections. Deficiencies noted during these inspections shall be communicated to the PWD, PWC or SCE so that the scope of corrective action can be defined. These deficiencies will be included in the AIS and NA.

6.4 DEFINITIONS

Once a deficiency has been identified the next step is to define the method for correcting it. A wide range of options are available depending on the type of corrective action required. The formal use of definitions to explain the options available to correct deficiencies is intended to provide only a basic understanding of these options. Additional information pertaining to each option and funding limits is provided in the references which have been cited. The primary focal point for determining which of these options provides the best method for correcting the deficiency at a given facility is the activity's SCE, PWD or the local PWC. The following is a brief summary of available programming options.

6.4.1 Military Construction (MILCON)

A military construction project is a single undertaking at a military installation that includes all construction necessary to replace an existing facility or construct a new facility. Facilities constructed must be complete and usable, and the approved cost must be equal to or greater than the amount specified by law (currently > $300,000).

6.4.2 Minor Construction (MC)

A minor construction project is a single undertaking at a military installation that includes all construction necessary to replace an existing facility or construct a new facility. Facilities constructed must be complete and usable, and the total cost is less than the MILCON threshold specified by law (currently less than or equal to $300,000).

6.4.3 Repair

The restoration of a facility to such a condition that it can be effectively utilized for its designated purpose by overhaul, reprocessing or replacement of constituent parts or material that have deteriorated by action elements or usage and have not been corrected through maintenance. Repair projects can upgrade constituent parts of a facility to comply with current standards and regulations or to conform to modern design practices. If, however, the upgrade is required solely because of a change in mission (i.e., increase in size or capacity), the difference in cost between replacement in kind and the upgrade is considered construction.

6.4.4 Maintenance

The recurrent, daily, periodic or scheduled work required to preserve a facility by preventing its deterioration. Examples of maintenance include tank coating, painting pipelines, maintenance dredging and disposal of tank water bottoms and sediment.

6.4.5 Recurring Maintenance

Recurring maintenance is a subset of maintenance. This program is sponsored by DFSC. It is defined as maintenance performed by contract with a periodicity for the maintenance of a year or less. Examples of recurring maintenance are equipment maintenance, calibration of equipment, cathodic protection maintenance, pipeline pressure testing, fire protection maintenance, and painting. Separate recurring maintenance actions may be combined in a single project if the total cost of the actions is $100,000 per year or less.

6.4.6 Environmental Compliance

This is a DFSC sponsored program which includes minor construction, repair and maintenance projects required to bring facilities into compliance with Federal, State or local environmental laws and regulations. This program also includes the development or updating (if the period for updating is a year or greater) of documentation required by Federal, State or local environmental laws and regulations, spill clean up and related soil remediation if the spill occurred after 1 October 1992 and other environmentally related actions with period for accomplishment of a year or greater.

6.4.7 Maintenance, Repair and Environmental (MRE) Program

This is a DFSC managed program which includes minor construction, repair, maintenance, recurring maintenance and environmental compliance projects for facilities which receive, store and issue DLA owned fuel.

6.4.8 Recurring Environmental Compliance

This is a DFSC sponsored program which funds recurring environmental costs required to keep the facility in compliance with Federal, State and local environmental regulations and laws. To be eligible for this program, the facility must be used to receive, store or issue DLA owned fuel, the work must be performed by PWC or contract, and the requirement for compliance actions have a period of less than a year. Categories covered by this program include operating permits and fees, revisions of documentation, sampling and testing of emissions, removal and disposal of POL waste and spill cooperative fees.

6.4.9 DFSC Centrally Managed Programs

DFSC centrally manages several facility programs. These programs include:

o Automated Fuel Handling System (AFHS) - This program installs automated fuel operating and inventory systems at major bulk fuel terminals.

o Automated Tank Gauging (ATG) - This is an Air Force managed program administered by DFSC. It installs automated tank gauging systems at smaller fuel terminals (i.e., Air Stations).

o Underwater Surveys of Fuel Piers and Wharves - This is a NAVFAC program managed by DFSC. This program inspects under water portions of fuel piers and wharves.

o Pipeline Assessment - This is a NAVFAC program managed by DFSC. It evaluates the condition of cross country fuel pipelines (Navy owned pipelines from one activity to another).

Activities may be requested to provide information required to support these programs.

6.5 PROJECT SPONSORS

An evaluation of potential project sponsors shall be initiated while the appropriate option for correcting a deficiency is being determined. The scope of the project will be analyzed, including identification of the organization that would benefit most from the correction of the deficiency. Another factor that must be considered when determining a project sponsor is that responsibility for

correcting certain types of deficiencies has been assigned to specific organizations (for example, the clean up of hazardous waste disposal sites is the responsibility of NAVFAC).

Determining a project sponsor is important because it will affect the type of project documentation required, the method for justifying the project and how and when the project will be submitted and approved. The following is a list of potential sponsors.

6.5.1 Defense Logistic Agency (DLA)/Defense Fuel Supply Center (DFSC)

To be eligible for DLA/DFSC sponsorship, a project must be in direct support of the DLA bulk petroleum mission. The project must meet one or more of the following criteria:

- The facility must receive, store or issue DLA owned fuel.
- The project is necessary to assure compliance with Federal, State or local environmental standards.
- The project is necessary to protect DLA owned fuel from loss or contamination (i.e., fire protection systems, cleaning and lining tanks, repair pipelines, etc.).
- The project is of direct economic benefit to DLA/DFSC (i.e., tank conversion, reduction in demurrage, etc.).
- The project is directed by DLA/DFSC.
- The project is required to support DLA/DFSC minimum storage requirements.

DLA/DFSC will not fund the cost of organization maintenance performed by government or service personnel. DLA/DFSC will fund the cost of contract maintenance (Recurring Maintenance) when the work is beyond the capability of organizational labor and the work has historically been done by contract.

6.5.2 Navy Sponsorship

The Navy is responsible for sponsoring projects for the construction, repair and maintenance of facilities which receive, store or issue end use fuels (i.e., heating plant which services a single building, exchange service stations, etc.). The Navy is also responsible for sponsoring the construction and upgrade of fuel facilities if the project is in direct support of a new or expanded Navy mission.

6.5.3 Host Nation

At facilities where fueling operations are conducted in support of both U.S. and host nation Armed Forces, improvements to fueling facilities may be funded by the host nation. Criteria for the type of projects that will be sponsored by the host nation normally are addressed in the host nation support agreement. Two types of projects are usually sponsored by host nations: projects that will provide economic or operational benefit primarily to the host nation and improvements to fuel facilities for which the host nation has accepted responsibility for funding as part of the host nation support agreement or other agreements.

6.5.4 Naval Supply Systems Command (NAVSUP)

Fuel terminals designated as Defense Fuel Support Points (DFSP) with facilities to reclaim contaminated fuel can obtain funds from NAVSUP for special projects and equipment required to support these facilities. Procedures for obtaining these funds are outlined in NAVPETOFFINST 4100.1.

6.5.5 Naval Facilities Engineering Command (NAVFAC)

NAVFAC centrally manages the clean up of contaminated sites at fuel facilities if the contamination occurred prior to 1 October 1992 or the contamination is at a site which stores end use fuel using Defense Environmental Restoration Account (DERA) funds. The cognizant NAVFAC Engineering Field Division is responsible for coordinating clean ups using DERA funds. It should be noted that DLA requires the Navy to provide "clean sites" for the construction of DLA sponsored MILCON projects. This means that if the site is contaminated, it is the responsibility of the Navy to fund the clean up of the site

The planning, programming, and procurement of oil spill equipment is the responsibility of the Naval Facilities Engineering Support Service.

6.6 DEVELOPMENT OF PROJECT DOCUMENTATION

After a deficiency has been defined and the appropriate sponsor has been determined, the next step in the process of correcting the deficiency is the development of project documentation. It is critical that this documentation be complete, correct and well written because, if it is not, valuable time can be wasted correcting it. Areas of major concern are:

o The type of documentation used is consistent with the criteria for project documentation defined by the program sponsor.

o The deficiency to be corrected must be fully defined including its impact on fueling operations. If the deficiency is in violation

of health, safety, environmental or operational standards, the standards must be clearly and completely referenced and a short summary of its content provided.

o The cost estimate must be detailed, complete and accurate.

o The scope of corrective action must provide a solution to the problem which fully corrects the deficiency. It is cost effective and it is consistent with current design standards.

6.6.1 DLA Military Construction (MILCON)

Documentation required to support DLA MILCON projects should be developed using guidance defined in the most current addition of DLAM 4270.1. At a minimum documentation must include:

o DD Form 1390, Military Construction Program for each activity.

o DD Form 1391, Military Construction Project Data.

o Facility Study.

o Economic Analysis. The economic analysis must either justify the project solely on the basis of economics (Type I or primary analysis) or demonstrate the lowest cost alternative in order to fulfill operational requirements (Type II or secondary analysis).

o Scope and Detailed Cost Estimate. The scope and cost estimate must be verified by cognizant NAVFAC Engineering Field Division, local PWC or activity PWD.

o For overseas activities a statement of proponent's attempt to secure host nation support for the project, clearly demonstrating that such support is unavailable, impractical, infeasible or uneconomical.

o An assessment of potential environmental impact.

o Site approval verified by the cognizant NAVFAC Engineering Field Division.

o Other supporting documentation (i.e., photographs, notices of violation, etc.).

6.6.2 DFSC Maintenance, Repair and Environmental (MRE) Projects

Documentation required to support DFSC MRE projects should be developed using guidance defined in the most current addition of DLAM 4270.1. At a minimum documentation must include:

o DD Form 1391, Military Construction Data.

o Detailed cost estimate including SIOH and design costs. The cost estimate must be verified by cognizant NAVFAC Engineering Field Division, local PWC or activity PWD. Verification must be noted on the project documentation. If the project involves two or more types of work (i.e., construction and repairs), the cost for each type of work should be noted on appropriate lines in the cost estimate (C for construction, R for repairs and M for maintenance).

o Brief Facility Study (one or two pages addressing questions outlined in DLAM 4270.1, Appendix E).

o Other supporting documentation (i.e., photographs, notices of violation, etc.).

Sample documentation for MRE projects is provided in Appendix 14.

6.6.3 Recurring Environmental Cost Program

Documentation required to support the DFSC sponsored Recurring Environmental Cost Program is defined in Chapter 10.

6.6.4 Navy Sponsored Projects

The development and formats for Navy fuel projects is exactly the same as other Navy projects. Guidance for the preparation of documentation for minor construction, repair and maintenance projects is provided in OPNAVINST 11010.20. Procedures for the development of MILCON project documentation can be found in NAVFACINST 11010.44. Environmental projects should be documented using guidance provided in NAVFACINST 6240.3.

6.6.5 NAVSUP Reclamation Projects

The annual fuel reclamation budget should include projects required to support the reclamation mission. Projects should be listed in priority order with a narrative justification for each project. Step II documentation is required for repair and maintenance projects costing more than $200,000 and minor construction projects costing more than $100,000. Guidance required to develop Step II documentation is provided in OPNAVINST 11010.20.

6.6.6 NAVFAC Sponsored Projects

NAVFAC is responsible for funding projects/studies related to the installation restoration program. These responsibilities include preliminary assessments, site inspection, feasibility study and remediation design and action. General guidance for this program can be found in OPNAVINST 5090.1. More information on this program and assistance in implementing it can be obtained from the cognizant NAVFAC Engineering Field Division

6.7 SUBMITTAL OF PROJECT DOCUMENTATION

The timely submittal of project documentation is critical to ensure that the deficiencies are corrected expeditiously. Late submittals hinder the review process and, in some cases, may result in the rejection or deferral of a project. To ensure that project documentation is submitted in a timely manner, activities must be aware of program submittal dates and must tailor their program for the development of project documentation so that documentation has been developed and reviewed in advance of submittal dates (this should be a year-round effort).

6.7.1 DLA Military Construction (MILCON)

The following is a summary of the DLA MILCON submittal process:

o October - DFSC sends out a data call for MILCON submissions for a five year fiscal year period beginning five years from the fiscal year in which the data call occurs (i.e., the data for October 1994 is for fiscal years 1999 through 2003). Submissions for outyears (after the program year) may consist of preliminary documentation. NAVPETOFF, acting as the Navy Service Control Point (SCP), will forward this data call to Navy major claimants with copies to activities with DLA owned fuel.

o February - Navy major claimants forward candidate MILCON project documentation received by their activities to NAVPETOFF. This submittal should include a project priority list (major claimants having overseas activities should forward a copy of project documentation for these activities to appropriate CINC-JPOs). NAVPETOFF will review and validate project documentation and develop a Navy project priority list. A copy of the project priority list will be forwarded to Navy major claimants and CINC-JPOs for validation.

o March - NAVPETOFF forwards MILCON documentation and validated Navy priority list to DFSC.

o March to May - DFSC reviews and validates Service MILCON projects and develops integrated priority project list.

o May - DFSC develops a MILCON slate and forwards copies of SCPs and CINC-JPOs.

o July - The DFSC IPRB meets to review, endorse and prioritize projects for submittal to DLA. Major claimants will be invited to present their projects.

o August to April - DLA will review, endorse or reject DFSC submitted projects.

A milestone chart for this submittal process is provided as Exhibit 6-1.

6.7.2 DFSC MRE Projects

The following is a summary of the DFSC MRE submittal process:

o October - DFSC sends out a data call for MRE submission for a two year fiscal year period beginning the next fiscal year. Complete documentation is required for the first year and a list of projects is required for the second year. NAVPETOFF will forward this data call to Navy major claimants with copies to activities with DLA owned fuel.

o January - Navy major claimants forward candidate project documentation received by their activities to NAVPETOFF. This submittal should include a project priority list (major claimants having overseas activities should forward a copy of project documentation for these activities to appropriate CINC-JPOs). NAVPETOFF will review and validate project documentation and develop a Navy project priority list and a major claimant priority list. A copy of the major claimant project priority list will be forwarded to Navy major claimants and CINC-JPOs for validation.

o February - NAVPETOFF forwards documentation and validated Navy and major claimant priority lists to DFSC.

o February to April - DFSC reviews, validates and budgets for Service projects.

o May - DFSC provides a list of approved projects, approved with comment and not approved projects to NAVPETOFF. NAVPETOFF forwards this information to major claimants. It is important to note that, just because a project is not approved by DFSC, does not mean that the project will not be funded by DFSC. In most cases the project is not approved because the cost estimate was incomplete, the impact of the deficiencies on the DLA fuel mission was not adequately explained, or the scope of the project did not fully define how it will correct the deficiencies. If this information is provided, the project may be approved by DFSC.

o May - Activities may request design funds for approved projects from DFSC.

o October - Activities may request construction funds from DFSC.

A milestone chart for this submittal process is provided as Exhibit 6-2.

EXHIBIT 6-1

MILCON PROGRAM CYCLE

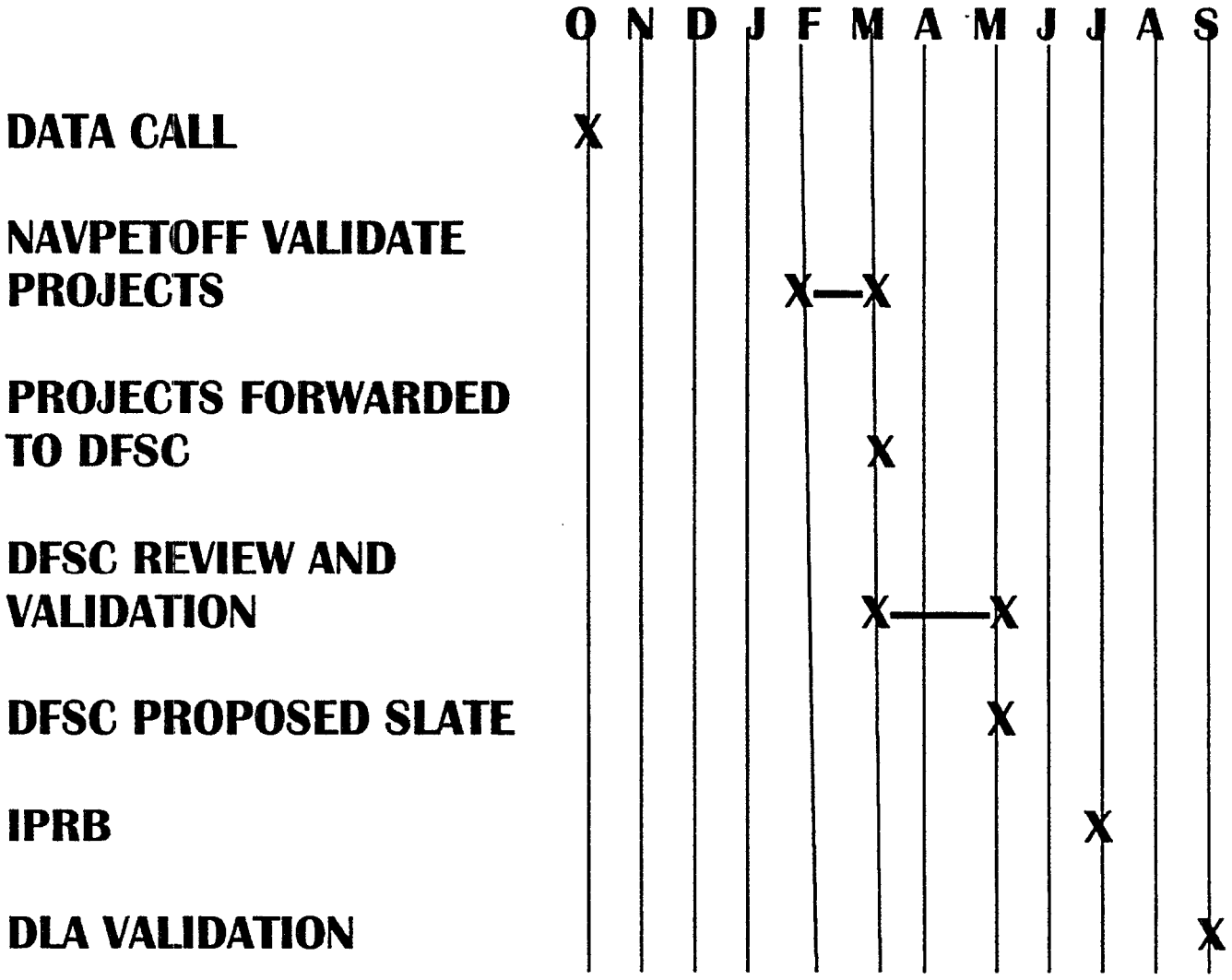
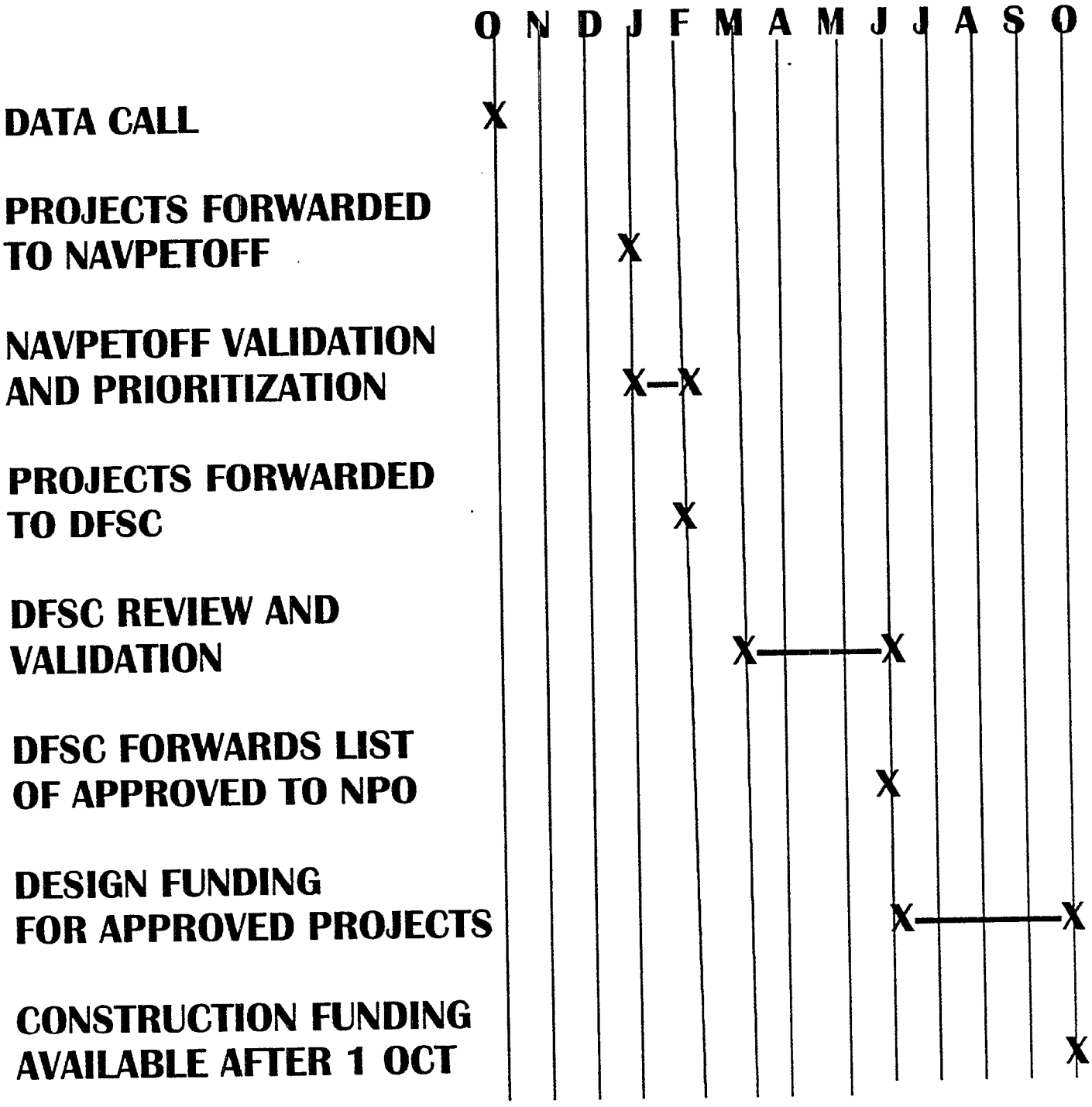


EXHIBIT 6-2

ANNUAL MRE PROGRAM CYCLE



6.7.3 DFSC Recurring Environmental Cost Program

Documentation for this program will be requested as part of the MRE data call. Procedures for the submittal of DFSC Recurring Environmental Cost information is provided in Chapter 10.

6.7.4 Submittal of Emergent Projects

If a problem should arise which has an immediate impact on the ability of an activity to perform its DLA fuel mission and, because of the critical nature of the problem, it must be corrected prior to the next programmed data call, the activity may request emergent funding to correct the problem. Due to the serious nature of this type of deficiency, a message is usually used to request funds. This message should be sent directly to DFSC with a copy to the activity's major claimant and NAVPETOFF. The message must define the nature of the problem, its impact if not immediately corrected, the scope of corrective action, the cost of corrective action, and an address where funds should be forwarded. Normally this message is followed up with a complete DD Form 1391.

This same procedure should be used when requesting funds to contain, clean up and restoration of an oil spill of DLA owned product.

6.7.5 Navy Sponsored Projects

Navy projects should be submitted via the chain of command and at times defined by the program sponsor and appropriate Navy instructions.

6.7.6 NAVSUP Reclamation Program

Fuel reclamation projects should be submitted to NAVPETOFF in May of each year as part of the activity's reclamation budget.

6.7.7 NAVFAC Programs

Requirements for oil spill equipment should be documented as part of the Annual Allowance Requirements Review. Procedures for submitting requirements is defined in NEESA 7.01G.

6.8 FUNDING SUPPORT

Requests for funds to execute programs must contain all the information required by the program sponsor. To ensure the timely funding of corrective actions, funding should be requested by the date specified by the program sponsor.

6.8.1 DLA Military Construction

DLA will forward design funds to the design agent (normally this is the cognizant NAVFAC Engineering Field Division) two years prior to the year of execution. Construction funds will be provided prior to construction bid opening (this is normally the January time frame of the year of execution).

6.8.2 DFSC Maintenance, Repair and Environmental

Funding requests may be made by letter or message. The request should include:

o A subject line which includes the project title and the DFSC assigned project number.

o Amount of funds required and the proposed use of the funds (i.e., design, construction, study, etc.).

o Type of funding cited on DD Form 448, Military Interdepartmental Purchase Request (Direct Cite or Reimbursable).

o Specific organization, address and contact point where funding documentation should be forwarded. The organization specified should receive all funds for a given project.

o Any additional information (i.e., date funds are required, internal contract number to be referenced, request that copies of funding documentation be forwarded to other organizations, etc.).

A signed acceptance copy of the DD Form 448 must be returned to DFSC.

6.8.3 Recurring Environmental Compliance

Procedures for obtaining funds to support this program are provided in Chapter 10.

6.8.4 NAVSUP Reclamation Program

Fund requests for approved reclamation projects should be made by letter. The request should normally be made in the quarter the funds are programmed.

6.9 RESPONSIBILITIES OF FUEL OFFICERS AND SUPPLY DEPARTMENT OFFICER

It is the duty of the responsible officer to ensure that all fuel facilities are able to perform their mission in an efficient and economical manner. Any deficiencies that hinder the ability of the facility to perform the assigned function must be corrected expeditiously. To identify and correct deficiencies, the responsible

officer must have a close working relationship with the activity PWD/PWC and SCE. As part of this relationship, the responsible officer should:

o Be closely and actively involved in all surveys and inspections of fuel facilities.

o Establish long-range plans for engineering inspections of major tanks, distribution systems, facilities and equipment.

o Request special surveys (i.e., corrosion control survey, technical assistance visit, etc.).

o Assist the PWD/PWC or SCE in defining the scope and sponsorship of actions necessary to correct deficiencies.

o Develop a prioritized list of projects and work requests in conjunction with PWD/PWC and SCE.

o Conduct regular meetings with PWD/PWC and SCE to review the status of projects and work requests.

o Review, and when appropriate, develop project documentation.

o Ensure project documentation is submitted in a timely manner.

o Ensure that questions on project documentation are answered and projects funds are requested as soon as projects are approved.

o Review and comment on all project designs and specifications.

o Assist construction inspectors during construction, repair or modification of facilities to ensure that the completed project will meet the requirements of the fuel department.

o Establish a file for each project or work request. At a minimum, this file should include project documentation and all related correspondence.

Only with continuous involvement by the responsible officer can there be assurance that actions required to correct facility-related deficiencies will be planned, programmed and constructed in an adequate manner.

Chapter Seven:
TRAINING

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CHAPTER SEVEN: TRAINING

7.1 INTRODUCTION

The success of a fuel facility operation is directly dependent on an adequately trained work force. Proper training gives employees the knowledge to correctly complete assigned duties and the confidence to act decisively in case of an emergency. Although a new employee receives much training before starting work (see section 7.3), completing the orientation program is just part of an ongoing process. Every employee's training continues in monthly safety meetings, fire and spill control drills and special hazard sessions (see section 7.5) The minimum training programs required to ensure the successful operation of a fuel terminal or air station are described in this chapter.

7.2 NEW EMPLOYEE INDOCTRINATION

It is essential that an orientation program for all new employees, including military personnel, be developed. This program should include:

a. A list of all instructions, manuals and guidance employees are required to read and understand. At a minimum, this list should include an operations manual; instructions for safety, security, and fire protection; and administrative guidance for scheduling matters like leave and overtime.

b. A familiarization tour of the facility. The tour should be conducted by the immediate supervisor and include the fire department, security office, fuel pier, pumping stations, fuel tanks, maintenance shops, medical facilities, administrative office, pipeline locations, water treatment facility, fuel laboratory and truck loading racks. For air stations, the tour should include flight lines, the crash crew facility, transportation shop and main supply office.

c. An explanation to all new employees, before starting work, about the location of fire alarm stations, speed limits on the fuel facility, parking areas for private vehicles, reporting accidents to the supervisor, security of the fuel facility, authorized smoking areas, and procedures for assigning a new employee to a work center to work with qualified personnel until successfully completing the personnel qualification standard for a work center and grade. As part of the explanation, the employee should be given a card with emergency phone numbers for fire department, security office, fuel control center and medical facility. NOTE: Before performing any work, new employees must be thoroughly indoctrinated in the formal safety program.

When a new employee is first hired, he should attend the general safety training conducted by the command. He will be issued pamphlets on safety and briefed on general safety rules. New fuel facility employees also will be issued a Fuel Terminal Operations Manual. This manual, along with the fuel department/division briefings and safety pamphlets, comprise some of the most important training the employee will receive.

The Fuel Terminal Operations Manual will familiarize officers and employees with the fuel terminal, correct procedures for fuel handling and reference publications that cover fuels, lubricants and safety.

The new employee should read these documents before the safety orientation and note any areas that remain unclear. The formal safety orientation will be conducted by senior personnel within the fuel facility who are fully qualified by virtue of their experience or training.

7.3 COMPETENCY BASED CERTIFICATION FOR EMPLOYEES

A Competency Based Certification (CBC) program shall be developed for each work center, including: operations, maintenance, administration, security, fire department, laboratory, utility system (i.e., water treatment, boiler plant, etc.), and fuel delivery branch. The work center CBC standards will be subdivided into grade level standards within each work center.

The CBC program shall include:

a. A description of the duties and responsibilities of tasks covered in the CBC standard.

b. A definition of how the employee will be evaluated and by whom. The evaluator must be fully qualified in the task included in the CBC standard and at least one grade higher than the individual being evaluated.

c. A checkoff list of required equipment and procedures the employee must be able to operate and understand. After the employee has satisfactorily completed an item on the checkoff list, it will be initialed by the evaluator.

d. A time frame for the completion of the CBC program.

Guidance on NAVSUP CBC training can be found in NAVSUPINST 12410.16, Guidance for Competency Based Certification (CBC) Training Program for Naval Supply Center Fuel Terminal Operations.

7.4 PERSONNEL QUALIFICATION STANDARD (PQS)

As outlined in the Aircraft Refueling Naval Air Training and Operating Procedures Standardization Program (NATOPS) Manual, NAVAIR 00-80T-109, all employees performing aviation fuel operations shall be trained and certified.

The training, as a minimum, shall consist of:

a. An informal course teaching the contents of NAVAIR 00-80T-109, MIL-HDBK-844 (AS), Aircraft Refueling Handbook, NAVFAC MO-230, Maintenance and Operation of Petroleum Fuel Facilities, MIL-HDBK-200, Quality Surveillance Handbook for Fuels, Lubricants and Related Products, and NAVSUP P-558.

b. A series of apprenticeship programs, i.e., on-the-job training (OJT), using NAVEDTRA 43288, PQS for Fuel Operations Ashore, for each system to be operated.

c. Attendance at an airfield indoctrination course as outlined in NAVAIR 00-80T-114, Air Traffic Control NATOPS Manual.

The certification process shall include a written and oral examination, as well as, direct observation of the employee performing the certified duties.

7.5 RECURRING TRAINING

Regardless of how familiar an employee is with his duties, periodic refresher training is mandatory. The purpose of this recurring training is to reinforce safe practices and procedures and to define responsibilities during emergency situations. Recurring training is also required to improve employee job performance in specialized areas.

7.5.1 Monthly Stand-Up Safety Meetings

In a well organized fuel department, safety meetings are regularly scheduled events in which all employees must participate to discuss relevant safety rules or instructions. Safety meetings will be held at least once a month and should be of one-half hour to one hour in duration. These meetings should be coordinated with the facility safety officer.

During the monthly meetings, important current safety material will be discussed. Potential subjects for discussion at these meetings are lifting and pulling heavy objects like fuel hoses, climbing ladders and stairs such as those on top of fuel trucks, eye and skin protection, driving trucks, spill control and fire prevention. Special meetings will be held to discuss accidents that have occurred during fuel operations and how each accident could have been prevented. In addition, give consideration to valuable ideas

from the employees.

7.5.2 Fire and Spill Control Drills

Fire and spill control drills will be addressed periodically, either during stand-up safety training or separately. In addition to this classroom training, actual fire and spill control drills will be conducted quarterly. These drills should be conducted by the facility fire department. At a minimum, the following will be addressed:

a. Fire and spill reporting procedures.

b. A review of exit routes for employees and equipment.

c. Location and use of spill containment materials and equipment.

d. Location and use of firefighting equipment and materials.

Selected personnel shall receive instruction in the use of all firefighting equipment available at the terminal. All fuel terminal personnel must be instructed in fire prevention and in basic firefighting techniques. Refresher training supplemented by firefighting practice will be held. Drills shall include what actions have to be initiated to close valves, stop pumps and contain spills, the first line of defense in containing any fire. See Chapter 9 for more information on fire safety.

7.5.3 Oil Skimmer Training

There are two types of training programs in oil skimmer use. The first type provides on-site, hands-on and classroom training for oil spill personnel in the deployment, use and retrieval of oil spill control equipment. This type of training is normally coordinated by the Navy On-Scene Coordinator (NOSC) and Naval Facilities Engineering Service Center (NFESC). The need for this type of training should be addressed to the local NOSC. The second type of training is directed toward facility personnel who operate and maintain the large DIP 3001 oil skimmer. This course is offered twice annually, once at NCBC Port Hueneme, California, and once at the Naval Station in Annapolis, Maryland. Requests to attend this course should be directed to NFESC. Per diem and travel expenses are the responsibility of the facility. In addition to these forms of formal training, each facility shall hold regular training sessions on how to deal with spills and how to deploy and use spill clean-up equipment and materials.

7.5.4 Specialized Training

Specialized training, which can be conducted on-site or at a training center, is intended to upgrade an employee's knowledge in a

particular subject, such as filter separator operations or quality assurance procedures. Specialized training is also required prior to the installation of new systems or modification of existing systems. An example of a specialized training is the Special Hazards Sessions, a safety session conducted before performing a special operation.

7.5.5 Review of Operations and Preventive Maintenance Procedures

To ensure that all employees are familiar with the content of the Operations and Maintenance Manuals, hold periodic training to review these manuals. At this training, stress standards for conducting various operations (e.g., loading a tanker) and performing routine maintenance tasks (e.g., valve maintenance).

7.6 SUPERVISORY TRAINING

New foremen must undergo an intensive training program during their first year as supervisors. This training will stress written and verbal communication skills, administrative procedures and organizational and personnel management. Training in these skills is necessary because most foremen have been promoted from the journeyman level and have had little formal training in these subjects. In addition to this intensive training program, foremen will also receive continuous training to update their supervisory skills.

7.7 TRAINING SCHEDULES AND RECORDS

Advance planning and scheduling for training will ensure that employees are receiving the training they require. It will help managers organize activities for maximum effectiveness. It is also vital to develop training schedules in advance so they can be included in the budget process.

The facility must maintain auditable records, including records for each individual, on the training programs that employees receive. Training records shall include all recurring training and special courses attended and CBC programs completed.

7.8 AIRCRAFT REFUELER/DEFUELER DRIVER TRAINING

NAVAIR 00-80T-109, Aircraft Refueling NATOPS Manual, Chapter 8, section 8.2.2, requires operators of fuel delivery vehicles to obtain a Motor Vehicles Operators Identification Card and comply with requirements delineated in NAVFAC P-300, Management of Transportation Equipment. A comprehensive driver training program should be developed to ensure all fuel delivery drivers have the knowledge and experience to properly and safely operate refueler vehicles. A sample driver training program is provided in Appendix 23.

Chapter Eight:
SAFETY

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CHAPTER EIGHT: SAFETY

8.1 INTRODUCTION

Safety is freedom from danger, risk, injury or loss. This freedom requires a vigilant, comprehensive safety program actively supported by all employees. The primary aim of a safety program is to increase the employee's awareness of the hazards and dangers involved in handling fuel. It is essential that personnel handling petroleum fuels and related equipment are thoroughly knowledgeable of the principle hazards to be encountered and how to prevent or reduce these hazards (see Exhibit 8-1). The safety program must instruct the employees how to eliminate the hazards or cope with them in a safe manner. Most accidents are caused by employees being complacent. Carelessness, not thinking about the job, and taking shortcuts to save time are attitudes just asking for accidents to happen. To minimize or prevent accidents, personnel must use common sense, concentrate on the job at hand, know and follow proper safety procedures. **DO NOT TAKE SHORTCUTS**. Do it right the first time, there may not be a second chance.

8.2 REFERENCES AND PUBLICATIONS

References that will be useful in establishing and maintaining a safe facility include the following:

29 CFR 1910	- Occupational Safety and Health Standards
29 CFR 1926	- Safety and Health Regulations for Construction
NFPA 30	- Flammable and Combustible Liquids Code
NFPA 30A	- Automotive and Marine Service Station Code
NFPA 45	- Standard on Fire Protection for Laboratories Using Chemicals
NFPA 77	- Recommended Practice on Static Electricity
NFPA 385	- Standard for Tank Vehicles for Flammable and Combustible Liquids
NAVFAC MO-230	- Maintenance and Operation of Petroleum Fuel Facilities

MIL-HDBK-201	- Military Standardization Handbook Petroleum Operations
NAVSEA S6470-AA-SAF-010	- U.S. Navy Gas Free Engineering Program Technical Manual
OPNAVINST 5100.23	- Navy Occupational Safety and Health Program
NAVPETOFFINST 10345.1	- Precautions to Tank Entry Guidelines for Leaded Fuel Tanks
NAVPETOFFINST 10341.1	- Handling Requirements and Safety Characteristics of JP5 Jet Fuel

8.3 WORKSITE ENVIRONMENT

The Fuel Officer is responsible for ensuring that personnel work in a safe and healthy environment. As part of this responsibility, annual industrial hygiene surveys are required to evaluate worksite safety and hygiene. Deficiencies noted during these surveys must be corrected in an expeditious manner. In addition, workers exposed to toxic and hazardous substances must be routinely monitored by medical personnel. Records of this monitoring program must be maintained for each worker.

8.4 TRAINING FOR A SAFETY PROGRAM

As discussed in Chapter 7, specialized training is needed to support a safety program. A good safety program requires regular and special training for all employees. New employees must be initiated in all aspects of safety; they must understand all safety procedures and reporting requirements for each activity they conduct before they begin work. Ongoing training programs shall be implemented so employees will periodically review safety measures.

8.4.1 Safety Meetings and Material

In a well-organized fuel department, safety meetings are regularly scheduled events in which all employees must participate to discuss safety rules or instructions pertinent to the operations in their particular areas. Safety meetings will be held at least once a month and should be of one-half hour to one hour in duration. During the monthly meetings, current and important safety material shall be discussed. In addition, consideration will be given to valuable ideas from the employees.

Instructional safety materials are available from the National Safety Council, the Code of Federal Regulations, state and local safety agencies, National Fire Protection Association, American Petroleum Institute and other federal safety agencies. Outside

speakers, such as policemen, fire department personnel, first aid course instructors, and manufacturer's safety experts may be asked to provide some variety of interest to the monthly safety meetings.

EXHIBIT 8-1

MANDATORY PRECAUTIONS FOR HANDLING PETROLEUM FUELS

The following precautionary measures are mandatory when dealing with or handling petroleum fuels.

- Consider all petroleum fuels to be potentially toxic and avoid physical contact with them.
- To avoid skin irritation, remove soiled or soaked clothing, take a bath or shower and wash the affected area with mild soap and warm water. Get medical advice if irritation, rash or burns persist.
- Before entering a tank, compartment or confined space, use an appropriate indicator to determine vapor and oxygen concentrations. If it exceeds allowable tolerances, do not enter the space without adequate personnel protective equipment. Be sure there is another person with you to stand watch outside the confined space at all times.
- Conditions in tanks and compartments are not constant. Even though a tank or compartment has previously been declared vapor free and lead free, changes in the weather, repairs using heat, mechanical cleaning or the escape of vapors from cracks and seams may be additional sources of petroleum or lead vapors. Keep an indicator on the job and make frequent checks of the atmosphere. Leave immediately if there is any sudden change (increase) in vapor concentration or signs of leaded sludge.
- Clearly mark sludge disposal areas with warning signs and barriers. Wear protective clothing if you must enter such areas.
- Mark all petroleum tanks with prominent signs to indicate type of product they contain or have contained (leaded fuels).
- Tanks which have previously contained petroleum products should never be used for potable water, unless the tanks have been specially prepared for water service. Never use a tank or container that has contained leaded gasoline for drinking water.

EXHIBIT 8-2

PROTECTIVE EQUIPMENT

- Respiratory Equipment. This equipment is used when working in confined spaces or in enclosures such as valve pits or sump pits when the air may be contaminated with harmful fumes, vapors, fogs, mists, gases, sprays, etc. For more detailed information concerning respiratory equipment, permissible practice, requirements, selection and maintenance refer to OSHA 29 CFR 1910.134 and International Oil Tanker and Terminal Safety Guide, second edition, Chapter 1, Section 1.5.

- Conductive Shoes. Conductive shoes are used by employees at fuel terminals because there is the danger of creating static electricity. In a fuel terminal, the creation and discharge of static electricity could be disastrous (see Section 8.7.3).

- Eye, Ear and Nose Protection. Eye, ear and nose protection is used where there is danger of inflicting injury to the eyes, ears, nose or face. Goggles are required to protect the eyes when using machinery or working in areas of dust, flying objects, etc. Protect your face by a face mask such as one used in welding. Ears can be protected by ear plugs which would be required when working in a high density noise area. For further information on face, eye and ear protection, refer to: OSHA 29 CFR 1910.151(c), Eye Protection; OSHA 29 CFR 1910. 133, Eye and Face Protection; OSHA 29 CFR 1910.135, Eye (goggles) Protection; OSHA 29 CFR 1910.252(e)(2), Face Protection for Welders; OSHA 29 CFR 1926.100, Hearing Protection; and OSHA 29 CFR 1926.102, Eye and Face Protection.

- Coveralls/Aprons. Coveralls/aprons are examples of personnel protective clothing used to diminish the risk of skin contact with an irritant such as petroleum fuels or acids. For further information concerning coveralls/aprons, refer to OSHA 29 CFR 1910.252(e)(3).

- Head Protectors. Head protectors are worn where there is a possibility of falling or swing objects or projections that may cause head injuries. Information concerning head protectors can be found in OSHA 29 CFR 1910.135, OSHA 29 CFR 1910.252(e)(2), and OSHA 29 CFR 1910.266(c)(iii).

- Safety Belts, Lifelines and Lanyards. These are used at fuel terminals during emergencies (e.g., rescue situations), tank cleaning operations or in situations where it is necessary to protect the individual from falling. More information on the subject can be obtained by referring to OSHA 29 CFR 1910.94(d)(11)(v), OSHA 29 CFR 1910.252(e)(4)(iv) dealing with safety belts; OSHA 29 CFR 1926.104, dealing with lifelines.

EXHIBIT 8-2 (continued)

o Safety Nets. Safety nets are used when work places are more than 25 feet above the ground, water or other surfaces and where the use of ladders, scaffolding, catch platforms, temporary floors, safety lines or belts is impractical. For further information, refer to OSHA 29 CFR 1926.105.

o Ring Buoys. These are located so that they are immediately available when employees work over or near the water. Refer to OSHA 29 CFR 1926.106 for more information on the subject.

8.4.2 Special Hazards Session

An important ingredient of a safety program is the special hazards session conducted prior to performing a special or unique operation. The supervisor will conduct this short session to ensure that the employees involved are completely cognizant of the potential hazards and the required safety procedures. Present the special hazard session prior to performing any maintenance or operation which is not routine and in which certain know hazards exist. For example, prior to entering a tank or before performing repairs at a pipeline leak site, a special hazard session must be conducted.

8.5 PERSONNEL PROTECTION AND LIFESAVING EQUIPMENT

Personnel engaged in hazardous operations must be provided with protective clothing and equipment. Supervisors are responsible for ensuring that employees wear the appropriate personnel protective apparel and use proper equipment in all operations where there is a potential for exposure to hazardous conditions. Protective equipment and apparel includes but is not limited to respirators, conductive shoes, eye/ear/nose and head protectors, coveralls, aprons, safety belts, lifelines or life vests. Exhibit 8-2 lists this equipment/apparel and provides a brief explanation of the what, why, when and where certain personnel protective equipment is used as well as references for detailed information.

8.6 SAFETY IN THE LABORATORY

Laboratory personnel are exposed to even greater hazards than fuel operator personnel. Working with chemicals in close quarters is especially hazardous. Basic laboratory precautions are listed in Exhibit 8-3. Minimum standards for the protection of human life and property when working in a POL laboratory include the following:

- o Training of laboratory personnel in basic fire prevention and fire emergency procedures;
- o Increased attention to the dangers of electrical systems and POL testing equipment;

- o Sufficient storage for and proper handling of flammable liquids and other hazardous chemicals;
- o Scheduled maintenance and inspection of laboratory equipment;
- o Adequate ventilation; and
- o Emergency fire blankets.

In addition to these standards, the following National Fire Protection Association (NFPA) and commonly accepted safety guidelines shall be followed:

a. Portable Fire Extinguishers. Portable fire extinguishers must be properly located and maintained in good working condition. Fire extinguishers must be rated for Class A, B and C (see 9.4) fires and must have UL or FM labels. Volume I, Section 10 of the NFPA National Fire Codes provides detailed information regarding selection, distribution, inspection and maintenance of portable fire extinguishers.

b. Alarm System. The alarm system should include both a fire alarm system and an automatic fire detection system. The system should be able to alert station or public fire department personnel. Signal transmission for fire alarms should be designed to activate alarms at more than one location. Volume 7, Section 72E of the NFPA Code provides information regarding selection, maintenance and testing of the various fire detection systems.

c. An Evacuation and Emergency Plan. It is vital to develop written procedures for laboratory emergencies. These procedures should include alarm actuation, personnel evacuation, equipment shutdown procedures and provisions for firefighting action, including detailed and specific plans for fire suppression operations to be supervised by the fire department. Emergency telephones, located exterior to the laboratory building, should be installed and connected directly to the fire department and emergency unit.

d. Emergency Eyewash, Shower. POL testing laboratories that handle corrosive materials or sufficient quantities of flammable or combustible materials shall maintain adequate protection devices to enhance personnel safety. These devices should include emergency showers and eyewash stations. Volume 4, Section 56C of the NFPA Code provides information regarding selection, placement and maintenance of the safety protection devices.

e. Means of Egress. POL testing laboratories shall provide at least two separate means of exit from the laboratory work area. This safety requirement is referenced in various building codes, NFPA manuals and 29 CFR.

EXHIBIT 8-3
LABORATORY PRECAUTIONS

Each laboratory shall have operating procedures that include all necessary safety considerations. A few general precautions are:

- o When in doubt concerning laboratory procedures or operation, consult with the authority responsible for developing the particular test method.
- o Pay attention to the test in progress. Do not leave your test unattended. If it becomes necessary to leave the laboratory even for a brief period of time when a test is in progress, request assistance and/or notify your supervisor.
- o Do not use shortcuts.
- o Do not engage in horseplay.
- o Do not use laboratory glassware as food and drinking containers.
- o Check the laboratory and equipment at the close of each day to be sure that no hazardous situations can develop.
- o Always wear rubber gloves when handling acids.
- o Ventilate laboratory and storerooms to prevent accumulation of flammable vapors.
- o Use fume hoods when working with toxic vapors.
- o Do not smoke in the laboratory.
- o Keep gas jets closed when not in use.
- o Never leave an open flame or heating element unattended.
- o Never pour volatile liquid where there are open flames or heating elements.
- o Discard organic products in authorized containers, never in sinks.
- o Never discard hot liquids in drains. Cool in covered containers before discarding.
- o Clean up areas immediately after a spill.
- o When diluting, pour acid into water. Never pour water into acid.
- o Do not use refrigerator that stores chemical material to store foods.

8.7 HAZARDS CONNECTED WITH FUEL HANDLING

The principle hazards and precautions regarding petroleum fuels are summarized below. It is essential that personnel handling these products become familiar with the hazards and safety aspects.

8.7.1 Vapors

Vapors from all petroleum products are hazardous not only because they constitute a fire and explosion hazard, but also because they may be toxic to the human body. Since the vapors from petroleum products create the greatest threat to life, the characteristics of vapors must be clearly understood by all personnel handling these substances. All petroleum vapors are very dangerous if breathed continuously. Breathing in an atmosphere with as little as 500 parts of vapor per 1,000,000 parts of air can cause a condition similar to severe alcoholic intoxication. Symptoms may include a brief initial state of excitement or exhilaration followed by disorientation, dizziness, nausea, unconsciousness and death.

8.7.2 Spontaneous Ignition

When larger masses of combustible material (which have been saturated with oil) are allowed to stand and heat is generated by slow oxidation, the temperature of the mass rises. If allowed to continue, the material will reach the ignition temperature and start a fire. See Chapter 9 for more on fire prevention.

Open flames from mechanical work and repairs involving heat from burning, cutting and welding are obvious sources of ignition. Other sources are smoking, sparks from smoking materials, flames from matches or lighters, friction sparks, shorts in electric currents and static electricity.

8.7.3 Static Electricity

The dangerous feature of static electricity is the spark discharge resulting from the accumulation of a static charge. In the presence of low flash petroleum products, it becomes disastrous. Static electricity can be generated by agitation of petroleum products (e.g., turbulence during tank filling, moving machinery or vehicles, or merely walking or moving in a dry atmosphere). Preventive measures, such as grounding of machines, equipment and self by wearing conductive shoes, are some examples of how to prevent static electricity discharges while working in close proximity of petroleum products. During fuel operations, the hazards from static electricity can be prevented by grounding or by reducing the pumping rate. In areas such as tank bottoms, where grounding is not possible, a reduced pumping rate should be used. This is sometimes called "cushioning the tank" and requires a pumping rate of less than 3 feet per second until the inlet is covered with 3 to 4 feet of

fuel. This action reduces turbulence and the potential for an explosive atmosphere at the inlet valve.

Products such as burner fuel, kerosene, diesel fuel, commercial aviation turbine fuel Jet A and JP5 are products with flash points above 38°C (100°F). Since these products normally are handled at temperatures below their flash points and do not normally create an explosive atmosphere, fire or explosive hazard is significantly reduced. However, a condition for ignition may exist if these products are handled at temperatures above their flash points and due care must be exercised.

8.7.4 **Petroleum Toxicity**

Liquid petroleum fuels, their vapors and some additive compounds which they may contain are potentially harmful to the human body. The degree of harm ranges from minor irritation to death. The seriousness of the damage caused by direct contact will depend upon the type of fuel, extent of contact, duration of contact and the part of the body affected. Care must be taken to wear the proper protective equipment at all times. Should contact with fuel occur, the affected area should be cleaned promptly. The following paragraphs describe specific recommended action(s).

8.7.4.1 **Fuel Oils, Diesel Fuels, Turbine Fuels and Kerosenes**. These liquid petroleum fuels are harmful and irritating to the skin. Contact with them will be avoided. If contact with these petroleum fuels is made, wipe the affected area with a dry rag and wash it with soap and water. Do not use solvents or gasoline as a cleaning agent.

Although fuel oils, diesel fuels and kerosenes are not poisonous, they must be kept out of the mouth, eyes, nose, ears and open cuts. If this happens, obtain first aid immediately (see Section 8.9). In addition, obtain medical aid immediately if the fuels enter the eyes or nose or are swallowed. If clothing or equipment becomes saturated with the liquid fuel, change as soon as possible. Prolonged wearing intensifies the irritation to the skin and increases the danger of fire.

Do not work in confined spaces or enclosures where fuel oil, diesel fuel or kerosene fuel vapors exist. The vapors can be toxic. Safety procedures for entering and working in confined spaces and enclosures containing the above fuel vapors are applicable and must be followed. Where concentration of hydrocarbon levels exceed 500 parts per million by volume, life-threatening hazards exist.

8.7.4.2 **Gasoline and Naphtha-based Fuels**. Gasoline is irritating to the skin. If allowed to remain in contact with the skin, it will cause severe burns. If clothing or equipment become saturated with gasoline, remove them. Prolonged wearing only intensifies the irritation to the skin and there is the danger of fire. Gasoline removes the protective oils from the skin and produces dryness,

roughness, chapping and cracking. Severe irritations or skin infection can follow this skin damage, which usually develops on the hands. Remove the gasoline with warm water and mild soap. If gasoline comes into contact with the tender tissue of the eyes, wash immediately with liberal amounts of tepid water, administer first aid and seek medical attention immediately. If gasoline is swallowed, it is exceedingly uncomfortable, irritating and can cause permanent damage. Seek medical attention immediately.

Gasoline vapors are toxic. If inhaled for more than a short time, dizziness, nausea and headaches occur. Heavier concentrations of gasoline vapors act as an anesthetic or cause unconsciousness. Immediately evacuate employees showing these symptoms when in a work area suspected of dangerously high concentrations of gasoline vapors. Persons overcome by gasoline vapors must be given first aid promptly. Do not return to the work area until the air quality of the work area has been tested, all the vapors in the work area have been removed and the work space has been certified safe for entry.

8.7.4.3 **Fuel Additives**. Fuel additives present the danger of toxic vapors and skin contamination. Extreme caution must be exercised when handling these substances.

Tetraethyl lead and tetramethyl lead (TEL/TML) are additives used in aviation gasoline and some motor gasolines (MOGAS) to improve the octane rating. Vapors from these additives are highly toxic. Direct contact with the concentrate from TEL/TML or its residue can result in serious permanent physical illness, brain damage or death. No person shall be permitted to enter a storage tank that has contained leaded gasoline without special equipment and complete instructions for its use.

A tank in use or having contained leaded gasoline must have the following warning stenciled above the manhole:

CAUTION: THIS TANK HAS CONTAINED LEADED FUEL. DO NOT ENTER TANK WITHOUT PERMISSION FROM FUEL OFFICER.

Fuel System Icing Inhibitor (FSII) also requires special handling. Currently there are two materials being used as FSII. Di-ethylene-glycol-mono-methyl-ether (DIEGME) is currently the only approved FSII additive for use in JP5 because of its high flash point. Ethylene-glycol-mono-methyl-ether (EGME) is the approved FSII material for use in both JP4 and JP8 fuels. Both FSII materials are considered mutagenic in the neat state; however, they are relatively safe once blended into fuel. Personnel involved in the handling and injection of these additives are advised to follow all guidance provided in the Material Safety Data Sheets, which includes wearing personal protective equipment and avoiding exposure by inhalation, injection and eye or skin contact.

Anti-Static Additive (ASA) increases the fuel's conductivity and helps relax static electric charges that are produced during fuel handling operations (filtration, pipeline movement, etc.). ASA is a brown, viscous liquid with a flash point of 73°F and a specific gravity of 0.93. It contains approximately two-thirds of a percent each of calcium and chromium.

Persons handling undiluted ASA must wear goggles to avoid any possibility of the product splashing into the eyes. In the event of eye contact, immediately wash the eye with water for 15 minutes and consult a doctor. Avoid repeated and prolonged skin contact and have available facilities for removing quickly and contamination from the skin with soap and water.

8.8 GAS-FREE ENGINEERING

The policies of the Department of the Navy regarding gas-free engineering for operations involving entry into or work in, on or adjacent to confined or enclosed spaces are contained in OPNAVINST 5100.23D. OPNAVINST 5100.23D, Chapter 27 prescribes the regulations and procedures applicable to confined or enclosed space entry and work and the minimum mandatory requirements for establishing and administering a gas-free engineering program. These regulations and procedures are applicable to all Naval shore activities, military and civilian personnel, and contractor operations and personnel when performing work aboard Naval facilities.

Before cleaning tanks or entering confined spaces, it is important to free the area of toxic, flammable vapors to ensure the safety of personnel. Vapor-freeing replaces hydrocarbon vapors with fresh air. Vapor indicators must be used to determine the progress of the vapor-freeing operations.

8.8.1 Vapor-Freeing Tanks for Cleaning

Three basic methods are available to free a tank of hydrocarbon vapors -- mechanical ventilation, steam ventilation and natural ventilation. Mechanical methods, such as drawing vapors from top man-ways by eductors or fans or forcing air through bottom shell man-ways by air, steam or electric fans, are relatively safe. Be sure the air mover is electrically bonded to the tank. Also, keep to a minimum the time during which the vapor content in the tank will be flammable.

Steam ventilation can present special hazards, such as generating static electricity or forming a vacuum from rapid steam condensation.

Natural ventilation is conducted by removing the roof and shell man-way covers. This is the least desirable method, however, because vapors can drift easily to an ignition source.

8.8.2 Entering Confined Spaces

The lack of ventilation in confined spaces presents special hazards to personnel who must work in these areas. It is vital to establish and maintain the proper procedures to avoid fires and injuries from oxygen deficiency, toxic substances and physical hazards.

Several precautions should be taken before entering confined spaces. These include:

- o Isolating the space from potentially hazardous material;
- o Removing sources of ignition;
- o Locking out electrical equipment to prevent inadvertent activation;
- o Removing or shielding radiation sources;
- o Testing the atmosphere in and around the area;
- o Providing adequate ventilation; and
- o Ensuring personnel have appropriate skin/eye protection and respiratory equipment.

8.8.3 Hot Work

Prior to commencing hot work in a confined or enclosed space, the space shall be tested, inspected, cleaned and ventilated, as required by the provisions of this manual, and certified "Safe For Hot Work." Extraneous flammable or combustible materials such as scrap wood, paper, rope, rags, etc., shall be removed from the space. Flammable materials shall be cleaned/removed from the space to a degree sufficient to eliminate any significant fire hazards. Combustible materials which cannot be removed shall be adequately protected. Ventilation ducting shall be of non-combustible metal or flexible construction and shall be free of hazardous levels of combustible residues.

8.9 FIRST AID

Contact with petroleum fuels can be extremely dangerous and will probably require immediate first aid. The first aid procedures to follow will depend on the nature of the contact. For example, skin irritation may only require washing the affected area, while swallowing fuel will likely require immediate medical attention. Exhibit 8-4 lists the procedures to follow for common accidents.

Further information concerning medical services and first aid can be found in references:

OSHA 29 CFR 1910.151	- Medical Services and First Aid
OSHA 29 CFR 1926.20; 23; 50	- General Safety and Occupational Health Provisions
American Red Cross	- Standard First Aid and Personal Safety Manual (Stock number 321116)
American Red Cross	- Cardiopulmonary Resuscitation (CPR)* Training Manual (Stock number 321907)

* CPR training is required to use this manual. All employees should be encouraged to attend formal CPR training.

EXHIBIT 8-4

FIRST AID FOR COMMON ACCIDENTS

- o Skin irritation. Remove soiled clothing. Take a shower and wash affected area with mild soap and warm water. If irritation, rash or burns persist, seek medical advice.

- o Petroleum fuels in the eye(s). Immediately flush the eye thoroughly with clean water and apply olive oil, castor oil or mineral oil. Obtain medical attention immediately.

- o Swallowing. Swallowing any significant amount of petroleum fuel should be regarded as serious. If the victim is unconscious, revive him and obtain medical aid immediately.

- o Inhalation of vapors. Get the victim into the open air as quickly as possible. If unconscious, revive him. If victim has stopped breathing, administer artificial respiration. Obtain medical aid immediately.

Chapter Nine:
FIRE PROTECTION

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CHAPTER NINE: FIRE PROTECTION

9.1 INTRODUCTION

Due to the flammable, combustible nature of petroleum products stored and handled within fuel terminals, the probability of fire is great. All personnel must be well trained in fire prevention, initial firefighting actions and reporting procedures. Proper training, including fire drills and a review of individual responsibilities, is mandatory for the preservation of human life and property.

At Navy fuel facilities where thousands of barrels of fuel are handled daily, hazards are always present. Safety instructions to deal with fires and accidents must be directed toward two objectives: (1) prevention and extinguishing and (2) first aid. The major objective, however, shall always be prevention. By applying the appropriate safeguards -- isolation, confinement, elimination of sources of ignition, prevention of rapid build-up of heat and pressure, and proper use of extinguishing equipment -- the prevention objective will be met.

9.2 REFERENCES

MIL-HDBK-201, Chapter 7	- Military Standardization Handbook, Petroleum Operations
29 CFR 1910.38, 106, 157, 158, 163, 165	- Code of Federal Regulations, Occupational Safety and Health Standards - Labor
NFPA 10, 14, 30, 77, 321, 385, 407, 704	- National Fire Protection Association
API Pub 1003	- Precautions Against Electrostatic Ignition During Loading of Tank Motor Vehicles
API Pub 2003	- Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents
API Pub 2008	- Safe Operation of Inland Bulk Plants
NAVFAC MO-117	- Maintenance of Fire Protection Systems
NAVFAC MO-230	- Maintenance Manual for Petroleum Fuel Facilities

International Oil Tanker and Terminal Safety Guide

9.3 ELEMENTS OF FIRE

For a petroleum fire to occur, three elements must be present at the same time and in the correct proportions. These elements are:

- o Fuel in the form of petroleum vapors;
- o Oxygen (air) to support combustion; and
- o A flame, spark or arc with enough energy to ignite the fire or enough heat to raise the temperature of the petroleum vapor to its ignition temperature.

Operating personnel must remember that in any operation they perform, two of the elements, air and fuel, are always present. The only other element is an ignition sources which, if not eliminated, will cause an explosion or a fire. Therefore, particular attention must be given to eliminating all possible sources of ignition.

Note that when petroleum is ignited, it is the vapor that burns -- not the liquid. Petroleum vapor, when mixed with a certain proportion of air, will burn. A gasoline vapor-air mixture containing about 1 percent to 7 percent gasoline vapor would have sufficient fuel (vapor) and sufficient oxygen (93 to 99 percent) to burn or explode.

If there is too little vapor (a lean mixture) or too much vapor (a rich mixture) in proportion to air, the mixture cannot burn. For example, under normal conditions, the vapors in a full gasoline tank are too rich to ignite. The nearly empty gasoline tank is more hazardous because there is sufficient air mixed with the gasoline vapor to support a fire or explosion if a spark or flame is introduced. Exhibit 9-1 is provided to assist in determining whether a given fuel at a given temperature is within the explosive range.

9.4 TYPES OF FIRES

Fires may be divided into three classes, each requiring different firefighting techniques and extinguishing agents. The Underwriters Laboratories (UL) Inc., categorize fires into these classes:

- o Class "A" fires, combustible material fires - Fires that have ordinary combustibles such as wood, brush, paper, grass, rags and rubbish.
- o Class "B" fires, flammable liquid fires - Fires consisting of flammable liquids such as gasoline and other fuels, solvents, lubricants, paints, greases, vegetable oil and similar substances.

- Class "C" fires, electrical fires - Fires that involve live electrical equipment such as wiring, motors, switches and transformers.

Any one or a combination of these classes can be encountered at a fuel terminal. Personnel must be familiar with firefighting procedures to handle any fire which could conceivably occur. Examples of common types of fires at fuel terminals are:

- Brush/grass fires
- Tank truck/rail car fires
- Pipeline break/hose rupture fires
- Vent or valve pit fires
- Pumphouse/manifold fires
- Storage tank fires
- Electrical/switch gear fires

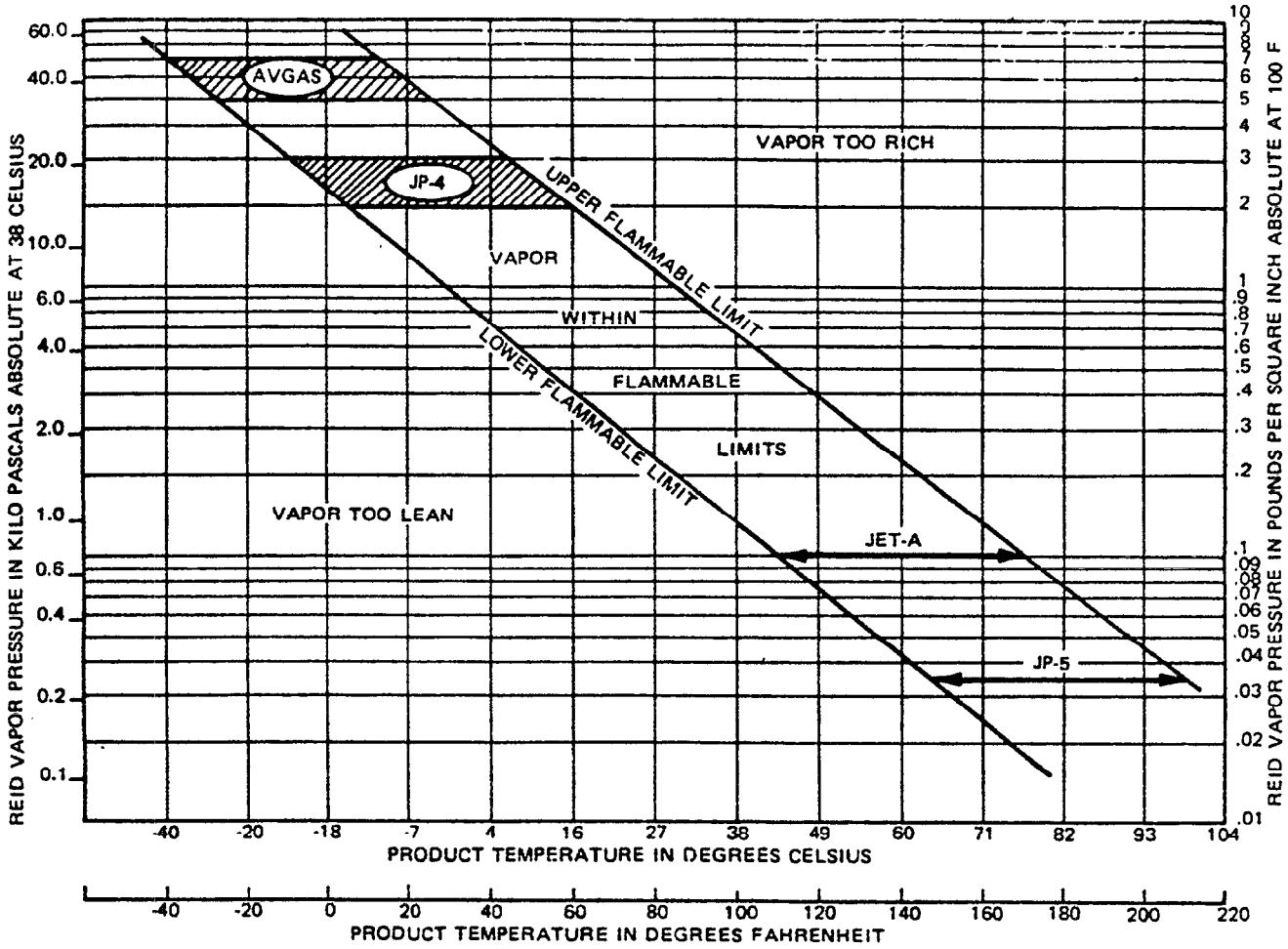
9.5 SOURCES OF IGNITION

Since all petroleum products at given temperatures and pressures furnish the first factor necessary for fire (fuels in the form of vapor) and since there is usually enough oxygen to support a fire, all possible sources of ignition must be effectively controlled. Some of the most common sources of ignition which must be controlled/eliminated at a fuel terminal include:

- Open flames, fires, lamps, lighted smoking materials, matches, cigarette lighters, torches and boilers.
- Hot flying particles such as embers, soot, grinding/welding and cutting sparks.
- Sparks or arcs from electrical equipment.
- Static discharges created by clothing, particularly wool, rayon and synthetic fabrics rubbing against the wearer's skin during normal body movement.
- Static discharges from ungrounded steam hoses, CO_2 nozzles and sand blast hoses.
- Static discharges emanating from liquid petroleum surfaces to gauging tapes or tank fittings during product transfers.
- Lightning strikes during electrical storms.
- Motor vehicle catalytic converters, aircraft radar transmitters.

EXHIBIT 9-1

RELATIONSHIP BETWEEN TEMPERATURE, RVP AND
FLAMMABLE LIMITS OF
PETROLEUM PRODUCTS AT SEA LEVEL



9.6 VAPOR SOURCES

Fires can be minimized by controlling or eliminating sources of vapor emissions. Some sources of petroleum vapor emissions that can be eliminated, minimized or prevented at fuel terminals are:

- o Spilled petroleum;
- o Improperly maintained tank vents that will allow the escape of hazardous petroleum vapors;
- o Sludge in bottoms of tanks being repaired;
- o Petroleum leakage into poorly ventilated pits, trenches, pump rooms;
- o Fuel stored in open containers;
- o Volatile fuels used for cleaning purposes; and
- o Improper storing of oily rags and oily wastes.

9.7 COMBUSTIBLE AND FLAMMABLE LIQUIDS

All petroleum products, being composed of carbon and hydrogen, will burn and are therefore said to be combustible materials. Any materials which can be ignited easily and which will burn with unusual rapidity are said to be flammable.

9.7.1 Combustible Liquids

According to the National Fire Protection Association (NFPA) Standards, combustible liquids are those liquids having flash points above 100°F (37.8°C). Combustible liquids shall be subdivided as follows:

a. Class II liquids include those having flash points at or above 100°F (37.8°C) and below 140°F (60°C).

b. Class IIIA liquids include those having flash points at or above 140°F (60°C) and below 200°F (93.4°C).

c. Class IIIB liquids include those having flash points at or above 200°F (93.4°C).

9.7.2 Flammable Liquids

Flammable liquids are liquids having a flash point below 100°F (37.8°C) and having a vapor pressure not exceeding 40 pounds per

square inch (absolute) at 100°F (37.8°C). Flammable liquids are known as Class I liquids. Class I liquids are subdivided as follows:

a. Class IA liquids include those having flash points below 73°F (22.8°C) and having a boiling point below 100°F (37.8°C).

b. Class IB liquids include those having flash points below 73°F (22.8°C) and having a boiling point at or above 100°F (37.8°C).

c. Class IC liquids include those having flash points at or above 73°F (22.8°C) and below 100°F (37.8°C).

9.7.2.1 **Flash Point**. Flash point is an index of the flammability of a petroleum product. It is the lowest temperature at which a liquid gives off sufficient vapor at its surface to form a vapor-air mixture that can be ignited momentarily.

9.7.2.2 **Fire Point**. The temperature to which the product must be heated to burn continuously when the mixture of vapor and air is ignited is known as the fire point.

9.7.2.3 **Volatility**. Volatility is the property of a liquid to vaporize readily at ambient temperatures and pressures. A volatile fuel, such as gasoline, is one that readily forms vapors at a low temperature and boils at a relatively low temperature. A good indicator of volatility is the flash point. Fuels likely to produce a flammable vapor-air mixture under normal handling conditions are gasolines and naphtha-based jet fuels (JP4).

Non-volatile fuels are not likely to produce a flammable vapor-air mixture under normal conditions. Nevertheless, these fuels will burn readily once they are ignited. Some non-volatile fuels are burner fuel oils, diesel fuels, kerosenes, and kerosene-based jet fuels (JP5).

9.8 PREVENTIVE MEASURES

Petroleum fires can be prevented by removing or changing one of the three required elements of fire (combustion): oxygen, vapor, or ignition. Since it is not always practical to control the amount of oxygen present, fires can be most easily prevented by controlling sources of ignition or the amount of petroleum vapors that may be present.

Some of these preventive measures can be accomplished by good equipment handling, proper equipment maintenance, good housekeeping, good operating procedures and good training.

9.8.1 Fire Control Plans

At fuel terminals, a fire control plan establishes the chain of command during a fire emergency. Some terminals have their own fire department responsible for coordinating and controlling all firefighting and associated activities.

Other terminals do not have their own fire departments. They must rely upon arrangements made with local fire departments and/or agencies to come to their aid in case of fire. Terminals without fire departments must designate persons to be responsible for establishing and maintaining a terminal fire, emergency plan, maintaining a firefighting equipment plan, conducting fire drills and inspections and designating firefighting duties and responsibilities to others (e.g., action of shore personnel at piers, tank farm personnel).

9.8.2 Firefighting Equipment Plan

A plan which shows the location and utilization of firefighting equipment in the terminal is known as a firefighting equipment plan. This plan will be included in the fuel department operations manual.

9.8.3 Fire Drills and Training

The extent of training in fire prevention and in firefighting given to fuel terminal personnel depends on whether there is a permanent firefighting unit attached to the terminal or whether arrangements have been made to procure speedy assistance from another source (see section 7.5.2).

9.8.4 Inspections

Zone inspections by the fuel terminal fire personnel shall be conducted and discrepancies reported to the department head for corrective action (see Exhibit 9-2).

9.8.5 Fire Watches

When open flame or heat producing work such as welding, cutting, brazing, etc., is to be conducted in the presence of combustible materials or flammable residues, a fire watch shall be established at the worksite. The fire watch shall be trained in the nature of any fires which might occur and in the proper use of the fire extinguishing equipment provided. Where hot work may increase the temperature in a wall, bulkhead or other separating structure,, thus creating a fire hazard on the opposite side of the structure, a fire watch shall also be established on the side opposite the worksite. A system of communication shall be established to permit the fire watch to convey the development of hazardous conditions on the opposite side of separating structures, and to signal the

necessity to stop hot work. The fire watch on the side of the separating structure opposite the hot work shall also be provided with and be trained in the use of fire extinguishing equipment suitable for the hazard.

9.9 PORTABLE FIREFIGHTING EQUIPMENT

For fires to exist, the right combination of fuel, oxygen and a source of heat (ignition) is required. Therefore, fires can be extinguished by the removal of either fuel, air or heat. The main aim of firefighting equipment and firefighting procedures, therefore, is to reduce temperature, remove the fuel or exclude air from the fire.

Portable firefighting equipment is designed to cope with fires of limited size. Portable firefighting equipment is necessary and desirable even though the property may be equipped with fixed fire protection equipment.

Extinguishing systems shall be selected for the specific class or classes of hazards to be protected in accordance with Exhibit 9-3.

9.9.1 Foam Extinguishers

Firefighting foam is a stable aggregate of small bubbles, lighter than oil or water, that flows freely over burning liquids and forms a tough continuous blanket to separate volatile combustible vapors and air. It resists disruption to wind, draft, heat and flame attack. It is also capable of resealing itself in case of a mechanical rupture. Furthermore, it clings to vertical and horizontal surfaces, thereby covering high risk areas. Foam retains these qualities for very long periods of time. The types of foams employed are air or mechanical foams, protein foams and synthetic foams. Foam is primarily used for Class "A" and "B" fires.

9.9.1.1 **Premix Foam Appliance**. Premix firefighting foam is particularly useful where fire water pumps are not available. A 30-gallon capacity premix foam appliance is very effective for use on fires at pier berths.

9.9.1.2 **Concentrate Wheeled Diaphragm Foam Proportioner Appliances**. This firefighting foam appliance is used where fire water is available to mix with a 30-gallon capacity foaming agent. Fresh, salt or brackish water may be used. The unit can be purchased with or without wheels and a 50-foot hose. It can be used with all foam liquids and can be operated by one man. It is particularly useful for fires at pier berths and in fuel tank storage areas.

9.9.1.3 **Foam Pumper Trucks**. Mobile foam pumper trucks carry their own water supply as well as an air foam concentrate and monitor nozzle. Naval Air Stations are equipped with an added capability of a dry chemical agent (especially potassium salt-type purple K) for

aircraft crash rescue purposes. This type of unit is a twin/dual agent pumper truck. The foam pumper truck is very versatile and effective. It is not dependent on the availability of water/foam. Since it can be transported to the fire, it is useful in facilities where it is difficult to predict the location of fires.

9.9.2 Dry Chemical Extinguishers

Extinguishers of this type are available as hand-held or wheeled units. Types of agents available are: sodium bicarbonate base, potassium bicarbonate base, potassium chloride base or potassium urea base. For use on flammable liquid fires, the stream should be directed at the base of the flame. Best results are obtained by attacking the edge of the flame and moving toward the back of the fire by a sweeping side-to-side action of the nozzle. Special precautions should be taken with this type of extinguisher to prevent re-ignition. These extinguishers are useful for Class "B" and "C" fires.

9.9.3 Carbon Dioxide (CO_2) Extinguishers

Carbon dioxide is an excellent smothering agent for extinguishing fires in closed spaces. The agent does not have a residue and penetrates into areas that cannot be reached by other means. Its use is recommended to protect machinery, electronic equipment or record storage. The agent is discharged in the form of a gas/snow cloud, over a relatively short range (three to eight feet). It is not recommended for use in areas which can experience winds. It should not be used as a fire prevention agent in pumprooms, tank spaces or on petroleum due to the possibility of generating static electricity.

9.9.4 Fire Blankets

Fire blankets are mainly effective for prompt extinguishing of burning clothes on personnel and are reserved for personnel use. If wet, they may be used to smother a fire at a vapor leak or vent. These are used for Class "A" fires only.

9.10 FIXED FIREFIGHTING EQUIPMENT

Fixed firefighting equipment is normally associated with areas where there is a large volume of fuel or high flow rates. Because these types of fuel are highly volatile, firefighting equipment is located nearby to be readily available in areas where a high potential for fire exists.

EXHIBIT 9-2

ZONE INSPECTION CHECKLIST

Zone inspections shall include the following:

- o Extinguishers shall be checked to see that they are properly tested, charged, protected, and available.
- o Fire water system shall be tested and protected against freezing and physical damage. These systems include hydrants, stand pipe drains, etc.
- o Fire hoses and coupling shall be examined for deterioration, quantity, pressure and adaptability to existing fire water system.
- o Electrical equipment, grounds, bonds and cathodic protection (which could be a source of ignition) shall be examined and reported if discrepancies are noted.
- o Dikes surrounding storage tanks and dike drains shall be checked for adequacy and operation.
- o Pumphouses shall be inspected for good housekeeping, product leaks, spills, proper ventilation and protection against sources of ignition.
- o Tank farms shall be inspected for good housekeeping. Weeds and brush growth shall be cut and removed from diked and tank areas.
- o Check areas near boiler plants heating installations for possible sources of flammable vapor release.
- o Check to see that "posted" signs of "NO SMOKING," etc., are posted in proper locations and rules are observed.
- o Check that all automatic fire doors and windows are maintained and free of obstruction.
- o Check all the permits covering hot work, cutting, welding, etc.
- o Check that all pipeline and valves, etc., are marked in accordance with MIL-STD-161, as applicable.

EXHIBIT 9-3

SELECTION OF EXTINGUISHERS BY HAZARD

Protecting Class "A" Hazards:	Water-base extinguishers, multi-purpose (ammonium phosphate base) dry chemical extinguishers, or Halon 1211 extinguishers.
Protecting Class "B" Hazards:	Carbon dioxide, dry chemical, Halon, and AFFF extinguishers.
Protecting Class "C" Hazards:	Carbon dioxide, dry chemical, or Halon extinguishers.

9.10.1 **Fire Water Mains**

At all fuel terminals where fire water pipelines are installed, the pipelines should extend near as possible to the heads of piers with a number of hydrant points. The hydrant points generally consist of headers with individually valved outlets fitted with a fire hose connection. Fresh water or sea water can be used. If the pier is restricted, the hydrant points shall be spaced not more than two or three standard hose lengths apart.

9.10.2 **Foam Mains**

Special conditions at some fuel terminal piers have warranted the provision of a pipeline for either foam solution or foam compound. These systems should be designed so that they can provide foam as close as possible to the area to be protected. Where such a system is provided, the line should have a number of hydrants. Where a pier is restricted, these hydrant points shall be spaced not more than two or three standard hose lengths apart. The hydrant points consist of a header fitted with two outlets individually valved and fitted with a fire hose connection. A foam solution pipeline of this type may be designed to receive solution from mobile appliances at 1000 gpm or fixed proportionate foam at 8000 gpm.

9.10.3 **Deluge System**

A deluge system dumps copious quantities of water on the fire to cool it. Such a system is not recommended for petroleum fires since it would carry the ignited fuel to unaffected areas. A fire water system must be designed so that the deluge systems or similar fixed cooling arrangements do not materially reduce the volume of water required for firefighting and foam applications.

9.10.4 **Aqueous Film Forming Foam (AFFF)**

AFFF concentrates are synthetic foaming liquids designed for use with fresh, sea, or brackish water. When mixed with water, these

specially formulated concentrates react and produce a foam (or gas-filled air bubbles) that spreads over the fuel, forming vapor sealing water film. Since the foam is lighter than the aqueous concentrate solution and lighter than the flammable or combustible liquid it floats on, it produces an air-excluding, cooling, continuous layer of vapor sealing water bearing material that extinguishes the fire and prevents further combustion (reflash). AFFF can also be used on spilled fuel to prevent ignition of vapors.

Fixed foam-generating equipment systems, such as the sub-surface foam injection system for tank structures, apply AFFF by injecting it below the liquid level of a burning petroleum storage tank. The foam floats to the top and extinguishes the fire. AFFF also can be applied at the top of the tank through foam chambers.

Existing water sprinkler systems can be adapted to discharge an AFFF agent.

9.10.5 Halogenated Extinguisher Agent

Halon 1301 is of chemical composition, that in terms of firefighting, does not "fight" fire physically but rather inhibits the flame and has a smothering action. By physically and chemically inhibiting the combustion reaction, Halon 1301 offers fast extinguishing and safety in the protected area. It is the only gaseous agent approved for use in occupied areas, since it is low in toxicity. However, it does displace oxygen, which requires immediate evaluation of the areas. Its main advantage is that it does not damage property and leaves no mess to clean up. After use in a fire, the area should be well ventilated before personnel are allowed to enter. It is particularly useful for Class "B" and "C" fires.

9.10.6 Alarm System

Some general guidelines for fire alarm systems and fire alarm response are provided below:

- The terminal fire alarm system or a ship's fire alarm, or both, will be operated immediately when a fire is detected.

- The Fire Control Center, normally the fuel terminal fire department, will be contacted as quickly as possible. Verbal communication is preferred and the following vital information should be relayed: nature of fire or emergency, name of tank farm involved (tank numbers, pumps, pipelines, etc.), name of ship and berth number, nature of immediate assistance required and nature of casualties.

- The terminal fire department is the site coordinator who will direct, provide, coordinate, and control all firefighting and associated activities. This coordination

would include movement to or from piers and the action of outside assistance personnel or authorities. It is mandatory, therefore, that adequate communication systems be provided linking forward fire control, land-based fire appliances (other local fire departments), water borne fire appliances (harbor authorities and services), tugs, rescue launches, ships at berth, medical service, police and other necessary authorities.

9.11 FIREFIGHTING PROCEDURES

All fuel terminals must publish terminal emergency procedures instructions that include actions to be taken in the event of fire or other emergency. This instruction must address:

- o Fire prevention procedures;
- o Location of fire alarms and emergency telephones;
- o Fire reporting procedures;
- o Evacuation procedures;
- o Location and use of firefighting equipment;
- o Mutual assistance agreements;
- o Firefighting coordination; and
- o After action report requirements.

This instruction should be incorporated into the fuel department's operations manual. Each major location (e.g., pier, pumphouse, valve pit, hose or pipeline, tank truck loading rack, reclamation plant, on all berths at the pier or tank farm) shall have permanently and conspicuously posted a copy of "INSTRUCTIONS IN CASE OF FIRE." See Exhibit 9-4 for a description of what firefighting techniques can be employed for special hazards.

EXHIBIT 9-4

FIREFIGHTING TECHNIQUES BY HAZARD

The following are some basic actions that can be taken to contain or minimize the risk of a major fire:

- o A minor spill should be attacked using dry chemical, foam extinguishers, or water fog or spray.

- o A large spill from a burst hose or loading arm should be fought with large dry chemical appliances, followed up with foam attack or water fog or spray. Surrounding risks of ignition should be cooled with water spray if foam is not used. If foam is used, no water spray should be used since water will carry away the protection the foam has provided.

- o A spillage of oil on surrounding waters shall be fought by emulsifying the oil with water jets or by applying foam coverage as appropriate.

- o Electrical fires shall be extinguished by switching off the power, and electrically isolating the location and using CO_2 or dry chemical extinguishers.

- o Bedding, clothing, wood, canvas, ropes, grass, or trash can be extinguished with large quantities of water (deluge or water sprinklers) or extinguishing agents containing large proportions of water. Cool surrounding area to prevent re-ignition.

- o Fire in cargo tanks shall be fought with foam or steam smothering. In the case of heavy oils, water fog or spray should be used.

- o Fire at sighting ullage ports shall be extinguished with direct chemical, foam jets or heavy water spray horizontally across the tank opening until it is possible to close the ports.

- o Pumproom or manifold fires shall be fought by shutting the pump power off and stopping ventilation. Use foam and water fog and spray as extinguishing agents.

Chapter Ten:
ENVIRONMENTAL PROTECTION

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CHAPTER TEN: ENVIRONMENTAL PROTECTION

10.1 INTRODUCTION

The Navy is committed to actively protecting and enhancing the quality of the environment by adhering to all applicable regulatory requirements and by preventing or controlling pollution caused by Navy facilities. There are also legal requirements to reinforce this commitment. The Navy's environmental protection program, as it applies to petroleum operations, is summarized in this chapter.

10.2 REFERENCES AND DIRECTIVES

Major environmental references on fuel operations are:

OPNAVINST 5090.1	- Environmental and Natural Resource Protection Manual
NAVPETOFFINST 4100.1	- Fuel Reclamation
NAVFAC P-908	- Oil Spill Control for Inland Waters and Harbor
NAVPETOFFINST 4025.2	- Handling, Storing, Recycling and/or Disposing of Contaminated Low Flash Petroleum Products
NAVFAC MO-230	- Maintenance and Operation of Fuel Facilities, Chapter 3, Environmental Protection
NAVFAC MO-911	- Utilization of Navy-Generated Waste Oils as Burner Oil
MIL-HDBK-1005/9	- Industrial and Oily Waste Water Control
API Standard 653	- Tank Inspection, Repair and Alteration
29 CFR 1910.120	- HAZWOPER Training
33 CFR 153-156	- Marine Terminal Regulations
40 CFR 60	- Air Regulations
40 CFR 112	- Oil Pollution Prevention
40 CFR 122	- Waste Water and NPDES Permits
40 CFR 266.4 and 279	- Used Oil
40 CFR 280	- UST Regulations

49 CFR 170-176	- DOT Tank Truck and Rail Car Regulations
49 CFR 194	- DOT Onshore Pipeline Regulations
EO 12088	- Federal Compliance with Pollution Control Standards
DOD Directive 6050.16	- Environmental Standards at Overseas Installations

DOD Overseas Environmental Baseline Guidance Document

DFSC Environmental Guide for Fuel Terminals

Oil Spill Response Technical Manual NEESA Code 112E3

10.3 BACKGROUND

The Navy's environmental protection program is delineated in OPNAVINST 5090.1B. This instruction shall be used as the primary guide in dealing with all environmental matters. Navy Facilities Engineering Command (NAVFAC) Manual MO-230, Maintenance and Operations of Fuel Facilities, Chapter 3 provides additional guidance concerning fuel related environmental matters. The organization assigned to assist Navy shore activities with environmental matters is the Naval Facilities Engineering Command (NAVFACENGCOM). Fuel facilities will usually deal with NAVFACENGCOM Engineering Field Divisions (EFDs) designated as the environmental focal point for site-specific environmental assistance. A map showing geographical areas of responsibility for each EFD, their address, and telephone number is provided in Appendix 17.

10.4 FUEL FACILITY ENVIRONMENTAL PROTECTION

At fuel facilities, the major area of environmental concern centers on the handling and storage of petroleum products. There are several environmental requirements which relate directly to fuel operations and facilities. In addition, personnel shall be familiar with reporting requirements, equipment, and training needs that support environmental programs. These subjects are discussed below.

10.4.1 Storage Tanks

This section provides information and guidance applicable to the regulation of both underground storage tanks (USTs) and aboveground storage tanks (ASTs) containing petroleum products. Additional information concerning this topic may be found in OPNAVINST 5090.1B, Chapter 16 and 40 CFR 280.

ASTs are not currently subject to Federal regulation beyond the petroleum pollution prevention and discharge reporting requirements of 40 CFR 110. Some states have new AST regulations and activities should contact their local EFD for specific information regarding compliance with these AST regulations and any subsequent project development. Although ASTs are not currently covered by Federal regulations, it is expected future legislation will address this issue.

Existing USTs which are governed by Federal, state, or local regulations will be either replaced or upgraded to meet corrosion protection and spill/overfill prevention standards by 22 December 1998. These regulations apply only to regulated USTs. As defined in 40 CFR 280.1, airport hydrant fuel distribution systems and field constructed tanks are excluded from the Federal UST regulations.

For those activities who have both an AST management plan and a UST management plan, the combination of both are referred to as a facility tank management plan. As more states regulate ASTs, fuel facilities will need to develop comprehensive tank management plans to comply.

10.4.2 Oil Management Ashore

EPA regulations control the marketing and burning of hazardous waste fuel and used oil. These regulations, which are extremely complex, essentially prohibit the burning of hazardous waste fuel and off specification used oil for energy recovery in "non-industrial boilers." To burn these fuels requires EPA notification and detailed analysis of the fuel to be burned. Detailed guidance on the handling and burning of used oils is provided in Appendix 18 and OPNAVINST 5090.1B, Chapter 9.

Each fuel facility shall develop a used oil management plan. This plan identifies sources of used oils, primary used oil segregation groups (i.e., on-spec used oil, off-spec used oil), recycling options, and detailed operational requirements. The plan should address any used oil burned for energy recovery (40 CFR 266.4 provides additional guidance on this subject). NAVFAC MO-911, Utilization of Navy-Generated Waste Oils as Burner Oil, provides specific guidance for the use of waste oils as a supplemental fuel in Navy boilers.

Reclaimed fuel is a used oil which has been subject to a process which allows it to be recovered and re-utilized as a usable product. Guidance concerning Navy fuel reclamation processes may be obtained through Navy Petroleum Office (NAVPETOFF) and the cognizant EFD. NAVPETOFF manages and controls a reclaimed petroleum product called Fuel Oil Reclaimed (FOR). NAVPETOFFINST 4100.1 provides additional guidance on this subject.

Guidance concerning the handling, storing, recycling, and/or disposal of contaminated low flash petroleum products can be found in NAVPETOFFINST 4025.2.

10.4.3 Oil and Hazardous Substance Contingency Planning

Chapter 10 of OPNAVINST 5090.1B provides detailed guidance concerning oil and hazardous substances (OHS) contingency planning and The Oil Pollution Act of 1990 (OPA 90). OPA 90 amends the Clean Water Act (CWA) to strengthen the National Response System, clarify Federal response authority, increase penalties for spills, require tank vessel and facility response plans. OPA 90 provides new requirements for spill response planning and training, drills and exercises.

A primary requirement of OPA 90 is to strengthen the National Response System. An outline of the Navy's OHS pollution response organization is provided in Appendix 19. Primary components of this system are Area Coordinators, who are responsible for developing area Contingency Plans (ACP), a Navy On-Scene Commander (NOSCDR) who is normally the Regional Environmental Coordinator, a Shoreside Commander or Facility Incident Commander (FIC), and a Facility On-Scene Coordinator. Note: The FIC replaces the Navy On-Scene Commander (NOSCDR) defined in earlier instructions. The Facility Response Plan (FRP) needs to identify personnel who have been assigned to each of the preceding components. Since these positions periodically change, care must be taken to update the FRP accordingly. The entire response structure is called the Incident Command System (ICS) and is critical to any FRP.

Commanders designated as NOSCs shall have an OHS contingency plan providing geographic coverage for the assigned area. NOSC plans shall conform to the contingency planning instructions issued by area coordinators and shall identify Navy facility assignments and responsibilities within the NOSC region. Facility Incident Commanders and Facility Response Coordinators need to be familiar with NOSC OHS contingency plans and integrate them into the FRP.

FRPs are required to be submitted by a broad range of activities. Four Federal agencies regulate the different categories of facilities required to submit FRPs. The U.S. Coast Guard (USCG) regulates deepwater ports and Marine Transportation-Related (MTR) facilities. These regulations are specified in 33 CFR 150 and 154. EPA regulates non-transportation related onshore facilities and these regulations are found in 40 CFR 112. The Research and Special Programs Administration (RSPA) regulates mobile facilities (tanks trucks, railroad cars, and portable tanks) and these regulations are found in 49 CFR 170-176. RSPA also regulates offshore facilities and pipelines and these regulations are found in 49 CFR 194.

Most Navy facilities fall under either USCG or EPA jurisdiction. Facilities that meet the criteria for more than one type of facility are called "complex facilities." No facility is required to have more than one FRP. However, that FRP must be submitted to every Federal agency that has jurisdiction over that facility. The best approach to complying with this requirement is to develop an FRP that meets the most stringent of the Federal or state requirements and then develop a cross reference sheet for each agency charged with oversight. It should be noted that a Spill Prevention Control and Countermeasures (SPCC) Plan is a separate document (see section 10.4.8), although some states have combined the FRP and SPCC into a separate plan. Assistance in developing site specific instructions can be obtained from the Navy On-Scene Coordinator (NOSC), cognizant EFD, or NAVPETOFF. Naval Facilities Engineering Command, Southern Division (SOUTHDIV) has developed a baseline FRP outline which can be utilized to develop site specific FRPs.

OPA 90 requires quarterly spill notification and emergency response procedures drills and subsequent evaluations of the responsiveness of established plans. OPA 90 also requires annual tabletop and equipment deployment drills and triennial "area exercises" intended to demonstrate and test worst case spill response capabilities. Additionally, OPA 90 provides for unannounced drills which may be conducted as frequently as on an annual basis. Activities need to document training procedures in the FRP and be prepared to conduct unannounced drills. See section 10.4.6 of this chapter for additional details concerning environmental training.

10.4.4 Spill Reporting

All Navy facility oil/hazardous substance discharges, regardless of quantity, that reach, or potentially reach navigable waters shall be reported immediately according to the procedures provided in Chapter 10, section 10-4.2 and 10-4.3 of OPNAVINST 5090.1B. The message format for reporting spills of oil/hazardous substance is provided in Appendix 20. **Note: All Navy shore activities should ensure that Navy Petroleum Office, their major claimant, Defense Fuel Supply Center (DFSC-F), cognizant Defense Fuel Region (DFR), and their environmental regional coordinators are included as info addees.**

10.4.5 Oil Spill Equipment

Materials needed to respond to oil spills can be broken into two categories: consumables and equipment. Consumables are those materials (i.e., sorbents, rags, etc.) which are utilized in bulk amounts to clean up oil spills, and equipment are those specialized long life items (i.e., boats, booms, and trucks) held in reserve to assist with oil spill clean up operations. The quantity and type of oil spill consumable materials are established and controlled by the local activity. The types of

oil spill control equipment and quantities at each facility is set by the activity, validated by the Naval Facilities Engineering Service Center (NFESC) and verified by the NOSC.

Appendix 21 provides some recommended items for stockpile in an oil spill response locker. Where possible, these items have been crossed to a national stock number. It is recommended that activities establish both a central spill locker and site lockers for those areas which would require quick and positive response actions. Note: Activities are responsible for establishment, stocking, and replenishment of these consumable materials.

The Annual Allowance and Requirements Review (AARR) is an inventory, by activity, of NAVFAC procured oil spill clean up equipment and its condition. Verification of the inventory worksheets is required annually. This worksheet is the basis for developing and justifying the budget for funding initial outfitting and equipment replacement. NFESC in Port Hueneme, California, is assigned the responsibility for procurement, inventory management, and reporting of oil spill equipment. Upon request, NFESC Code 422 is also available for design of permanent and non-permanent boom systems. Additional guidance concerning use of oil spill equipment may be found in the Oil Spill Response Technical Manual, prepared for the old NEESA Code 112E3 and available through NFESC Code 422 and NAVFAC Manual P-908, Oil Spill Control for Inland Waters and Harbors.

The oil spill clean up equipment subject to inventory is listed below. See Appendix 22 for a description of each type of equipment:

- o Large Skimmer (DIP 3001)
- o Boom Platform
- o Boom, Class I
- o Boom, Class II
- o Boom, Permanent
- o Boom Mooring Systems
- o Utility Boats (19' & 20')
- o Vacuum Trucks
- o Rapid Response Skimmers (will replace DIP 3001)

10.4.6 Oil Spill Training

Chapter 24 of OPNAVINST 5090.1B provides general guidance for environmental training. Each activity must establish specific training programs to comply with Occupational Safety and Health (OSH), Oil Pollution Act of 1990 (OPA 90), and applicable State regulations.

OSHA Hazardous Communication (HAZCOM) and Hazardous Waste Operations and Emergency Response (HAZWOPER) training requirements can be found in 29 CFR 1910.1200 and 1910.120

respectively. All personnel involved with fuel operations should have annual HAZCOM training. All personnel involved with oil spill clean up should have an initial 40 hours of HAZWOPER training followed by an 8 hour annual refresher.

NFESC in Port Hueneme, California, contracts for and manages annual training for oil spill On Scene Operations Team (OSOT) and Operations and Maintenance (O&M) of the DIP 3001 skimmer. OSOT training is given at various sites throughout the world and the O&M training is given twice annually at Port Hueneme. Interested activities can contact NFESC Code 422 at 805-982-4846 for additional details.

Training programs and required documentation need to be identified in both the Fuel Operations Manual and the OPA 90 Facilities Response Plan (FRP).

Activities should conduct full operational spill drills quarterly or as required by Federal, state, or local regulations.

10.4.7 Marine Fuel Terminal Operations

The Department of Transportation, through the U.S. Coast Guard and applicable Oil Pollution Prevention regulations (33 CFR 154.3), has jurisdiction over marine transportation related facilities, including piers, pipelines on piers and pier issue/ receipt facilities like marine loading arms and hoses. Activities with marine terminals can expect annual inspections by the Coast Guard. For those activities who desire to be thoroughly prepared for this inspection, a copy of the Bulk Facility Inspection Booklet, USCG publication CG-5562A (2-93), is available at NAVPETOFF.

Among other administrative matters, marine terminal inspections will check for written letters of intent, fuel operations manuals, letters of adequacy, designation of person's in charge, loading arm/fuel hose certifications, and declaration of inspections.

A letter of intent to operate the fuel facility should be on file and current. This document should be updated and forwarded to the USCG Captain of the Port (COTP) when the responsible officer changes.

The fuel operations manual should be in the format indicated in 33 CFR 154.3. In order to obtain a letter of adequacy, the fuel operations manual should be submitted to the COTP for review.

A list of person's in charge (PIC) needs to be on file and current. This document should be submitted to the COTP when designated personnel change. Any one individual who is responsible for a particular marine terminal evolution (i.e.,

loading or unloading of fuel) needs to be designated as a PIC. Each PIC must carry written designation with him or her at all times. Note: In order to be designated a PIC, documentation of training and experience is required and could be asked for during a marine terminal inspection.

Certifications of hose pressure tests and maximum burst pressures need to be on file.

10.4.8 Spill Prevention Control and Countermeasures (SPCC) Plan

Requirements for SPCC plans are addressed in 40 CFR 112.1 and 112.7, and OPNAVINST 5090.1B, section 9-4.2. SPCC plans are not required if the facility has an aggregate unburied storage capacity of 1,320 gallons or less of oil, (provided no single container capacity exceeds 660 gallons) and has a total underground storage capacity 42,000 gallons or less, or could not reasonably be expected to discharge oil into or upon the navigable waters of the U.S. At a minimum, this plan must include a description of containment facilities, diversionary piping, warning system and operating procedures. This plan must be reviewed and certified by a professional engineer every three years, or whenever there is a change in facilities or operations. Facilities which have experienced a spill into navigable waters of 1,000 gallons, or two reportable spills into navigable waters in any 12 month period, are required to submit SPCC plans to the EPA Regional Administrator within 60 days following such a spill.

SPCC plans will be maintained at the facility and be available to EPA Regional Administrators or their designated representatives, and state and local agencies for on-site review during normal working hours. A draft outline for developing facility SPCC plans is available from NFESC or NAVPETOFF. Cognizant EFDs should be contacted for further assistance concerning development and updating of SPCC plans.

10.5 OTHER ENVIRONMENTAL CONCERNS

In addition to oil, there are other pollutants that can affect the operations of fuel terminals. Normally, these types of pollutants are site-specific, so assistance in dealing with them should be obtained from the cognizant EFD.

10.5.1 Water

The major areas of environmental concern relating to water are point source discharges (for example, from a sewage treatment plant or an oily waste treatment plant), which require monitoring under provisions of the National Pollutant Discharge Elimination System (NPDES), and programs for dealing with potential ground water contamination. (For more information, see 40 CFR 122.21 and Chapter 7, section 7-3.8 of OPNAVINST 5090.1B.) Specific information about site-specific regulations on discharge

standards and reporting requirements can be obtained from the cognizant EFD.

10.5.2 Air

The Clean Air Act (CAA) establishes national ambient air quality standards (NAAQS). Achieving these standards is the responsibility of the states which must develop state implementation plans (SIPs) that outline to the EPA how each state will achieve and maintain the NAAQS. States may require pollution control measures which are more stringent than those mandated by EPA, but may under no circumstances allow measure which are less stringent.

Title V of the CAA created an operating permit program to be developed and implemented by the states per EPA regulations. The permit program attempts to clarify, in a single document, all the requirements applicable to a source.

In general, air pollution requirements can be classified according to whether the source is stationary or mobile. Stationary sources are further broken down into "major" and "area" categories. Activities should complete an emissions inventory of all stationary sources to determine if they are a major source. For more information, see 40 CFR 60 and Chapter 5 of OPNAVINST 5090.1B. Specific information and assistance about site-specific regulations can be obtained from the cognizant EFD.

10.5.3 Control of Hazardous Materials

OPNAVINST 5090.1B, Chapters 3 and 12 provide extensive guidance in this area. Generating, collecting, storing, and disposing of hazardous waste are extremely sensitive environmental areas. Fuel personnel should become familiar with the terms hazardous material (HM), hazardous substances (HS), and hazardous waste (HW). Specific definitions of these materials may be found in OPNAVINST 5090.1B 3-3.4 through 3-3.6. A very general definition of hazardous waste is any discarded material (liquid, solid or gaseous) that, because of its quantity concentration, physical, chemical or infectious characteristics may, when released or spilled, pose a substantial hazard to human health of the environment. In addition, to this general definition, the Environmental Protection Agency and state regulatory agencies have classified certain substances as hazardous by definition (for example, tetraethyl lead). Potential hazardous wastes of concern to fuel terminal personnel are slop fuels and tank bottom sludges. Due to the complicated nature of hazardous waste, the storage or disposal of these substances, whether on-site or off-site, should be coordinated with the local hazardous waste coordinator and the cognizant EFD. The hazardous waste coordinator should be able to provide information on hazardous waste minimization and compliance with

any local Consolidated Hazardous Material Reutilization and Inventory Management Programs (CHRIMP).

10.5.4 NEPA

The National Environmental Policy Act (NEPA) establishes policy, sets goals, and provides a means for carrying out environmental policy. NEPA mandates that Federal agencies utilize decision making tools to ensure knowledge of environmental impacts and compliance with various regulations. NEPA further requires a detailed statement on the environmental impact of major Federal actions that significantly affect the environment. Procedures must be in place to ensure that environmental information is available to decision makers and citizens before decisions are made and major Federal actions are taken. Additional information on NEPA may be found in OPNAVINST 5090.1B, Chapter 2.

10.5.5 Noise Pollution Ashore

OPNAVINST 5090.1B, Chapter 17 provides additional guidance concerning noise prevention ashore. The noise control act establishes standards to reduce noise emissions. Fuel facilities, especially Naval Air Stations need to be familiar with Air Installations Compatible Use Zones (AICUZ). The AICUZ program is designed to work with local communities to control generated noise. Specific information and assistance about site-specific regulations can be obtained from the cognizant EFD.

10.5.6 Natural Resources Management

There are a multitude of laws which govern the management of natural resources on Navy lands which are covered in OPNAVINST 5090.1B, Chapter 22, section 22-2. Of these regulations, the management of fish and wildlife, forest management, and wetlands management are important to fuel activities. Specific information and assistance about site-specific regulations can be obtained from the cognizant EFD.

10.5.7 Historical & Archeological Resources Protection

Specific guidance for management of historic and archeological resources may be found in OPNAVINST 5090.1B, Chapter 23. Specific information and assistance about site-specific regulations can be obtained from the cognizant EFD.

10.5.8 Overseas Environmental Programs

Environmental guidance for overseas activities may be found in OPNAVINST 5090.1B, Chapter 18. Governing directives include Executive Order (EO) 12088 of 13 October 1978, which requires Federal compliance with pollution control standards, DOD Directive 6050.16, establishment and implementation of environmental standards at overseas installations of

20 September 1991, and the DOD Overseas Environmental Baseline Guidance Document (OEBGD) of October 1992.

Executive Agents (EA) designated by the Secretary of Defense for each overseas area will publish Final Governing Standards (FGS) for their respective areas. FGS are country specific and provide, among other things, for technical limits on discharges and specific management practices with which installations must comply. FGS are the more stringent of host nation or OEBGD standards.

10.6 CORRECTION OF ENVIRONMENTAL DEFICIENCIES

There are two general types of deficiencies that could result in noncompliance with environmental standards. The first is caused by inaccurate or incomplete operation and maintenance procedures or failure of existing facilities and equipment that results in an incident (for example, an oil spill) in violation of existing environmental standards. The second type of violation stems from the imposition of new environmental standards that result in the noncompliance of historically adequate operations and maintenance procedures, equipment and facilities. To ensure that an activity does not violate existing or new environmental standards, continued review of operational and maintenance practices and an evaluation of equipment and facilities are required by facility personnel in conjunction with the local EFD. Additionally, a detailed assessment of the environmental and natural resources programs will be conducted every three years. Guidance concerning environmental compliance evaluations (ECE) may be found in OPNAVINST 5090.1B, Chapter 20.

10.6.1 Identification

The first step in correcting a deficiency is realizing that a problem exists. In some cases, the identification process may be extremely difficult because the individual conducting a review or evaluation is not aware of the standard being violated or the violation may not be readily apparent. For example, there may be concentrations of heavy metals in emissions from a boiler plant that are difficult to recognize. To solve this problem may require the assistance of an organization with in-depth expertise in the environmental area. For this reason, it is recommended that a close working relationship be established with organizations possessing this type of expertise, such as the Environmental Branch of the cognizant EFD and the Navy Petroleum Office. As part of this relationship, the facility will perform an annual self survey to completely review and evaluate operating and maintenance procedures as well as facility and equipment adequacy. Requests for assistance on these surveys should be made through an Engineering Service Request to the EFD or a request for a technical assistance visit by NAVPETOFF. Activities may conduct their own in-house environmental survey by utilizing and ECE checklist developed by SOUTHDIV. Upon request, a copy of this checklist is available from NAVPETOFF.

Once a deficiency has been identified, it is important to quantify the extent of the problem before defining the scope of corrective action. If the problem is related to inadequate or incomplete operation or maintenance procedures, it is recommended that NAVPETOFF be contacted to assist in changing or updating procedures. Problems associated with facility or equipment deficiencies should be evaluated by both NAVPETOFF and EFD personnel. When the extent of a facility or equipment deficiency has been defined, developing the scope of corrective action will normally be the joint responsibility of EFD and the activity staff civil engineer with NAVPETOFF acting as a technical advisor.

10.6.2 Documentation and Reporting

Project documentation development and submittal procedures for environmental projects are divided into two distinct categories: those environmental projects associated with Navy owned fuel, and those environmental projects associated with DLA/DFSC owned fuel.

Navy owned fuel is that fuel which has been purchased by the Navy for end use. Examples of Navy owned fuel are fuel used for heating plants or auxiliary power generation, and any end use fuel in a reclamation process. If an environmental project is associated with a facility or structure which receives, stores, or issues Navy owned fuel, the preparing activity needs to follow guidelines established by their major claimant for submitting such projects. As a preliminary to submitting these projects, activities need to ensure the deficiency is properly documented according to A-106 procedures. Commands may have previously been familiar with Pollution Control Reports (PCRs). With the publication of OPNAVINST 5090.1B, the use of PCRs has been discontinued and A-106 reporting procedures have taken its place. Additional information concerning A-106 reporting requirements may be found in OPNAVINST 5090.1B, Chapter 1, section 1-4.7. Development, submittal, and follow-up of these types of projects should be closely coordinated with NAVPETOFF and the respective major claimant.

If an environmental project is associated with a facility or structure which receives, stores, or issues DLA/DFSC owned fuel, the preparing activity needs to follow guidelines established by DFSC for submitting such projects. DFSC's Environmental Guide for Fuel Terminals, Chapter 7, provides some general guidance on this subject. Additionally, NAVPETOFF is preparing a guide for environmental project documentation which provides a more in-depth approach to environmental project documentation.

10.6.3 Funding

Funding for environmental projects is again broken down into two categories: those environmental projects associated with Navy owned fuel, and those environmental projects associated with DLA/DFSC owned fuel.

Funding for Navy owned projects should be sought through the activities major claimant and must be documented through the A-106 reporting program. Activities may also seek Defense Environmental Restoration Account (DERA) funds for environmental work associated directly with installation restoration (IR) projects. These funds are managed by Commander, Naval Facilities Engineering Command (COMNAVFACENGCOM). Specific information and assistance concerning DERA funding can be obtained from the cognizant EFD.

Funding for DLA/DFSC sponsored projects are documented and submitted annually under the Maintenance Repair and Environmental (MRE) program (see Chapter 6 for additional information concerning this program) and broken into two areas: specific environmental projects and recurring environmental costs projects. Specific environmental projects are documented and submitted on DD Form 1391 and must be forwarded to DFSC-FQ via major claimant and NAVPETOFF. Documentation in support of a request for funds for recurring environmental costs projects are submitted in accordance with guidance provided in Appendix L of the DFSC Environmental Guide for Fuel Terminals and also forwarded to DFSC-FQ via major claimant and NAVPETOFF. Contact NAVPETOFF Code 30 for additional information or assistance in preparing documentation in support of a DLA/DFSC sponsored environmental project or recurring environmental costs project.

The Navy's environmental protection program is delineated in OPNAVINST 5090.1. This instruction shall be used as the primary guide in dealing with all environmental matters. The organization assigned to assist Navy environmental shore activities is the Naval Facilities Engineering Command (NAVFACENGCOM). Fuel facilities will usually deal with NAVFACENGCOM Engineering Field Divisions (EFDs) designated as the environmental focal point for site-specific environmental assistance. A map showing geographical areas of responsibility for each EFD and the EFD environmental coordinator, addresses and telephone numbers is provided in Appendix 17.

General environmental matters, such as procedures to submit pollution abatement projects, can be handled by referring to guidance found in OPNAVINST 5090.1. If the guidance does not provide the details required, the cognizant EFD should be requested to provide the necessary assistance (for example, development of environmental projects).

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APPENDICES

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APPENDIX 1

LIST OF ACRONYMS AND ABBREVIATIONS

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LIST OF ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AARR	Annual Allowance and Requirements Review
ABF	Aviation Boatswain's Mate (Fuel)
AFFF	Aqueous Film Forming Foam
AIS	Annual Inspection Summary
API	American Petroleum Institute
ASA	Anti-Static Additive
AUTODIN	Automatic Digital Network
BS&W	Bottom Sediment and Water
CESO	Civil Engineering Support Office
CNO	Chief of Naval Operations
COCO	Contractor-Owned Contractor-Operated
COR	Contracting Officer's Representative
DEIS	Defense Energy Information System
DERA	Defense Environmental Restoration Account
DFAMS	Defense Fuel Automated Management System
DFR	Defense Fuel Region
DFSC	Defense Fuel Supply Center
DFSP	Defense Fuel Support Point
DLA	Defense Logistics Agency
DOD	Department of Defense
DON	Department of the Navy
ECIP	Energy Conservation Investment Program
EES	Environmental Engineering Survey
EFD	Engineering Field Division
EGL	Equipment Guide List

ESQD	Explosive Safety Quantity Distance
FDSO	Fuel Distribution Systems Operations
FEA	Fuel Exchange Agreement
FIP	Facility Inspection Program
FIR	Financial Inventory Report
FMSO	Fleet Material Support Office
FOB	Free On Board
FPD	Facilities Planning Document
FSII	Fuel System Icing Inhibitor
GBL	Government Bill of Lading
GOGO	Government-Owned Government-Operated
IAD	Inventory Adjustment Document
IMP	Inventory Management Plan
IPE	Industrial Plant Equipment
JPO	Joint Petroleum Office
LUST	Leaking Underground Storage Tanks
MEASURE	Metrology Automated System for Uniform Recall and Reporting
MILCON	Military Construction
MIP	Maintenance Index Page
MIPR	Military Interdepartmental Purchase Request
MOU	Memorandum of Understanding
MPMS	Manual of Petroleum Measurement Standards
MRC	Maintenance Requirement Cards
MRP	Maintenance and Repair Program
MSC	Military Sealift Command
MSR	Master Stock Records
NA	Narrative Assessment

NAS	Naval Air Station
NAVAIR	Naval Air Systems Command
NAVFAC	Naval Facilities Engineering Command
NAVOSH	Navy Occupational Safety and Health
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NCBC	Naval Construction Battalion Center
NEESA	Navy Energy and Environmental Support Activity
NOSC	Navy On-Scene Coordinator
NOSCDR	Navy On-Scene Commander
NOSHIP	Navy Occupation Safety and Health Inspection Program
NFPA	National Fire Protection Association
NRFC	Navy Regional Finance Center
NSF	Navy Stock Fund
OICC	Officer in Charge of Construction
OPN	Other Procurement, Navy
OSD	Office of the Secretary of Defense
OSO	Other Supply Officer
PC&S	Post, Camp and Stations
PDA	Procurement Defense Account
PECI	Productivity Enhancing Capital Investment
PIF	Productivity Investment Fund
PIPER	Planned Investment Program for Equipment Replacement
PMS	Planned Maintenance System
POL	Petroleum, Oil and Lubricants

PQS	Personal Qualification Standard
PWC	Public Works Center
PWD	Public Works Department
PWRMRP	Pre-Positioned War Reserve Material Requirements Protectable
QA	Quality Assurance
QS	Quality Surveillance
RDO	Redistribution Order
ROICC	Resident Officer in Charge of Construction
SAPO	Sub-Area Petroleum Office
SCE	Staff Civil Engineer
SIOATH	Source Identification and Ordering Authorization Form
SPCC	Spill Prevention Control and Countermeasures
TEL	Tetraethyl Lead
TML	Tetramethyl Lead
UL	Underwriters Laboratories
WIC	Work Input Control
WISP	Worldwide Inventory and Storage Plan
YO	Yard Oiler

APPENDIX 2

REFERENCES

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REFERENCES

(All DOD and Navy instructions, specifications and standards are listed by numeric series. Applicable indexes should be consulted to verify most current revision to each reference.)

Publication Number	Title	Referenced in Chapters
API RP-1110	Recommended Practice for the Pressure Testing of Liquid Petroleum Pipelines	5
API RP-2003	Protection Against Ignitions Arising Out of Static, Lightning and Stray Currents	9
API RP-2015	Cleaning Petroleum Storage Tanks	5
American Red Cross 321907	Cardiopulmonary Resuscitation (CPR) Training Manual	8
ASTM D-1085/ API STD 2545	Gauging Petroleum and Petroleum Products	8
ASTM D-1086/ API STD 2543	Measuring the Temperature of Petroleum and Petroleum Products	3
ASTM D-1250/ IP-200/API-2540	Petroleum Measurement Tables	3
ASTM D-4057	Standard Practice for Manual Sampling of Petroleum and Petroleum Products	4
ASTM Standards, Section 5	Annual Book of ASTM Standards; Petroleum Products, Lubricants and Fossil Fuels (Vols. 05.01-05.05)	4
CINCLANTFLTINST 4020.1	Atlantic Command Petroleum Operation	2
COMSCINST 3121.3	Tanker Operating Instruction (TANKOPINS)	2
DOD 4140.25-M	DOD Management of Bulk Petroleum Products, Natural Gas, and Coal	2,3,4,6
DOD 7200.10	Guidelines for Reporting Lost, Damaged or Destroyed Government Property	3
DLAM 4270.1	DLA Facilities Projects Manual	6

FED-STD-791	Lubricant, Liquid Fuel and Related Products; Methods of Testing	4
	International Oil Tanker and Terminal Safety Guide, Second Edition	8,9
MIL-HDBK-113	Guide for the Selection of Lubricants, Functional Fluids, Preservatives, and Specialty Products for Use in Ground Equipment Systems	4
MIL-HDBK-200	Quality Surveillance Handbook for Fuel, Lubricants and Related Products	2,4
MIL-HDBK-201	Military Standardization Handbook, Petroleum Operations	2,3,5,8,9
MIL-HDBK-210	Conversion Factors and Logistics Data for Petroleum Planning	2
MIL-HDBK-291(SH)	Cargo Tank Cleaning	5
MIL-HDBK-1008	Military Handbook, Fire Protection for Facilities Engineering, Design, and Construction	9
MIL-L-16644	Tapes, Measuring: Tank Gauging Type, with Reel and Plumb Bob	3
MIL-STD-101	Color Code for Pipelines and for Compressed Gas Cylinders	5
MIL-STD-109	Quality Assurance Terms and Definitions	4
MIL-STD-140	Petroleum Liquids; Procedure for Determining Normal Lost Expectancies for	3
MIL-STD-161	Identification Method for Bulk Petroleum Systems	5
MIL-STD-290	Packaging of Petroleum and Related Products	4
MIL-STD-45662	Military Standard; Calibration Systems Requirements	4

MIL-STD-457	Frequency for Inspection and Cleaning of Petroleum Fuel Operating and Storage Tanks	5
NFPA 30/45	National Fire Protection Association	8,9
NFPA 77	Static Electricity	8
NFPA 385	Tank Vehicles for Flammable and Combustible Liquids	8
NAVAIR 00-80T-109	Aircraft Refueling NATOPS Manual	4
NAVAIR 06-5-502	Aircraft Refueling for Shore Activities	2
NAVAIRINST 10300.3	Fuels, Lubricants and Associated Products Used by the North Atlantic Treaty Organization (NATO) and Armed Forces	4
NAVAIRINST 10340.3	Maintaining Quality and Limiting Contamination of Aircraft Fuels	2,4
NAVCOMPT Manual Volume 3	Appropriation Cost and Property Accounting (Field)	3
NAVCOMPT Manual Volume 8	Financial Inventory Accounting, Reporting and Billing	3
NAVCOMPTINST 7000.42	Single Point of Payment of CONUS Post, Camp and Station (PC&S) Petroleum Contracts	3
NAVEDTRA 10883	Fundamentals of Petroleum	7
NAVFAC DM-5	Civil Engineering	6
NAVFAC DM-8	Fire Protection Engineering	6
NAVFAC DM-22	Petroleum Fuel Facilities	6
NAVFAC DM-25	Waterfront Operational Facilities	6
NAVFAC P-72	Facilities Category Code	6
NAVFAC P-80	Facilities Planning for Naval Shore Activities	6
NAVFAC P-442	Economic Analysis Handbook	6
NAVFAC P-908	Oil Spill Control for Inland Waters and Harbors	9

NAVFAC MO-117	Maintenance of Fire Protection Systems	5,9
NAVFAC MO-230	Maintenance Manual Petroleum Fuel Facilities	2,5,8,9
NAVFAC MO-306	Maintenance Manual--Corrosion Prevention and Control	5
NAVFAC MO-307	Corrosion Control by Cathodic Protection	5
NAVFAC MO-321	Maintenance Management of Shore Facilities	5
NAVFAC MO-321.1	Maintenance Management of Public Works and Public Utilities for Small Activities	5
NAVFAC MO-322	Inspection for Maintenance of Public Works and Public Utilities	5
NAVFACINST 5100.14	Navy Occupational Safety and Health (NAVOSH) Deficiency Abatement Program Ashore	6
NAVFACINST 6240.3	Department of the Navy Pollution Control Reports; Responsibility and Guidance on Reporting of	6,10
NAVFACINST 11010.32	Military Construction Program Projects; Preparation of Supporting Documentation for (To be incorporated into NAVFACINST 11010.44)	6
NAVFACINST 11010.44	Shore Facilities Planning Manual	6
NAVFACINST 11010.57	Site Approval of Naval Shore Facilities (To be incorporated into NAVFACINST 11010.44)	6
NAVFACINST 11200.12	Civil Engineer Support Equipment (Transportation Equipment); Administration and Control of (To be incorporated into NAVFAC P-300)	6
NAVPETOFFINST 4020.1	Bulk Petroleum and Bulk Lube Oil Requirements	3
NAVPETOFFINST 4020.2	Navy POL Laboratories; Locations and Testing Capabilities	2

NAVPETOFFINST 4025.2	Handling, Storing, Recycling and/or Disposing of Contaminated Low Flash Petroleum Products	10
NAVPETOFFINST 4100.1	Fuel Reclamation	2,6,10
NAVPETOFFINST 4400.1	Handling Requirements for Bulk Lubricating Oils	2
NAVPETOFFINST 10340.1	Drumming Procedures	2
NAVPETOFFINST 10341.1	Handling Requirements and Safety Characteristics of JP5 Jet Fuel	8
NAVPETOFFINST 10345.1	Precautions to Tank Entry Guidelines for Leaded Fuel Tanks	8
NAVPETOFFNOTE 4265	Revised DOD Standard Prices and Pricing Guidance for Petroleum Products (Cognizance 9X and 1B Material)	3
NAVSEA S6470-AA-SAF-010	U.S. Navy Gas Free Engineering Program Technical Manual	8
NAVSUP Manual Volume II	Supply Procedures Ashore	2,3
NAVSUPINST 4020.8	Fuel Exchange Agreements with Foreign Military Forces	3
NAVSUPINST 4355.5	Petroleum Procurement Quality Assurance Manual	2
NAVSUPINST 4440.115	Physical Inventory Program	3
NAVSUPINST 4730.1	Overseas Laboratories for Support of Quality Surveillance of Petroleum Products	4
NAVSUPINST 4750.1	Planned Maintenance System for Bulk Fuel Shore Facilities	5
NAVSUPINST 6240.2	Oil Pollution Prevention, Control and Abatement of Bulk Fuel Facilities; Guidelines/Procedures and Assignment of Responsibilities for	10
NAVSUPINST 12410.16	Guidance for Competency Based Certification (CBC) Training Program for Naval Supply Center Fuel Terminal Operations	7

NAVSUP P-485	Afloat Supply Procedures	3
NAVSUP P-546	Pilferage of Petroleum	3
OPNAVINST 4020.25	Control and Accountability for Ground Fuels	2,3
OPNAVINST 4020.26	Fuel Exchange Agreements with Foreign Military Forces	3
OPNAVINST 4100.8	Defense Energy Information System	2
OPNAVINST 5090.1	Environmental and Natural Resources Protection Manual	2,10
OPNAVINST 5100.23	Navy Occupational Safety and Health Program	8
OPNAVINST 5530.14	Physical Security Ashore	2
OPNAVINST 11010.20	Facilities Project Manual	6
OPNAVINST 11010.34	Instructions for Preparation and Submission of the Annual Inspection Summary and Narrative Assessment	6
29 CFR 1910	Code of Federal Regulations, Occupational Safety and Health Administration	4,6,8
29 CFR 1910.151	Medical Services and First Aid	8
29 CFR 1926	Construction Industry-OSHA Standards	6,8
29 CFR 1926.20; 23; 50	General Safety and Occupational Health Provisions	8
33 CFR 154	Oil Pollution Regulations for Marine Transfer Facilities	2,10
40 CFR 112	Oil Pollution Prevention	2,10

APPENDIX 3

SAMPLE STANDARD OPERATING PROCEDURE FOR RECEIPT OF FUEL FROM A TANKER

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SAMPLE STANDARD OPERATING PROCEDURE FOR RECEIPT OF FUEL FROM A TANKER

I. Preparation

The standard operation outlined below is provided as an example of a tanker receipt operation. It is only a guide and is not intended to be used as a standard operation for a given receipt operation.

a. Administrative

(1) Review tank inventories and requirements to rotate stocks
(2) Prepare operations order
(3) Discuss sequence of operation with foreman

b. Tank Selection

(1) Provide room for receipt
(2) Drain or strip water
(3) Ensure valves and tank vents are in good working order
(4) Check and clear pipelines
(5) Select an overflow tank (i.e., an extra tank to take unexpected quantities)
(6) If the tanker arrives during the shift change, double check valve, tank and pumps
(7) Pack all pipelines to be used

c. Berth Selection

(1) Verify room and depth of water required
(2) Notify vessel of berth location
(3) Select manifolds and check valves
(4) Clear area of unnecessary equipment
(5) Provide sample container for line sampler
(6) Check type and serviceability of slings, dollies, and hoses
(7) Check communications (radios, walkie talkies, telephones)
(8) Ready oil spill recovery equipment and absorbent material
(9) Plug scuppers

d. Assignment of Personnel

(1) Assign an adequate number of personnel
(2) Ensure those assigned have adequate experience
(3) Notify each assigned person of his specific tasks
(4) Ensure personnel have proper safety equipment (gloves, hard hats, safety shoes)
(5) Provide Dock Master to spot vessel to appropriate manifold

(6) Provide or arrange for line handlers

e. Equipment and Fittings

(1) Select proper size and number of hoses
(2) Ensure flanges and gaskets on loading arms and hoses are in good condition
(3) Provide sampling gear and gauging tapes
(4) Check condition of bonding cables
(5) Have appropriate forms and log books on hand

f. Fire Protection

(1) Ready fire hose and test fire main
(2) Have adequate fire protection equipment and personnel assigned
(3) Notify security personnel to be aware of visitors, personnel leaving vessel
(4) Enforce no smoking/open flame rules

II. Vessel Preparation

a. Berthing

(1) Dock Master establish communication with pilot
(2) Spot the ship so that manifolds are aligned
(3) Secure lines
(4) Assist in lowering gangway
(5) Connect bonding cables
(6) Sign Notice of Readiness

b. Inspection on Vessel

(1) Inspector establish communication with Chief Mate
(2) Inspect tank and valve seals
(3) Vessel personnel take open ullages, water cuts and temperatures (empty tanks should be inspected or ullaged). Shore personnel witness this evolution.
(4) Vessel personnel compute volumes on board. Shore personnel witness.
(5) Inspector take samples of tanks and take them ashore for testing
(6) Inspector report results of test to operations foreman
(7) Sign Declaration of Inspection

c. Inspection Ashore

(1) Shore personnel gauge, water cut and take temperature of receiving tanks. Vessel personnel should be invited to witness this evolution.
(2) Shore personnel inform foreman that gauge evolution is completed

d. Connect Vessel

(1) Connect loading arms or hoses
(2) Shore personnel inspect connections and manifolds
(3) Shore personnel inform foreman that connection is completed
(4) Ensure drip pans are in place

To reduce tanker laytime, items b, c and d are normally done concurrently.

III. Discharge of Fuel

a. Fuel supervisor gives approval to start discharge.

b. Vessel starts discharges at a reduced rate.

c. Tank receipt verification should be made within 15 minutes of start of discharge.

d. Inspect manifolds, hoses, pipeline for leaks.

e. Vessel give approval to begin discharge at normal rate not to exceed pier manifold pressure.

f. Perform check gauge of shore tanks every 45 minutes.

g. Check vessel discharge rate every 45 minutes.

h. Conduct line patrol every 45 minutes.

i. Pull line samples at beginning, middle and end of discharge.

j. Log pier manifold pressure and any unusual condition every hour.

k. Obtain a standby notice from the vessel 15 minutes prior to shut down.

IV. End of Discharge

a. Inspect Vessel

(1) Vessel personnel gauge, water cut and take temperatures of tanks. Shore personnel witness the evolution.

(2) Empty tanks are certified as dry by shore personnel (if there is any fuel in the tank, it must be gauged).
(3) Vessel personnel calculate volumes of product remaining on board. Shore personnel witness calculation.
(4) DD Form 250 prepared by ships personnel certifying how much product was discharged. A copy of the DD Form 250 is provided to shore personnel.

b. Shore Inspection

(1) Shore personnel gauge, water cut and take temperature of receiving tanks. Vessel personnel may witness gauging.
(2) Calculate volumes of product received.
(3) DD Form 250-1 prepared by shore personnel and a copy given to vessel personnel.

NOTE: Discrepancies between vessel and shore volumes are reconciled at this time. Differences which cannot be reconciled will be investigated and reasons for discrepancy documented on a DD Form 1149 or DD Form 200.

c. Secure all valves.

d. Disconnect and cap loading arms and hoses.

e. Disconnect bonding cables.

f. Vessel Departs

(1) Assist in raising gangway
(2) Cast off shore lines

V. Post Discharge

a. Inspect equipment, hose and pipelines used in transfer.

b. Restow equipment (i.e., hoses, forklifts, dollies).

c. After product has settled, fuel inspector pulls samples for full laboratory analysis.

d. Analysis listed on tank ready-for-issue information.

APPENDIX 4

SAMPLE OPERATING PROCEDURES FOR PUMPING STATION

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SAMPLE OPERATING PROCEDURES FOR PUMPING STATION

The standard procedure outlined below is provided as an example of a pumphouse operating procedure. It is provided only as a guide and is not intended to be used as a specific operating procedure for a given pumphouse.

I. Description

The pump station is equipped with two flooded suction centrifugal pumps rated at 600 gpm. Pumps are driven by a reduction gear via a 150 hp electric motor. Pumps are equipped with the following apparatus:

a. Pump inlet and discharge valve
b. Suction and discharge vacuum/pressure gauges
c. Pressure relief valve and line
d. Air escape valve
e. Bearing oil cups
f. Duplex strainers
g. Oil cooled gear reduction box
h. Start and stop switch
i. Pressure operated safety switch

Pumps are supplied from a 30,000 bbl tank via an 8" pipeline and discharged into a common discharge header and transfer main to pier delta. Recommended pump start-up procedures:

a. Establish communications.

b. Check oil level on bearing cup oilers. Add oil if the oil level is below the red line on the oil cup. Use only 30W oil MIL-SPEC _____.

c. Check oil level in reduction gear box. Add oil if level is below the "Add Oil Line" on the dipstick. Use only 90W gear oil MIL SPEC _____.

d. Check pumps and pipeline for leaks.

e. Open pump inlet valve.

f. Prior to starting the pump, ensure the proper valve alignment from the tank to the discharge point has been checked.

g. Start the pump upon the command from fuel control.

h. Open the pump discharge valve door.

i. Ensure the pump is operating at normal operating pressure and temperature (i.e., 90 psi @ 90°F).

j. Log pump number, starting time, pumping pressure and temperature in pumphouse operating log.

II. Operating Procedures

Pump checks conducted during pump operations are extremely site specific and will depend on the operations being conducted and the type pumps and monitoring equipment. For this reason, procedures in the area must be developed locally.

III. Procedures to Stop the Pumps

a. Push the pump stop button upon the command from fuel control.

b. Close pump discharge and inlet valves.

c. Close other valves as required.

d. Log the time the pump was stopped.

IV. Emergency Pump Stopping Procedures

a. Stop pump upon the command from fuel control or if other emergency conditions develop; i.e., fuel leak, pump overheating.

b. If the pump continues to run after the stop pump button has been pressed, secure the power source for these pumps at the electrical vault.

c. Report all unusual conditions to the fuel supervisor.

d. Log all emergency situations and conditions in the pumphouse log.

e. Close inlet and discharge valves.

f. Secure pumphouse valves as required.

APPENDIX 5

SAMPLE LOGS

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APPENDIX 5
LOGS (Minimum information requirements)

STRIPPING LOG (WATER LEVELS ONLY)								
DATE	TANK	START TIME	STOP TIME	TOTAL TIME	START GAUGE	STOP GAUGE	QUANTITY STRIPPED	OPERATOR
7 Nov	11	0815	0820	5	0' 1/8"	0' 0 1/4"	217	Davis
7 Nov	11A	0830	0840	10	0' 1 1/4"	0' 0 1/4"	193	Davis
7 Nov	17	0900	0910	10	0' 2"	0' 0 1/2"	284	Davis

The stripping log. Used to document changes in tank water bottoms as a result of water bottom draw-down or stripping of tanks. If desired, two lines can be used to document changes in water and product levels.

PASSDOWN (EVENT) LOG			
DATE	TIME	EVENT	OPERATOR
7 Nov	0330	CDO Visit	Jones
7 Nov	0800	Night shift relieved, logs revised	Taylor
7 Nov	0900	Alarm system down for PM.	Taylor

The passdown log. A hand written log normally maintained by the controller or dispatcher to document events as they occur, i.e., off-hour visitors, fuel spills, system breakdowns, etc.

PIER (EVENT) LOG			
DATE	TIME	EVENT	OPERATOR
7 Nov	1000	YON 107 docked/secured.	Jones
7 Nov	1030	YON 107 gauged and sampled.	Jones
7 Nov	1055	Hoses connected and checked.	Jones
7 Nov	1110	Pumping commenced.	Jones

The pier log. Serves much the same purpose as the passdown log but documents event applicable to the pier only. Some information may be duplicated in the passdown log.

PUMPHOUSE LOG			
DATE	TIME	EVENT	OPERATOR
7 Nov	1110	Receipt of YON 107 commenced	Davis
7 Nov	1200	Receipt continued pressures normal	Davis
7 Nov	1300	Receipt shut down to repair leak in main manifold valve B17	Davis

The pumphouse log. The pumphouse log is a record of events that must be made known to all who may operate equipment and systems within a pumphouse. Events such as receipts, equipment breakdown and maintenance actions are examples of entries applicable to the pumphouse log.

BARGE LOG						
DATE	PRODUCT	TIME START	DRAFT AT START	DRAFT AT END	TIME STOP	QUANTITY
7 Nov	JP5	1110	12' 4"	3' 7½"	2115	368417

The barge log. The barge log serves as a historical record of issues to and pumping action by barges used to transport fuel product.

RUNNING GAUGE LOG						
DATE	TANK	TIME	GAUGE	QUANTITY	MAX LEVEL	OPERATOR
7 Nov	14	1030	4' 7 3/8"	221070	533442	Davis
7 Nov	14	1135	5' 4½"	255 86	533442	Davis
7 Nov	14	1230	6' 0 5/8"	286319	533442	Davis
7 Nov	14	1330	6' 8 5/8"	316587	533442	Davis

APPENDIX 6

SAMPLE OPERATIONS ORDER

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SPECIFIC OR RECURRING OPERATIONS ORDER

Order No.: _____ Issued by: _____ Date: _____ Time: _____

Passed to: _____ Date: _____ Time: _____

Passed to: _____ Date: _____ Time: _____

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1. Type Product: _____ Est. Amount: _____

2. Operation: Receipt by: Tanker ____ Barge ____ Pipeline ____ Rail Car ____
   Issue to: Tanker ____ Barge ____ Pipeline ____ Rail Car ____

   Transfer From: _____ To: _____

3. Est. Start: Date _____ Time _____ / Est. Stop: Date _____ Time _____

4. Tank(s) to be Used: _____

5. Berth/Pipeline/Railhead to be Used: _____

6. Header(s)/Rack(s)/Manifold(s) to be Used: _____

7. Valve Alignment for Initiating Operation: _____

8. Valve Alignment for Securing Operation: _____

9. Fuel Samples Taken From/At: _____

10. Name of Vessel: _____

11. Number and Size of Hoses/Loading Arms to be Used: _____

    _____

12. Type of Support Equipment Required: _____

13. Telephones Connected/Communication Established: _____

14. Emergency Procedures and Contacts: _____

    _____

    _____

    _____

15. Remarks/Special Instructions: _____

    _____

    _____

    _____

    _____

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APPENDIX 7

DLA OWNED INVENTORY MANAGEMENT

PART A: DFAMS TRANSACTION REPORTING

PART B: NAVY DFSP MONTHLY INVENTORY RECONCILIATION

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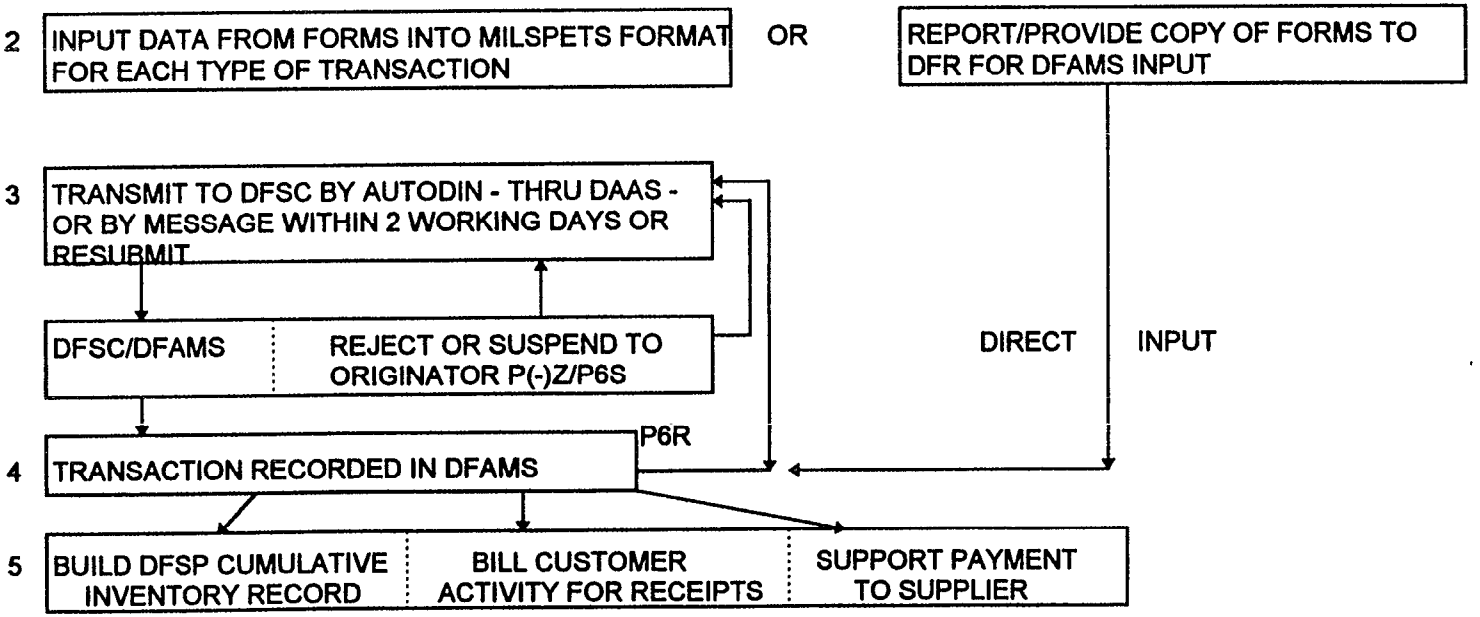
PART A

DFAMS TRANSACTION REPORTING

1 DOCUMENTATION BY DFSP OR CUSTOMER		PURPOSE/USE
DD-1155	- ORDER FOR SUPPLIES & SERVICES	- ORDERS ON DFSC CONTRACTS
DD-250	- MATERIAL INSPECTION & RECEIVING REPORT	- SHIPMENTS/RECEIPTS FROM INDUSTRY AND DFSPs
DD 250-1	- TANKER/BARGE MIRR	- SHIPMENTS/RECEIPTS BY BARGE OR TANKER
DD-1149	- REQUISITION & INVOICE SHIPPING DOCUMENT	- REQUISITIONS, SHIPMENT, RECEIPT FOR DFSP SUPPORT
		- REQUISITIONS, SHIPMENT, RECEIPT FOR DFSP SUPPORT
DD-1348 & DD-1348-1	- DOD SINGLE LINE REQUISITON, RELEASE, RECEIPT DOCUMENT	- DFAMS PHYSICAL INVENTORY, INVENTORY ADJUSTMENT, CONDITION/IDENTITY CHANGES



PART B:

NAVY DFSP MONTHLY INVENTORY RECONCILIATION

DFSP ACTIONS		DFSC/DFAMS ACTIONS
1. Conduct ending inventory as of 0800, 1st calendar day of each product and additive.		
2. Prepare DD-1348-1s for: - Physical inventory of each product - Operating gain/loss by product for month (OPTIONAL) - Identity change for additives injected--if not done previously		
3. Prepare MILSPETS formats and transmit to DFSC/DFAMS by 3rd calendar day: - P43 identity changes (if required) - P42 inventory adjustments (optional) - P41 physical inventories P41 must be last transaction transmitted	MANDATORY →	4. Upon receipt of P41 and/or P42/P43 for each product run reconciliation program. If reconciliation is successful proceed to step 8. If not proceed to steps 5 thru 7.
	← AS REQUIRED	5. Transmit P6D with management Code 11, 12 or 13 if 6. reconciliation cannot be accomplished; no P41 received, missing or rejected transactions during month, gains/losses exceed allowable or do not match P42.
6. Correct/retransmit rejected or missing transaction identified by DFSC.	←	
		7. Rerun reconciliation on receipt of corrected/missing transactions-repeat 5 and 6 until accomplished.
9. Verify Document Register against all transaction documents, sign certification (Responsible Officer) and file at DFSP.	MANDATORY ←	8. Transmit P6D with management Code 17 when reconciliation is accomplished. Mail hard copy of Document Register for verification, signature of Responsible Officer and file at DFSP.
10. If missing transactions or errors are identified after reconciliation resubmit to DFSC/DFAMS.		11. DFAMS will run re-reconciliation, transmit P6B with Management Code 18 and mail Revised Document Register.

APPENDIX 8

POST, CAMP AND STATIONS

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POST, CAMP AND STATIONS (GROUND FUELS)

ORDERS

(CONUS) Send two copies of DD1155, to contractor and three signed copies within one working day to:

Defense Finance Accounting Center
Columbus Center Fuel Stock Fund
Accounting Branch
ATTN: DFAS-CO-SFP
P.O. Box 182317
Columbus, OH 43218-6252

RECEIPTS

FUEL BRANCH RESPONSIBILITIES*

1. Inspect delivery vehicle to ensure: (Note 1)

   a. Seals are in place and numbers are the same as noted on delivery documentation

   b. Volumes delivered are corrected to 60°F.

   c. Delivery meters have been calibrated (semiannually)

   d. There is no contamination (i.e., water, sediment, etc.).

2. Verify amount received by measuring tanks before and after delivery. If amount received is different from amount shipped, annotate on delivery document.

↓

STOCK CONTROL DEPT. RESPONSIBILITIES

See diagram for DBOF Receipts (Appendix 9)

↓

FINANCIAL CONTROL DEPT. RESPONSIBILITIES

See diagram for DBOF Receipts

ISSUES

FUEL BRANCH RESPONSIBILITIES**

1. Complete issue documentation which includes: (Note 1)

   a. Vehicle ID number
   b. Vehicle mileage
   c, Amount issued
   d. Time issued
   e. Name and signature of driver and attendant

2. Calibrate issue meters (semiannually)

3. Secure issue facility when not in use. (Key Control)

↓ **Issue Documentation**

STOCK CONTROL DEPT. RESPONSIBILITIES

See diagram for DBOF Issues (Appendix 9)

↓

FINANCIAL CONTROL DEPT. RESPONSIBILITIES

See diagram for DBOF issues

(CONUS)

Receipt Documentation (DD 250 or DD 1155)

Three signed copies within one working day to:
Defense Finance Accounting Center
Columbus Center Fuel Stock Fund Acctg Branch
ATTN: DFAS-CO-SFP
P.O. Box 182317
Columbus, OH 43218-6252

INVENTORIES

FUEL BRANCH RESPONSIBILITIES

1. Conduct daily inventory of active tanks. (Note 1)
2. Conduct weekly inventory of inactive tanks. (Note 1)
3. Conduct formal inventory of all tanks monthly. (Note 2)

NOTES:
(1) OPNAVINST 4020.25A Encl (1)
(2) NAVSUPINST 4440.115

* The exact method of delivery and verification procedures should be included in the site specific Post, Camp and Stations contract.

** Special attention should be given to the control and verification of issues to non-end users (i.e., bulk issues to POL tank trucks which deliver fuel to fixed equipment or to vehicles which do not receive fuel at service stations) and issues made after normal working hours.

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APPENDIX 9

DBOF RECEIPTS AND ISSUES

PART A: DBOF RECEIPT OF DLA PRODUCT FROM A DIRECT DELIVERY CONTRACT

PART B: ISSUES FROM DBOF ACTIVITY TO END USER

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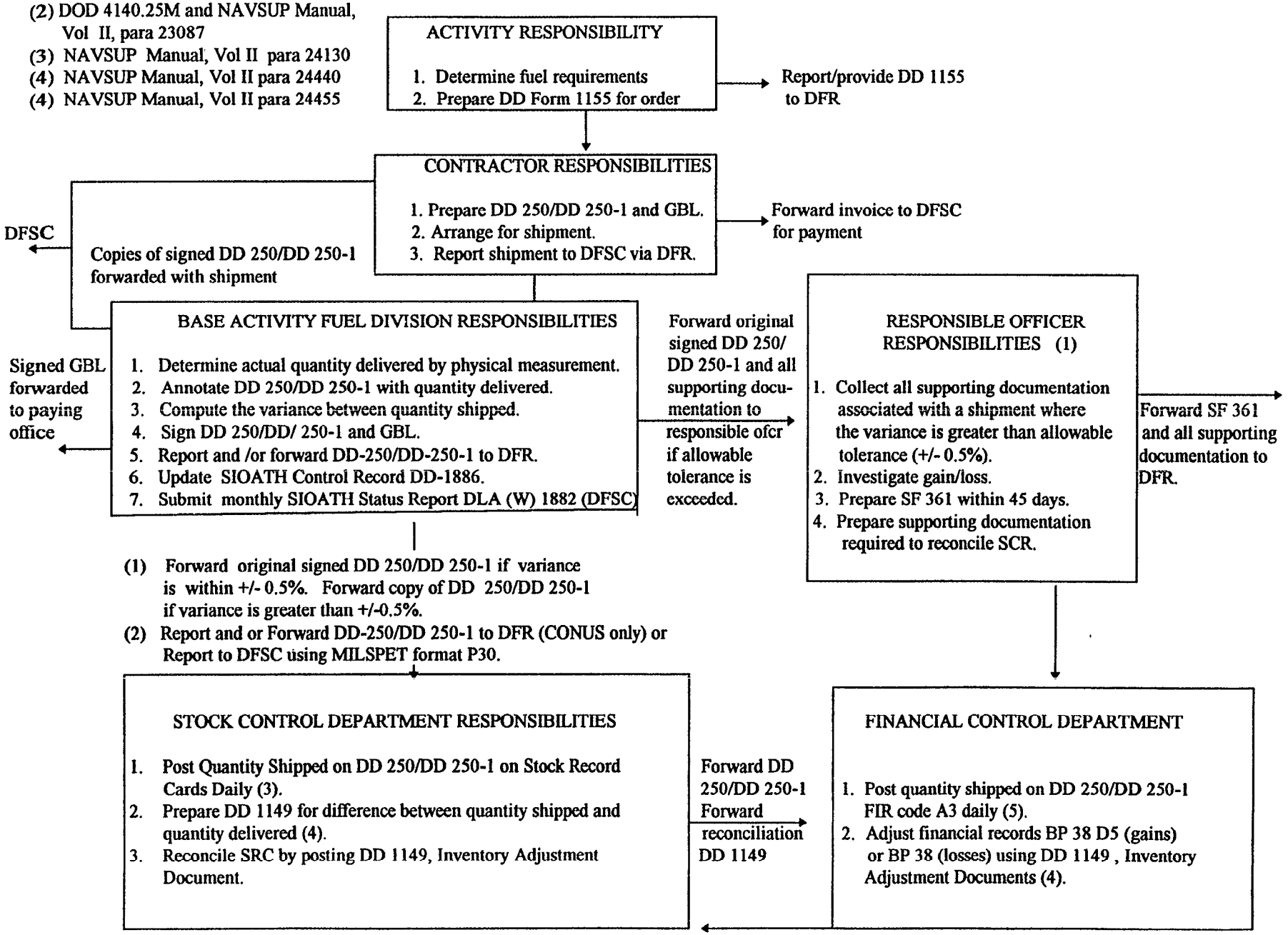
PART A:

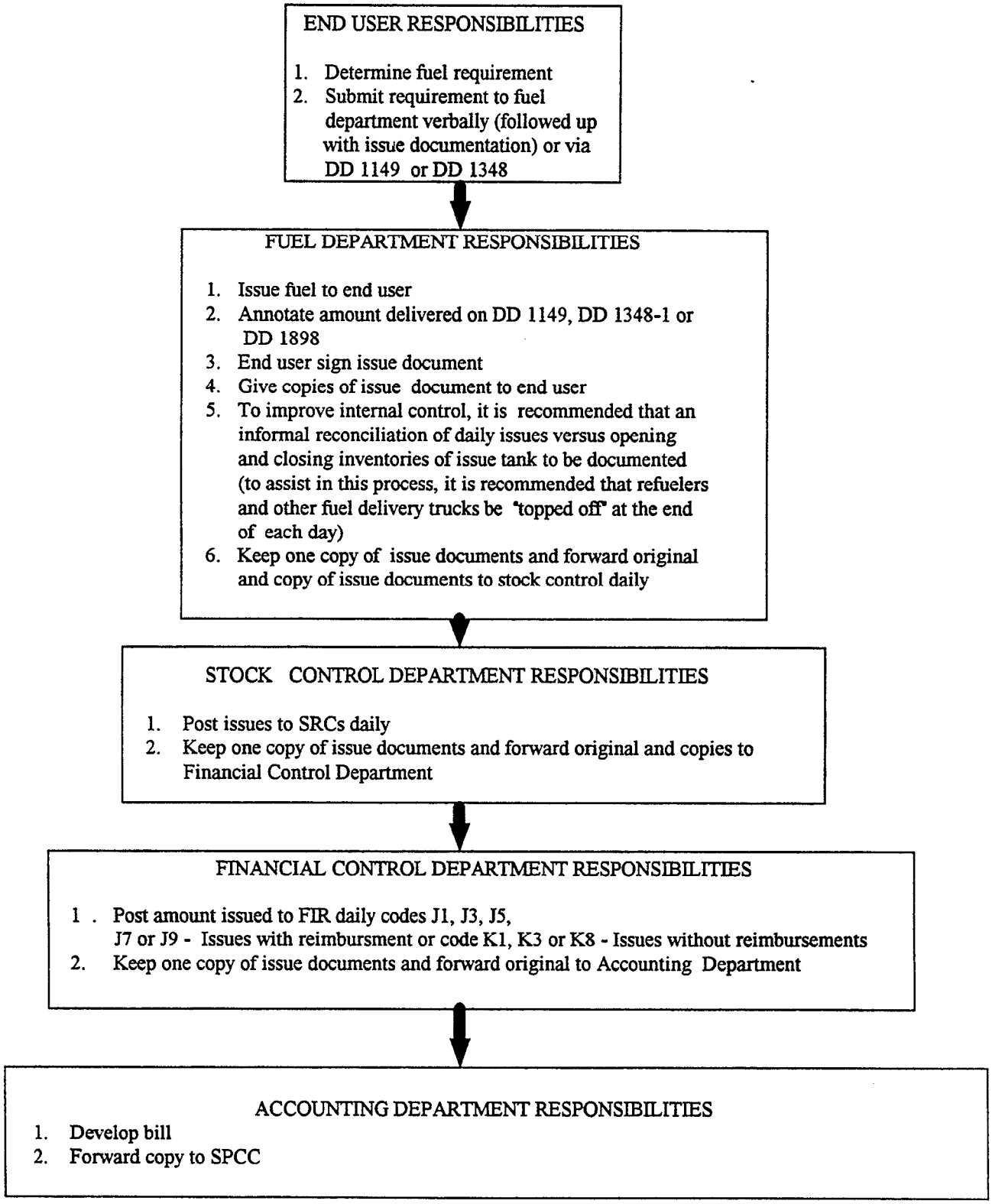
NOTES:
(1) DOD 4140.25M
(2) DOD 4140.25M and NAVSUP Manual, Vol II, para 23087
(3) NAVSUP Manual, Vol II para 24130
(4) NAVSUP Manual, Vol II para 24440
(4) NAVSUP Manual, Vol II para 24455

DBOF RECEIPT OF DLA PRODUCT FROM A DIRECT DELIVERY CONTRACT



PART B:

ISSUES FROM DBOF FUND ACTIVITY TO END USER



APPENDIX 10

MONTHLY INVENTORY REPORT

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DATE_____

GAUGER_____

WITNESS_____

MONTHLY INVENTORY

Tank Inventory (Product; i.e., JP5) for each tank

1. Gauge Reading _____
2. Water Cut Reading _____
3. Gross volume from strapping table (item 1) _____
4. Gross water from strapping table (item 2) _____
5. Gross volume of fuel (item 3-item 4) _____
6. Temperature of fuel in Tank °F _____
7. Measured API _____
8. Measured temperature of API sample °F _____
9. API @ 60°F from Table 5B using items 7 & 8 _____
10. Correction factor from Table 6B using items 6 and 9 _____
11. Net quantity (item 5 x item 10) _____

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APPENDIX 11

NAVY FISC POL TESTING LABORATORIES

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EAST COAST

FISC NORFOLK (HIGHEST) TESTING CAPABILITY:

AIRCRAFT TURBINE	*B-2*
DIESEL FUEL	B-2
HEATING FUEL	B-2
BUNKER FUEL	B-2
AIRCRAFT LUBES/HYD FLUIDS	B-2
GROUND LUBES/HYD FLUIDS	B-2
AVIATION GASOLINE	B-3
AUTOMOTIVE GASOLINE	B-3

FISC JACKSONVILLE (HIGHEST) TESTING CAPABILITY:

AUTOMOTIVE GASOLINE	*B-2*
AIRCRAFT FUELS	B-1
AVIATION GASOLINE	B-1
DIESEL FUEL	B-1
BUNKER FUEL	B-1
HEATING FUEL	C
AIRCRAFT LUBES/HYD FLUIDS	C
GROUND LUBES/HYD FLUIDS	C

WEST COAST

FISC PUGET SOUND (HIGHEST) TESTING CAPABILITY:

AVIATION FUELS	*B-2*
AVIATION GASOLINE	B-2
DIESEL FUEL	B-2
AUTOMOTIVE GASOLINE	B-2
HEATING FUEL	B-2
BUNKER FUEL	B-2
AIRCRAFT LUBES/HYD FLUIDS	B-2
GROUND LUBES/HYD FLUIDS	B-2

FISC SAN DIEGO (HIGHEST) TESTING CAPABILITY:

AIRCRAFT TURBINE	*B-2*
DIESEL FUEL	B-2
BUNKER FUEL	B-2
HEATING FUEL	B-1
AVIATION GASOLINE	B-3
AUTOMOTIVE GASOLINE	B-3
AIRCRAFT LUBES/HYD FLUIDS	C
GROUND LUBES/HYD FLUIDS	C

PACIFIC AREA

FISC PEARL HARBOR (HIGHEST) TESTING CAPABILITY:

ENVIRONMENTAL/WASTE	*A*
AIRCRAFT TURBINE	B-2
AVIATION GASOLINE	B-2
DIESEL FUEL	B-2
AUTOMOTIVE GASOLINE	B-2
HEATING FUEL	B-2
BUNKER FUEL	B-2
AIRCRAFT LUBES/HYD FLUIDS	B-2
GROUND LUBES/HYD FLUIDS	B-2
AIRCRAFT/GROUND GREASES	B-2

FISC GUAM (HIGHEST) TESTING CAPABILITY:

AIRCRAFT TURBINE	*B-2*
AVIATION GASOLINE	B-2
DIESEL FUEL	B-2
AUTOMOTIVE GASOLINE	B-2
HEATING FUEL	B-2
BUNKER FUEL	B-2
AIRCRAFT LUBES/HYD FLUIDS	B-2
GROUND LUBES/HYD FLUIDS	B-2
AIRCRAFT/GROUND GREASES	B-2

FISC YOKOSUKA, DET SASEBO (HIGHEST) TESTING CAPABILITY:

ENVIRONMENTAL/WASTE	*A*
AVIATION FUEL	B-2
DIESEL FUEL	B-2
HEATING FUEL	B-2
BUNKER FUEL	B-2
GROUND LUBES/HYD FLUIDS	B-2
AVIATION GASOLINE	B-1
AUTOMOTIVE GASOLINE	B-1

FISC YOKOSUKA, DET TSURUMI (HIGHEST) TESTING CAPABILITY:

AVIATION FUELS	*A*
AVIATION GASOLINE	A
DIESEL FUEL	A
AUTOMOTIVE GASOLINE	A
HEATING FUEL	A
BUNKER FUEL	A
AIRCRAFT LUBES/HYD FLUIDS	A
ENVIRONMENTAL/WASTE	A
AIRCRAFT/GROUND GREASES	B-2

APPENDIX 12

RETENTION PERIODS FOR POL SAMPLES

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RETENTION PERIODS FOR POL SAMPLES

SOURCE OF SAMPLE	SAMPLE TYPE	RETENTION PERIOD	SAMPLE QUANTITY
Tank Trucks, Tank Cars and Rail Cars	All-Levels	30 days	1 QT
	Composite	45 days	1 GL
Tankers and Barges	Line	30 days	1 GL
	All-Levels	45 days	1 QT
	Composite	90 days	5 GL
Yard Oilers	Composite	45 days	1 GL
Pipelines	Line	30 days	1 QT
	Composite	90 days	1 GL
Storage Tanks	U-M-L	30 days	1 QT
	All-Levels	45 days	1 GL
	Composite	90 days	1 GL
Packaged POL	Representative	12 months. When product is packaged in a container of less than 10 gallons (fuel and lubricating oils) or not more than 35 pounds (greases) the sample will be retained in the originally packaged container.	Sufficient sample to permit complete specification testing if required.

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APPENDIX 13

MAINTENANCE TRACKING

PART A: MAINTENANCE REQUIREMENTS CARD
PART B: MAINTENANCE INDEX PAGE
PART C: EQUIPMENT GUIDE LIST

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SYSTEM	COMPONENT Lubricated Plug Valves	MRC CODE VL-Q-2
SUBSYSTEM	RELATED MAINTENANCE VP-Q-1 VL-M-1	RATES M/H WG-6 0.4 hr.

MAINTENANCE REQUIREMENT DESCRIPTION

1. Lubricate plug valves.

SAFETY PRECAUTIONS

1. Observe standard safety precautions.
2. Ensure operation of valves will not endanger any equipment or personnel.

TOOLS, PARTS, MATERIALS, TEST EQUIPMENT

1. Valve operator handle (if it is removed)
2. Wrench
3. Grease (according to valve manufacturer's recommendations)
4. Grease gun (if applicable)

PROCEDURE

I. Stick Lubrication

1. Check to ensure valve is in full open or full closed position.
2. Remove lubricant fitting and insert proper size stick of lubricant.
3. Replace fitting; lubricant will be forced into the valve by turning the fitting.
4. Repeat, adding additional sticks of lubricant until increased resistance is felt on fitting. This indicates the lubricant system is full and under pressure.
5. Rotate valve back and forth, while turning in last stick of lubricant, to evenly spread the lubricant over the plug and body seating surfaces.
6. Always leave the fitting fully extended and full of lubricant.

II. Gun Lubrication

1. Valve should be in fully open or fully closed position.
2. Connect high pressure lubricant gun to combination lubricant fitting and pump lubricant into valve until increased resistance is felt.
3. Rotate valve back and forth during final strokes of lubricant gun to spread lubricant evenly over the plug and body seating surfaces.
4. If the valve operation, such as a worm gear operator, has grease fittings, lubricate them using lubricant gun with conventional lithium based grease.

PAGE 1 OF 1	DATE 21 MARCH 19985

PART A:
MAINTENANCE REQUIREMENT CARD

COMPONENT	REFERENCE	DATE 29 NOV 84
Valves	NAVFAC MO-230	
EQUIPMENT GUIDE LIST NO.	**MIP NO.**	
	VLV-VL	

MRC CONTROL NO.	MAINT. REQUIREMENT DESCRIPTION	PERIODICITY	SKILL LEVEL	MH	RELATED MAINT.
VL-M-1	Check valves and associated piping for leaks	M			
VL-Q-1	Check operation of check valves	Q			
VL-Q-2	Lubricate plug valves	Q	WG-6	0.4	VP-Q-1 VL-M-1
VL-Q-3	Clean and lubricate valve gear operation	Q			
VL-Q-4	Clean and grease gate valve stem	Q			
VL-Q-5	Inspect and clean flow control valves	Q			
VL-R-1	Replace valves as determined necessary by MRC W-1	R			

PART B:
MAINTENANCE INDEX PAGE

MIP NO. _____ MRC PERIODICITY _____

EQUIPMENT NAME	SERIAL NO.	LOCATION	APPLICABLE DATA PER MRC

PART C:
EQUIPMENT GUIDE LIST

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APPENDIX 14

SAMPLE DD FORM 1391s

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1. COMPONENT DLA/DFSC	FY 1993 MILITARY CONSTRUCTION PROJECT DATA	2. DATE

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
DEFENSE FUEL SUPPORT POINT (DFSP) WHEREVER, USA	RECURRING MAINTENANCE

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
Equipment Maintenance				
Electrical				
Mechanical				
Other (specified)				
Calibration				
Meters				
Gauging Systems				
Cathodic Protection Maintenance				
Grounds Maintenance				
Pipeline Pressure Testing				
Fire Protection Inspection/Maintenance				
Painting				
Safety Certifications				
Pressure Vessel Certification				
Elevator Certification				
Weight Handling Equipment Certification				
Other (specify)				

10. DESCRIPTION OF PROPOSED CONSTRUCTION:

Recurring maintenance. Perform by Contract, PWC, or fuel department labor. Work to be performed by fuel department labor will have only non-labor costs submitted to DFSC for funding.

11. JUSTIFICATION:

ADP sevice to keep software and hardware operational. Fuel terminal equipment maintenance required to minimize breakdowns. Various calibrations to ensure inventory accuracy. Cathodic protection maintenance to ensure that underground metallic structures are adequately protected. Grounds maintenance to minimize fire hazard. Pipeline pressure testing is required by 49 CFR 195. Inspection and maintenance of fire protection equipment is required by 29 CFR 1910. Cyclical painting to provide corrosion resistance. Various certifications to ensure equipment is maintained in safe operating condition.

1. COMPONENT DLA/DFSC	FY 93 MILITARY CONSTRUCTION PROJECT DATA	2. DATE 31 DEC 1992

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
CAMP SWAMPY, TX	COAT/REPAIR INTERIORS OF BULK FUEL STORAGE TANKS

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
	41110	MR1-93	2,796

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
PRIMARY FACILITY				
SEE ATTACHED COST ESTIMATE FOR DETAILS	LS	--	--	2,500
MAINTENANCE WORK	LS	--	--	(2,050)
REPAIR WORK	LS	--	--	(450)
CONTINGENCIES (5%)	--	--	--	125
SUBTOTAL	--	--	--	2,625
SIOH (6.5%)	--	--	--	171
TOTAL	--	--	--	2,796
PLANNING AND DESIGN COST (6%)	LS	--	--	(168)

10. DESCRIPTION OF PROPOSED CONSTRUCTION

Clean interior, remove and dispose of bottom sludge, sandblast interior, repair tank if necessary, and coat the interior of nineteen 50,000 BBL JP-5 and JP-8 bulk storage tanks, facility numbers 612, 629, 630, 632-637, 640, 643-645, and 648-653. Estimated replacement cost of the nineteen tanks is $28,500,000.

11. REQUIREMENT:

PROJECT: Provides clean, well coated, repaired interiors of nineteen DLA bulk fuel storage tanks used for storage of JP-5 and JP-8 fuels.

REQUIREMENT: Navy and Air Force aircraft in the immediate area require fuels support in excess of 200,000 gallons per day. Clean, uncontaminated storage is required for JP-5 and JP-8 aircraft fuels. Bulk fuel storage tanks are the primary means for providing aviation fuel logistics support for three Air Force bases and two Naval air stations in the immediate area. DFSP has the largest fuel storage capacity within a 500 mile radius, and no other means of government storage is available. Additional fuel barge deliveries allow capacity to be maintained, however, delivery costs have increased significantly.

CURRENT SITUATION: The nineteen fuel storage tanks are showing signs of severe deterioration, since they have never been coated during their 34-40 year life span. Leaks have been detected in 2 of the older tanks (tanks 629 and 630), and the newer tanks, which are of similar construction, may also be developing leaks. Tanks 629 and 630 have been taken out of service, and additional fuel barge deliveries have been necessary to maintain fuel capacity at operational needs.

IMPACT IF NOT PROVIDED: Failure to provide this project will allow bottom sediment and water in the tanks to continue to severely corrode tank bottoms, leading to product contamination, possible leaks, loss of fuel products and eventual damage to the environment.

1. COMPONENT DLA/DFSC	FY 93 MILITARY CONSTRUCTION PROJECT DATA	2. DATE 31 DEC 1992

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
CAMP SWAMPY, TX	CONSTRUCT LINER IN TANK DIKE

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
	41110	C2-93	140

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
PRIMARY FACILITY SEE ATTACHED DETAILED COST ESTIMATE FOR DETAILS	LS	--	--	125
CONTINGENCIES (5%)	--	--	--	6
SUBTOTAL	--	--	--	131
SIOH (6.5%)	--	--	--	9
TOTAL	--	--	--	140
PLANNING AND DESIGN COST (6%)	LS	--	--	(8)

10. DESCRIPTION OF PROPOSED CONSTRUCTION

Provide fabric lining to existing tank dike and basin. Apply sealant to lining and spray with polyethylene-like substance impervious to JP-4 fuel products.

11. REQUIREMENT

PROJECT: Line existing fuel tank dike and basin with fabric lining impervious to JP-4 fuel products.

REQUIREMENT: POL dikes and basins must be impermeable to fuels, and must be able to contain tank contents plus 10% in case of rupture. Existing dike is adequate, but a major spill would require costly clean-up and remediation. Impervious fabric liner would allow for easy clean-up at a minimal cost, should a spill occur. Project would allow base to comply with state spill prevention and countermeasures control (SPCC) program.

CURRENT SITUATION: Existing POL dike and basin are composed of bentonite clay, with a gravel overlayment. Spills are contained, however, complete recovery of fuel is not possible, due to the pooling of fuel beneath the gravel overlayment. In the past ten years, two spills have occurred. It is estimated that approximately 80 percent of the fuel was recovered each time. Any unrecovered fuel presents the possibility of contamination of rain water run-off, which would be in violation of our discharge permit with the state. In addition, similarly constructed berms within the fuel farm have required repairs due to severe errosion from rainwater fallout. Those berms are being repaired by installing an impervious fabric lining to prevent further errosion.

IMPACT IF NOT PROVIDED: Without impermeable containment, any rupture of tank could result in excessive loss of costly fuel, which may result in mixture of unrecovered fuel with rainwater, thereby causing groundwater contamination. Rainwater may errode the berm, thus compromising its integrity.

1. COMPONENT DLA/DFSC	FY 93 MILITARY CONSTRUCTION PROJECT DATA	2. DATE 31 DEC 1992

3. INSTALLATION AND LOCATION CAMP SWAMPY, TX	4. PROJECT TITLE REPAIR DAMAGED FUEL PIER AND DOLPHINS

5. PROGRAM ELEMENT	6. CATEGORY CODE 15140	7. PROJECT NUMBER RC5-93	8. PROJECT COST ($000) 174

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
PRIMARY FACILITY SEE ATTACHED COST ESTIMATE FOR DETAILS	LS	--	--	156
REPAIR WORK	LS	--	--	(130)
CONSTRUCTION WORK	LS	--	--	(26)
CONTINGENCIES (5%)	--	--	--	8
SUBTOTAL	--	--	--	164
SIOH (6%)	--	--	--	10
TOTAL	--	--	--	174
PLANNING AND DESIGN COST (6%)	LS	--	--	(10)

10. DESCRIPTION OF PROPOSED CONSTRUCTION

Replace 34 damaged and missing fenders on the pier fender system, and replace eight missing three-pile dolphins with seven-pile dolphins. Repair damaged concrete pier structures.

11. REQUIREMENT

PROJECT: Repair pier fender system and dolphins by replacing damaged and missing fenders and piles, and repair concrete

REQUIREMENT: DFSP supplies jet fuel and marine diesel to several installations throughout the area. Fuel is delivered to the DFSP via barge to the pier where fuel travels via pipeline from the barge to the fuel storage tanks. Structurally sound pier fender systems and dolphins are required to protect the pier and vessels during the mooring of ships alongside the pier. This pier is the only pier at DFSP designed for discharging and loading of ocean-going petroleum tankers. The alternative to replace the pier has been considered, and is determined to have twice the net present value to repair the pier, since the pier only requires replacement of the damaged fenders and dolphins. Replacement of the three-pile dolphins with seven-pile dolphins is necessary, since the three-pile dolphins have been destroyed because they are not sufficient for their intended purpose, and are not able to meet the requirements of the larger ocean-going vessels.

CURRENT SITUATION: Pier fender systems, dolphins and concrete structures on the fuel pier were heavily damaged when a Navy tanker collided to the fuel pier during a recent mooring operation. The remaining fender systems are presently being used for mooring tankers along the fuel pier, but are not expected to last without protection of the dolphins.

IMPACT IF NOT PROVIDED: Fuel barges and tankers will continue to deliver fuel to a pier that may be structurally unsound. Further deliveries of fuel to the pier may cause additional damage to the fender systems and pier structures. DFSP's ability to load and discharge tankers carrying DLA bulk fuel products will be seriously disrupted if the pier is damaged beyond use, thereby hampering DFSP's fuel distribution mission.

1. COMPONENT DLA/DFSC	FY 93 MILITARY CONSTRUCTION PROJECT DATA	2. DATE 31 DEC 1992

3. INSTALLATION AND LOCATION CAMP SWAMPY, TX	4. PROJECT TITLE REPAIR BULK FUEL PIPELINE

5. PROGRAM ELEMENT	6. CATEGORY CODE 12510	7. PROJECT NUMBER RC4-93	8. PROJECT COST ($000) 2,963

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
PRIMARY FACILITY FROM COST ESTIMATE FORM NAVFAC 11013/7 (ENCL)	LS	--	--	2,650
REPAIR WORK	LS	--	--	(2,500)
CONSTRUCTION WORK	LS	--	--	(150)
CONTINGENCIES (5%)	--	--	--	133
SUBTOTAL	--	--	--	2,783
SIOH (6.5%)	--	--	--	181
TOTAL	--	--	--	2,963
PLANNING AND DESIGN COST (6%)	LS	--	--	(178)

10. DESCRIPTION OF PROPOSED CONSTRUCTION

Replace 6000 linear meters of the existing 6500 linear meter 10" pipeline with 10" steel pipe, add leak detection monitoring and cathodic protection along the pipeline. Install pig launching and receiving stations and close the existing 6000 LM pipeline in accordance with EPA and state regulations. Replacement cost of the pipeline is $6,550,000.

11. REQUIREMENT

PROJECT: Replace various pumps and the majority of existing fuel pipeline used to transfer bulk fuels from the pier to the bulk storage tanks. Install leak detection, cathodic protection and provide pig launching and receiving stations.

REQUIREMENT: DFSP supplies jet fuel and marine diesel to several installations throughout the area. Transportation is required to bring the fuel onto the DFSP, and to issue the fuel to the installations. This pipeline provides a means to transport the fuel to the DFSP. Alternatives of repairing only the corroded sections of pipeline vs. replacement of the entire pipeline were reviewed, and it was determined that although the initial cost of repair would be less costly than entire replacement, due to the advanced corrosion of the pipeline, extensive repairs would be required every three years. Consequently, the total present value cost of the repairs would exceed the total present value of replacement within six years. Another alternative includes delivery via railcar to a truck loading facility, thus tripling transportation costs, due to additional railcar deliveries and extensive truck traffic from the loading facility to the unloading facility near the bulk tanks. In addition, the truck loading facility will require some modification, if it is to be used to the required capacity. Thus, the total present value of delivery via railcar and truck exceeds the present value of delivery via replaced pipeline within four years.

CURRENT SITUATION: The existing 47 year old pipeline developed two new leaks during January 1993. These leaks occurred in the wall of the pipe, not at a joint or weld, and are the result of generalized corrosion from the outside of the pipe. "Intelligent pig" testing was done on the pipeline, and it was determined that potential for 25-30 more leaks exist throughout the pipeline. Deterioration has reached the point that the Commanding General has ordered the pipeline to be emptied until permanent repairs can be made because of the liability for environmental contamination and fire. Temporary means of transporting fuel have been delivery via railcar to a truck loading facility, and then delivery to truck unloading facility near the bulk fuel storage tanks.

IMPACT IF NOT PROVIDED: Further incidents of leakage will cause ground water contamination and danger of disastrous fire. Long shutdowns of the pipeline will force DFSC to rely solely on railcar deliveries of fuel, at a much greater cost, and will leave the air station in a vulnerable position if railcar deliveries are interrupted for any reason.

1. COMPONENT DLA/DFSC	FY 93 MILITARY CONSTRUCTION PROJECT DATA	2. DATE 31 DEC 1992

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
CAMP SWAMPY, TX	REPAIR TRUCK LOADING PLATFORM AND PARKING LOT

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
	12630	RMC6-93	234

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
PRIMARY FACILITY SEE ATTACHED COST ESTIMATE FOR DETAILS	LS	--	--	210
REPAIR WORK	LS	--	--	(124)
MAINTENANCE WORK	LS	--	--	(50)
CONSTRUCTION WORK	LS	--	--	(36)
CONTINGENCIES (5%)	--	--	--	11
SUBTOTAL	--	--	--	221
SIOH (6%)	--	--	--	13
TOTAL	--	--	--	234
PLANNING AND DESIGN COST (6%)	--	--	--	(14)

10. DESCRIPTION OF PROPOSED CONSTRUCTION

Repair pump, piping, valves, fittings, electrical systems and lighting, relaxation/fuel flow surge control tanks, and provide corrosion control of the entire steel structure of the truck loading rack. Install temperature compensating fuel flow metering, leak detection systems and cathodic protection. Provide subgrade repairs to parking lot and repave with concrete.

11. REQUIREMENT

PROJECT: Provide various repairs and corrosion control to truck loading rack. Provide fuel flow metering, leak detection and cathodic protection to loading rack. Provide subgrade repairs and repave parking lot.

REQUIREMENT: DFSP supplies jet fuel and marine diesel to several installations throughout the area. Navy and Air Force aircraft at DFSP require fuels support in excess of 200,000 gallons per day. The primary means of providing fuel to the aircraft is via the refueling trucks, which are loaded via the truck loading rack. The hydrant system provides a a secondary means of fueling aircraft (approximately 40%), however, the use of the hydrant system has reached maximum capacity. No other means of fueling aircraft at the DFSP is available. In addition, the nine refueling trucks require adequate space for parking, when they are not in use, that will not contribute to foreign object damage (FOD) to aircraft.

CURRENT SITUATION: The existing facility structure has been damaged in various places due to occasional bumping by refueling trucks during fuel loading operations. Pump, piping, valves and fittings have experienced excessive wear and tear during their 30-year life, and require repair or replacements. Electrical systems and lighting are often down due to overload of the system, when all five pump stations are being used. The asphalt pavement is alligatored with numerous potholes, and there are large areas where the subgrade is exposed. Refueler trucks are experiencing stress cracking in the tanks due to the unlevel parking surface. Loose pavement causes potential for foreign object damage to aircraft due to loose impediments being drawn into the aircraft engines.

IMPACT IF NOT PROVIDED: The truck loading rack structure will continue to deteriorate, and the pump, piping, valves and fittings will eventually fail. The refueler trucks will continue to incur stress cracking and damages to the tanks due to contortion of the trucks from potholes throughout the parking area. Aircraft and human safety will continue to be jeopardized due to potential for aircraft foreign object damage from loose impediments being dragged to the aircraft apron from the truck loading rack by the refueler trucks.

APPENDIX 15

MAINTENANCE DISCREPANCY CARD

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MRC NO.: LA-M-1

EQUIPMENT NAME: Loading Arm

SERIAL NUMBER: J8-10B

MANUFACTURER: Acme

PROBLEMS/COMMENTS: The shut-off valve between the pier pipe and the arm is leaking. The arm was found filled with fuel. (For safety reasons, loading arms are drained after every fueling operation.) Twenty-four hours after the arm was drained, approximately 20 gallons of fuel had re-entered the arm. The valve needs to be repaired or replaced.

Lieu Sen Fong — **SUBMITTED BY**

9 Dec 94 — **DATE**

(After evaluation or job completion)

MANHOURS SPENT: 36

PERFORMED BY: Fuel Maintenance

MAINTENANCE DEFERRED TO:

REASON FOR DEFER: No spare valve in inventory to replace the leaky valve. After the valve was removed from the pier pipe and blind flange installed on the pipe, the valve was examined. Based on damages observed inside the valve cavity, the valve cannot be repaired.

James Morrow — **SUPERVISOR SIGNATURE**

11 Dec 94 — **DATE**

MAINTENANCE DISCREPANCY CARD

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APPENDIX 16

TYPICAL TANK HISTORY RECORDS

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TANK HISTORY RECORD

TECHNICAL INFORMATION

TANK NUMBER: ST-32 **LOCATION:** Tenjo Vista

YEAR CONSTRUCTED: 1954 **TYPE OF CONSTRUCTION:** Wd. Steel

SHELL CAPACITY: 2,100 BBL **SAFE CAPACITY:** 2,000 BBL

HEIGHT: 15 FT 8 IN **DIAMETER:** 23 FT 4 IN

PRODUCT CHANGE RECORD

DATE: 9 December 1994 **FROM:** Waste Oil **TO:** F-76

REMARKS: Temporary conversion for storing F-76 from Tank C-1.

DATE: _____ **FROM:** _____ **TO:** _____

REMARKS: _____

DATE: _____ **FROM:** _____ **TO:** _____

REMARKS: _____

DATE: _____ **FROM:** _____ **TO:** _____

REMARKS: _____

COATING TYPE: Polyurethane (NFGS-09872) **DATE COATED:** 6 June 1988

COATING TYPE: _____ **DATE COATED:** _____

COATING TYPE: _____ **DATE COATED:** _____

COATING TYPE: _____ **DATE COATED:** _____

CATHODIC PROTECTION INFORMATION: Acme rectifier at Station 2. The rectifier was installed in 1980.

OTHER INFORMATION: Pin hole leak was found on tank bottom in 1987. Tank was cleaned and a patch welded over the hole by PWC.

TANK CLEANING RECORD

TANK NUMBER: ST-32

DATE: 12 April 1987

REASON FOR CLEANING: To repair leaky tank bottom.

CONDITION FOUND: Uniform rust throughout the tank interior. After tank was cleaned, a pin hole was found on tank bottom near tank wall manhole.

ACTION PERFORMED: Pin hole area sandblasted clean and an 8" square patch was welded over the hole by PWC.

DATE: 20 February 1988

REASON FOR CLEANING: Tank bottom coating project.

CONDITION FOUND: Removed half barrel of sludge. Uniform rust found throughout the tank interior. The tank patch repaired in 1987 appeared in good condition. Tank cleaned by contractor as a part of the tank bottom coating project.

ACTION PERFORMED: Tank bottom and wall 18" up above tank bottom were sand blasted and coated with polyurethane coating system per NFGS-09872).

DATE: 9 December 1994

REASON FOR CLEANING: Converting from waste oil to F-76

CONDITION FOUND: Removed three barrels of sludge. Tank liner appeared in a good condition, without any sign of peeling or racking. Other than the normal surface rust on the non-lined portion of the tank wall, no significant deep pits were found.

ACTION PERFORMED: Tank cleaned by flushing the entire tank interior with pressurized water. After tank dried, tank interior was visually inspected and tank plates thickness measured using an ultrasonic tester. Measuring results recorded.

APPENDIX 17

NAVAL FACILITIES ENGINEERING COMMAND
ENGINEERING FIELD DIVISIONS (EFDs)

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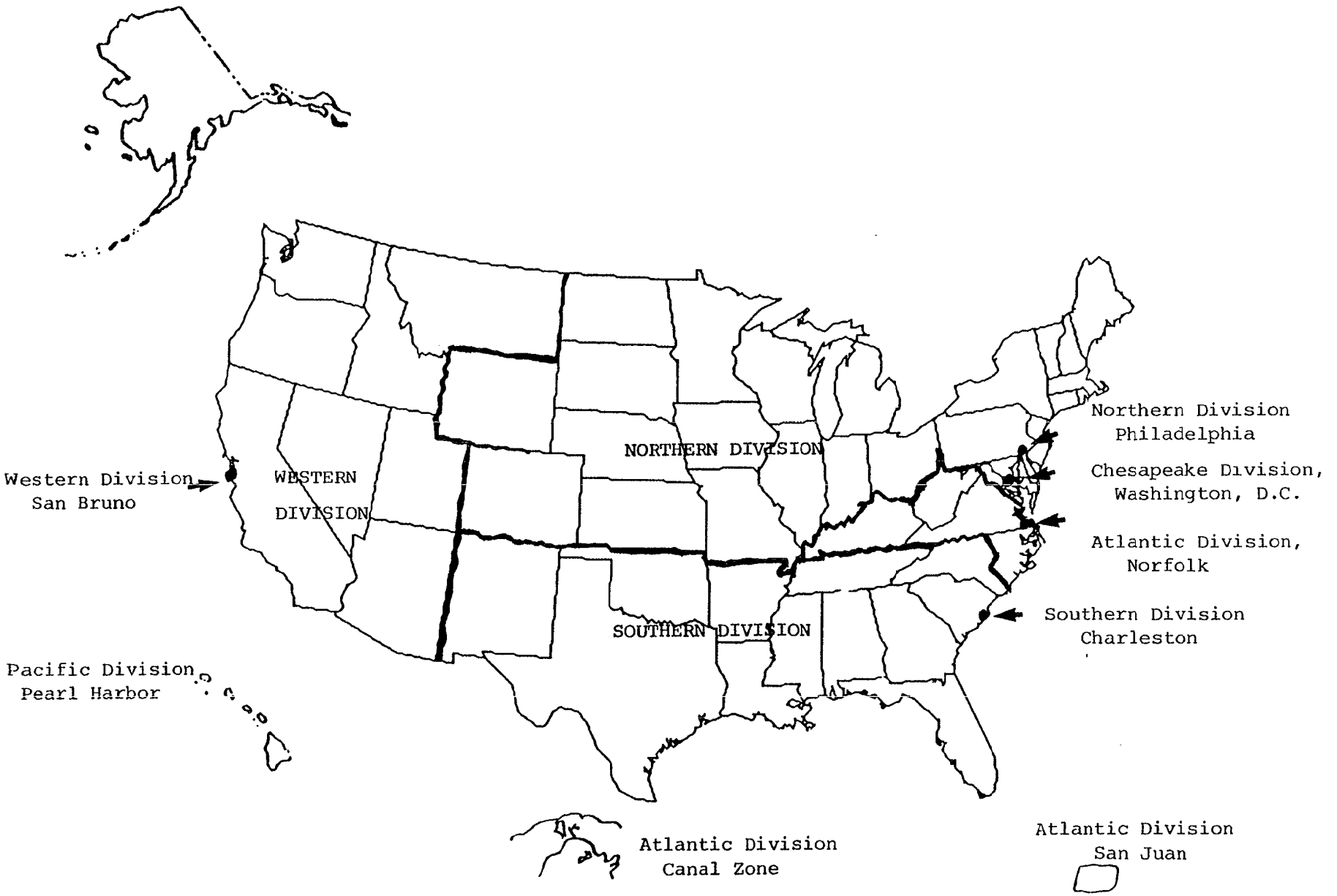
NAVAL FACILITIES ENGINEERING COMMAND ENGINEERING FIELD DIVISIONS (EFDs)

ADDRESS	TELEPHONE (COMMERCIAL/DSN)
Northern Division (Code 114) Naval Facilities Engineering Command Philadelphia, PA 19112-5000	(215) 755-6280/443-6280
Chesapeake Division (Code 114) Naval Facilities Engineering Command Bldg. 212, Washington Navy Yard Washington, DC 20374-5000	(202) 433-3760/288-3760
Atlantic Division (Code 114) Naval Facilities Engineering Command Norfolk, VA 23511-5000	(804) 444-9556/564-9556
Southern Division (Code 114) Naval Facilities Engineering Command P.O. Box 10068 Charleston, SC 29411-5000	(803) 743-5510/794-5510
Southwestern Division (Code 09E) Naval Facilities Engineering Command San Diego, CA 92132-5190	(619) 532-3825/522-3825
Western Division (Code 114) Naval Facilities Engineering Command P.O. Box 727 San Bruno, CA 94066-5000	(415) 877-7498/859-7498
Pacific Division (Code 114) Naval Facilities Engineering Command Pearl Harbor, HI 96860-5000	(808) 471-3948/471-3948
Naval Facilities Engineering Service Center (Code 422) 560 Center Dr. Port Hueneme, CA 93043-4328	(805) 982-4846/551-4846

ENGINEERING FIELD DIVISIONS, NAVAL FACILITIES ENGINEERING COMMAND



APPENDIX 18

GUIDANCE TO NEW EPA REGULATIONS ON HAZARDOUS WASTE FUELS AND USED OIL FUELS

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GUIDE TO NEW EPA REGULATIONS ON HAZARDOUS WASTE FUELS AND USED OIL FUELS

1. INTRODUCTION

This guide summarizes the final EPA regulations (enclosure (1)) on the management of hazardous waste fuel and used oil fuel burned for energy recovery and discusses their impact on Navy activities. The regulations are very complex. This guide clarifies the functions subject to the regulations and Navy installation actions necessary for compliance.

2. DISCUSSION

Generally, the purpose of the regulations is to halt the burning of fuels that have hazardous constituents in boilers that could emit these constituents to the air. Three categories of fuel are defined in the regulations:

a. Hazardous waste fuels
b. Specification used oil fuels
c. Off-specification used oil fuels

The regulations have been boiled down to the chart provided in paragraph 6. In order to understand the chart, you must carefully read paragraphs 3 and 4 to see if the materials you handle are affected by the new regulations. If so, use the Regulatory Responsibility Chart (paragraph 6) to see what actions, if any, you must take.

3. DEFINITION OF TERMS

a. Used Oil. Any oil that has been refined from crude oil, used, and as a result of such use, is contaminated by physical or chemical impurities. Wastes that contain oils that have not been used (e.g., fuel oil storage tank bottom clean-out wastes) are not used oil unless they are mixed with used oil.

Fuels:

b. Hazardous Waste Fuel. Two criteria must be met for something to be considered a hazardous waste fuel:

(1) The waste is a hazardous waste because it is listed in, or meets the general criteria in, 40 CFR 261, and

(2) The waste is burned to recover its energy content; it is not incinerated.

Some samples of hazardous waste fuels are:

- A fuel produced by mixing a RCRA hazardous waste with virgin or used oil fuel stocks.

- A fuel containing used oil where the fuel has a total halogen content between 1,000 ppm and 4,000 ppm and no proof is given that the halogens are not in the form of hazardous halogenated waste such as methylene chloride or trichloroethane.

- A fuel containing used oil that is contaminated with PCBs.

c. Off Specification Used Oil Fuels. Any used oil fuel that is hazardous solely because it exceeds any of the allowable levels listed in Table 1, below. These fuels are treated differently from hazardous waste fuels in that they can be blended with clean fuels to upgrade them to specification used oil fuels. Used oil is assumed to be off specification unless demonstrated otherwise.

Table 1
Used Oil Fuel Specifications:

Constituent/property	Allowable Level
Arsenic	5 ppm maximum
Cadmium	2 ppm maximum
Chromium	10 ppm maximum
Lead	100 ppm maximum
Flash Point	No less than 100ºF
Total Halogens	4,000 ppm maximum

Some examples of off specification used oil fuels are:

- Used motor oil with a lead content above 100 ppm.

- Used oil with a flash point less than 100°F (perhaps with gasoline).

- Used oil with a total halogen content in excess of 4,000 ppm for which proof is given the halogens are not in the form of a halogenated hazardous waste such as methylene chloride or trichloroethane.

d. Specification Used Oil Fuels. Used oil fuels that do not exceed any allowable level in Table 1 and contain no added hazardous waste. You may upgrade off specification used fuels to this category by blending with other fuels.

NOTE: Navy specifications for Fuel Oil Reclaimed (FOR) (MIL-F-24951(SA)) have been revised to include EPA used fuel oil specifications.

- Used motor oil with a lead content below 100 ppm.

- Used oil with a total halogen content less than 1,000 ppm.

- Used oil with a total halogen content between 1,000 ppm and 4,000 ppm for which proof is given that the halogens are not in the form of a halogenated hazardous waste such as methylene chloride or trichloroethane.

e. Exempt Materials. Some materials are exempt from this regulation because they fit into none of the above categories. Examples are:

- Recovered fuels that may be contaminated (but not with used oil or solvents) but have not actually been used. For example, JP4 and JP5 jet fuel and DF2 diesel fuel that have been removed from a vehicles tank so the vehicle can be serviced are contaminated by definition and Navy regulations may forbid their reuse as a vehicle fuel.

- Used oil that is recycled by some method other than burning, unless hazardous waste has been mixed in.

- Used oil used in firefighting training.

- Used oil that may contain hazardous waste that is burned in a device which has qualified under 40 CFR 264 or 265 as an incinerator. *

- Used oil that may contain hazardous wastes managed by a method other than burning. *

* These materials and practices are already regulated under 40 CFR 262-265 and 270.

4. MANAGEMENT CATEGORIES

a. Small Quantity Generator. An installation that generates less than 1,000 Kg (2,200 lb.) of used oil or hazardous waste or less than the quantities of "acutely hazardous wastes" defined in 40 CFR 261.5, in any one month period.

An example of a small quantity generator is an auto service garage that generates less than 1,000 Kg (2,200 lb.) of used motor oils during any one month.

b. Generator. An installation that generates more than 1,000 Kg (2,200 lb.) of used oil or hazardous waste or more than the quantities of "acutely hazardous wastes" defined in 40 CFR 261.5, in any one month period.

c. Transporter. One who transports hazardous waste or used oil fuels off-site. The definition for "on-site" from RCRA is "the same or geographically contiguous property which may be divided by public or private right of way, provided the entrance and exit between the properties is at a crossroads intersection, and access is provided by crossing as opposed to going along, the right of way. Noncontiguous properties owned by the same person but connected by a right of way which he controls and to which the public does not have access is also considered on-site property." 40 CFR 260.10.

An example of a transporter is:

- A Navy owned tank truck or a contractor that picks up used oil from an installation's holding tanks and must travel along a public right of way before emptying, even if it empties at another Naval installation.

d. Burner. One who burns any quantity of hazardous waste fuel or used oil fuel for energy recovery.

NOTE: Three categories of burners are specifically exempted from these regulations:

- Marine and diesel engines may burn specification and off specification used oil fuels, provided it has not been mixed with a hazardous waste, without being regulated.

- Specification and off specification used oil fuel may be burned in space heaters provided the heater is vented outdoors and only oil that was generated in site or received from do-it-yourself oil changers is used.

e. Industrial Boiler. A boiler located on the site of a facility engaged in a manufacturing process where substances are transformed into new products, including the component parts of products, by mechanical or chemical processes.

f. Utility Boiler. A boiler that is used to produce electricity, steam or heated or cooled air for sale.

g. Nonindustrial Boiler. Anything that is not an industrial or a utility boiler.

h. Industrial Furnace. Any of the following enclosed devices that are integral components of manufacturing processes and that use controlled flame combustion to accomplish recovery of materials or energy: cement kilns, lime kilns, aggregate kilns (including asphalt kilns), phosphate kilns, coke ovens, blast furnaces, smelting furnaces, refining furnaces, titanium dioxide chloride process oxidation reactors, and methane reforming furnaces (and other devices as the Administrator may add to this list).

i. Marketer. One who sells hazardous waste fuel to a burner. The Office of the Secretary of Defense, after coordination with the Environmental Protection Agency, has advised that DOD installations are not "marketers" if used oil fuel or hazardous waste fuel is transferred (regardless of transfer "credits" or other accounting procedures) within the Department of Defense. It should be noted that Defense Reutilization and Marketing Offices (DRMOs) are "marketers" if they sell used oil fuel or hazardous waste fuel outside of the DOD.

5. USE OF REGULATORY RESPONSIBILITY CHART:

Look at the column under each management category that describes what you do. As you go down the column, each entry indicates, for the fuel type in parentheses, the action in that row that must be taken to comply. The letter appearing after the parentheses indicates a footnote on the following page which you should check for exemptions and an explanation. The numbers after the parentheses indicates the section number of the new regulations in enclosure (1). Read these when indicated for a more detailed explanation of what to do.

For example, look at the column under nonindustrial boilers. In the first box down, you find the letters H and O in parentheses for hazardous waste fuel and off specification fuels. The row says to stop burning these two types of fuel. Next, look at footnote B since it appears next to the parentheses. It tells you that certain burners (space heaters and marine and diesel engines) are exempt from the regulations. You may continue to burn off specification fuels in these types of burners. Finally, the number written to the right (266.31 in this case), directs you to the text of the new regulations (enclosure (1)) for reference.

Since the letter S for specification fuel does not appear in this box, you may continue to burn it in any nonindustrial burner.

Continue down the column in a similar fashion to see if any of the other actions must be taken.

FOOTNOTES

A. The used oil fuel must be tested, or otherwise proven to meet specification used oil fuel standards. The testing (or other proof) may be by the burner or the Navy activity that supplied the used oil fuel.

- Either the supplier of the specification used oil fuel, or the burner, must notify EPA or the authorized state that the fuel meets specifications (Enclosure (1), page 49195). Whoever notifies EPA must keep the records of analysis of

other proof for three years. (Enclosure (1), Section 266.43b(6)).

B. There are some nonindustrial burners that are exempt from the regulations:

1. Used oil space heaters burning specification and off specification used oil fuel (Enclosure (1), 266.41).

2. Marine and diesel engines burning specification and off specification used oil fuel.

C. Hazardous waste fuel shipments must be physically accompanied by a manifest. Off specification used oil fuel shippers must prepare and send an invoice that need not accompany the shipment. These documents should record any hazardous or off specification constituents. Burners and marketers must keep copies of these documents. All documents must be kept on file for 3 years.

D. Generators of hazardous waste fuel who do not store their hazardous waste fuel more than 90 days are not subject to the full storage requirements even if they are burners. They must comply with reduced storage requirements listed in 40 CFR 262.34.

APPENDIX 19

NAVY OHS POLLUTION RESPONSE ORGANIZATION

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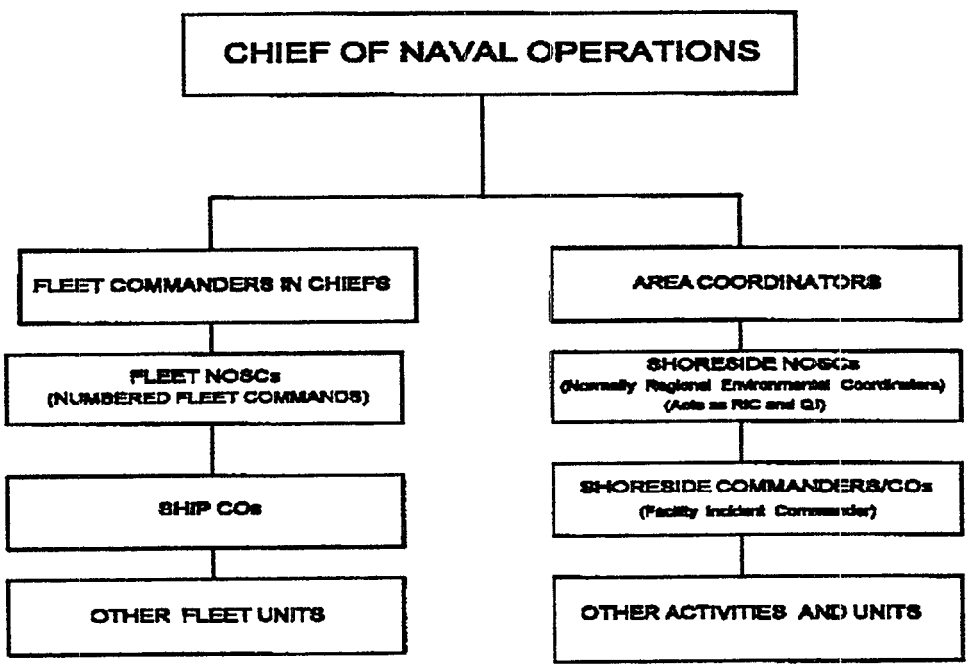

NAVY OHS POLLUTION RESPONSE ORGANIZATION

FIGURE 10.2

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APPENDIX 20

OIL SPILL MESSAGE FORMAT

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APPENDIX 20

OIL SPILL REPORT (MESSAGE FORMAT)

1. **Precedence.** Oil spill messages will normally be by routine precedence provided prior telephone report has been made; if not, use priority precedence.

2. **Classification or Special Handling Marking.** Spill reports are unclassified and do not warrant special handling markings unless classified or sensitive unclassified information must be incorporated. Inclusion of such information should be avoided to the maximum extent possible to permit such reports to be handled on a solely unclassified basis.

3. **Addressee and info blocks** for oil spills to waters of the Unites States and its contiguous zone:

FM: Navy Activity (Spiller)

TO: NOSC/NOSCDR (see Chapter 11 or 17)

Operational Commander

INFO: CNO WASHINGTON DC//N45//

COMNAVSEASYSCOM WASHINGTON DC//00C//

NFESC PORT HUENEME CA//112//

NAVPETOFF ALEXANDRIA VA//NPO//

COGARD NATIONAL RESPONSE CENTER WASHINGTON DC//JJJ//

NOTE: IF ACTIVITY IS A DEFENSE FUEL SUPPORT POINT (DFSP) AND FUEL SPILLED BELONGS TO DLA/DFSC, MESSAGE INFO BLOCK SHOULD INCLUDE THE FOLLOWING ADDEES: DFSC CAMERON STA VA AND DFR (COGNIZANT REGION)

4. **Addressee and info blocks** for oil spills to waters of foreign countries:

FM: Navy Activity (Spiller)

TO: NOSC/NOSCDR (see Chapter 11 or 17)

Operational Commander

INFO: CNO WASHINGTON DC//N45//

NFESC PORT HUENEME CA//112//

NAVPETOFF ALEXANDRIA VA//NPO//

DFSC CAMERON STA VA//

DFR (COGNIZANT REGION)//

COMNAVSEASYSCOM WASHINGTON DC//00C//

NOTE: IF ACTIVITY IS A DEFENSE FUEL SUPPORT POINT (DFSP) AND FUEL SPILLED BELONGS TO DLA/DFSC, MESSAGE INFO BLOCK SHOULD INCLUDE THE FOLLOWING ADDEES: DFSC CAMERON STA VA AND DFR (COGNIZANT REGION)

5. **Body of Report for all oil spills.** The body of the message will be in the following format:

UNCLAS//NO5090//

SUBJ: OIL SPILL REPORT (REPORT SYMBOL OPNAV 5090-2) (MIN: CONSIDERED)

MSGID/GENADMIN/ORIGINATOR//

RMKS/

1. GMT DTG RELEASE OCCURRED/DISCOVERED.

2. ACTIVITY/ORIGINATING RELEASE: (list name, UIC; for non-Navy spills discovered by Navy activity, list name of responsible party; (if from commercial firm under contract to Navy: list names of firm and contracting activity); for spills from unknown source, indicate whether spill is thought to have originated from Navy operations).

3. SPILL LOCATION: list specific location within activity (building or area designation, etc.).

4. AMOUNT SPILLED IN GALLONS: (best estimate; if oil/water mixture, indicate percentage oil).

5. TYPE OF OIL SPILLED: (choose one: diesel fuel marine (DFM); naval distillate; jet fuels (JP-8, JP-5); aviation/automotive gasoline; automotive diesel; heating fuels (grades 1 and 2, kerosene); residual burner fuel (grades 4, 5, and 6/bunker C); lube/hydraulic oils; oil/oil mixture (including slop and waste oils); oil/water mixture (including bilge waste); Other (specify); unknown (provide best estimate, if possible)).

6. OPERATION UNDERWAY WHEN SPILL OCCURRED: (choose one: fueling/defueling; internal transfer of fuel (includes transport of fuel from one storage area to another); bilge dewatering (including donut operations); salvage; other (specify); unknown).

7. SPILL CAUSE: (provide narrative description of specific spill cause; indicate if one of the following was principal

cause: structural failure (specify); hose failure or leak; other type equipment failure (specify); valve misalignment; monitoring error; other procedural/communications error (specify); other (specify); unknown).

8. SLICK DESCRIPTION AND MOVEMENT: (size: length and width; color (choose one): barely visible, silvery, faint color, bright color bands, dull brown, or dark brown; on-scene wind: direction, speed; sea state; slick movement: direction, speed).

9. AREAS DAMAGED OR THREATENED: (name of body of water affected; nature and extent of damage to property, wildlife, or other resources (if any); areas or resources threatened).

10. TELEPHONIC REPORT TO NATIONAL RESPONSE CENTER (NRC) WAS/WAS NOT MADE. (If made, report number and person receiving report).

11. SAMPLES WERE/WERE NOT TAKEN.

12. CONTAINMENT METHOD PLANNED/USED: (if none, state reason; indicate which of the following equipment utilized: boom; ship's hull; camel; water spray; chemical agent (specify); other (specify)).

13. SPILL REMOVAL METHOD PLANNED/USED: (if none, state reason; indicate which of the following equipment utilized: DIP 1002 skimmer; DIP 3002 skimmer; SLURP skimmer; sorbents (oil-absorbing pads, chips, or other materials); dispersants; vacuum trucks/ pumps; other (specify)).

14. PARTIES PERFORMING SPILL REMOVAL: (indicate one or more of the following: Navy (specify lead organization in charge); commercial firm under contract to Navy; USCG; EPA; state or local agency; other (specify)).

15. ASSISTANCE REQUIRED/ADDITIONAL COMMENTS. State whether this is a final report or if there will be follow up reports.

16. ACTIVITY CONTACT FOR ADDITIONAL INFORMATION: (name, code, DSN and/or commercial).

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APPENDIX 21

OIL SPILL LOCKER INVENTORY

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TABLE ERAP F.5 ON-SITE INVENTORY: SORBENTS (STOCKPILED)

STOCKPILED ITEM	NATIONAL STOCK NUMBER	STOCKPILE LOCATION	PURCHASE UNIT	SORPTION CAPACITY (gal/unit)	STOCK ON HAND (units)	STOCKING GOAL (units)
Sorbent Boom (white)	9330-01-281-0337		60-ft package	?		
Sorbent Boom (green)	9330-01-334-5036		60-ft package	?		
Sorbent Pad (34x38")	9330-01-336-5074		bale	?		
Sorbent Pad (17x19")	9330-01-219-7414		bale	?		
Sorbent Pillow	open purchase		bale	?		

TOTAL SORPTION CAPACITY ON HAND (GAL):

POINT OF CONTACT: DAY PHONE: 24-HOUR PHONE:

COMMENTS:

Given sorption capacities per purchase unit and number of units on hand, this table has Math capability to calculate the total sorption capacity on hand.
Purchase of expendibles is on-going; stocks are replenished as needed, so year of purchase information is unavailable.

Last updated: Month 19xx

TABLE ERAP F.6 ON-SITE INVENTORY: TOOLS AND SUPPLIES (STOCKPILED)

STOCKPILED ITEM	NATIONAL STOCK NUMBER	STOCKPILE LOCATION	UNIT	STOCKING GOAL (units)	STOCK ON HAND (units)
Rope, 3/8" Nylon	4020-00-946-0436		roll		
Rope, 1/2" Nylon	4020-00-106-9361		roll		
Rope, 3/4" Nylon	4020-00-141-7152		roll		
Rope, 3/8" Manila	4020-00-834-0708		coil		
Rope, 1/2" Manila	4020-00-238-7732		coil		
Rope, 3/4" Manila	4020-00-238-7734		coil		
Parachute Cord	4020-00-246-0688		sl		
Shovel, Sq Nose (Long)	5120-00-293-3330		each		
Shovel, Sq Nose (Short)	5120-00-224-9326		each		
Shovel, Rd Nose (Long)	5120-00-188-8450		each		
Shovel, Rd Nose (Short)	5120-00-293-3336		each		
Mop Squeezer	7920-00-170-5449		each		
Mop, Cotton	7920-00-224-8726		each		
Squeegee	?		each		
Can, Garbage (30-gal)	7240-00-160-0440		each		
Rags	7920-00-223-1014		50 lb bale		
Pail, Plastic (3-gal)	7240-00-246-1097		each		
Pail, Plastic (5-gal)	7240-00-943-7105		each		
Bags, Sand	8105-00-965-2509		bale		
Gloves, Rubber	8415-00-935-2833		pair		
Goggles, Plastic	8465-01-004-2893		pair		
Bags, Plastic (large)	8105-01-183-9768		box		

POINT OF CONTACT: DAY PHONE: 24-HOUR PHONE:

COMMENTS:

Purchase of tools and supplies is on-going; stocks are replenished as needed, so year of purchase information is unavailable.

Last updated: Month 199x

APPENDIX 22

OIL SPILL EQUIPMENT

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OIL SPILL EQUIPMENT

LARGE SKIMMERS (DIP3001) are self-contained 26-foot-long vessels. Each system includes onboard recovered oil storage of 1500 gallons and an offloading pump for oil transfer to a shoreside treatment or disposal site. The skimmers are self-propelled, manned by a crew of two, and designed to clean up oil spills on inland waters and harbors. The units can operate in waves up to 3 feet high. Some skimmer systems also include a powered debris basket, a crane for removal of debris and a macerator/grinder for processing the debris.

The **BOOM PLATFORM** is a twin-hulled or tri-hulled craft powered by two 85-horsepower outboard engines. The platforms transport and deploy oil spill control equipment in harbors and inland waterways. The platform deck is equipped with an operator console, guardrails and below-deck storage space. The craft is capable of operating safely in 3-foot waves, 2-knot currents and 20-knot winds.

BOOM SYSTEMS CLASS I and II are oil barriers that normally are stored out of the water in a protective enclosure. They are usually deployed only after an oil spill has occurred or during fueling operations. They also may be referred to as deployable boom. A boom system consists of an above-water freeboard, a below-water skirt, attached floats, ballast and tension-carrying members. A Class I boom is 17-1/2 inches overall with 7-1/2 inches freeboard, whereas a Class II boom is 28 inches overall with 12 inches freeboard. For inventory applications, all booms have been incorporated into a system concept. Each system consists of 500 linear feet of boom (ten 50-foot lengths). All boom requirements are to be expressed in boom systems in lieu of linear feet.

PERMANENT BOOM is used for extended deployment periods and remains positioned in the water. They are used primarily in high spill risk areas that experience a low ship operating tempo. Fueling piers and carrier berths are examples of potential permanent boom sites.

BOOM MOORING SYSTEM is used to moor deployable boom in open water. For the system to be effective, the following conditions must apply: 1) water less than 100 feet deep; 2) sandy bottom; 3) current less than one knot; and 4) wind under 25 knots. Each system contains various mooring lines, a 75-pound anchor, 12 feet of chain link, a spring buoy (500-pound buoyancy rated) and a crown buoy (100-pound buoyancy rated).

UTILITY BOATS are used to tow oil containment boom to the spill site. The 19- to 24-foot boats are trailer mounted and have a multiple "vee" fiberglass hull. Each boat is equipped with a Sampson Towing Post rated at 6,000 pounds static pull. Each post is fitted with an expanded metal safety screen. The boats are generally powered by 85-horsepower and 150 horsepower outboard engines with remote controls located on an operator's console. Engines are normally procured separately from the utility boats.

VACUUM TRUCKS. Special heavy duty trucks designed to pick up oil on water or land. They are equipped with a self-contained weir system and a storage tank capacity of 2200 gallons. They can easily pick up oil near the shore or around pier pilings.

RADIO RESPONSE SKIMMERS. Are currently under design with initial tests to be completed by the end of 1995 and production by March 1996. Initial contract for 29 units with a target completion of 70 units. The rapid response skimmer will eventually replace all of the DIP 3001 skimmers. These units are much lighter and come with trailers. The units have a maximum speed of 15 kts and internal storage capacity of 1000 gallons. They will also carry an additional 1000 gallon floatable bladder.

APPENDIX 23

AIRCRAFT REFUELER DRIVER TRAINING

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Aircraft Refueler Driver Training

1. **PURPOSE**. To establish standard procedures to insure that all aircraft and industrial drivers are trained and licensed to operate aviation refuelers and defuelers at NAS Adak.

2. **PERSONNEL**.

   a. Candidate operator.

   b. Licensed operator.

   c. Fuels Division Training Petty Officer (TPO).

   d. Fuels Division Leading Chief Petty Officer (LCPO).

   e. Fuels Management Officer (FMO).

3. **INITIAL TRAINING**. A candidate operator must possess a valid state drivers license. A candidate operator must complete both indoctrination and qualification training under the supervision of a licensed driving instructor prior to receiving a U.S. Government motor vehicle operator identification card. A copy of the driver qualification checkoff sheet will be placed in the training jacket of each candidate operator. It will be used to document progress towards qualification. The qualification training is comprised of the following:

   a. Indoctrination training.

   (1) The candidate operator will learn the operations of the mobile refueler and defueler.

   (2) The candidate operator will ride with a qualified licensed driver for a two week time period.

   (3) The candidate operator will complete the following fundamentals and systems PQS for Fuel Operations Ashore:

      (a) NAVEDTRA 43288-307 (Refueling Operator)

      (b) NAVEDTRA 43288-308 (Defueling Operator)

      (c) NAVEDTRA 43288-309 (Ground Fuels Operator)

      (d) NAVEDTRA 43288-310 (Direct Refueling Operator)

   (3) Upon completion of (1) through (3), the candidate operator will receive a learners permit. A copy of the permit will be forwarded to the FMO. The original must be with the candidate operator at all times.

b. Qualification training.

(1) The candidate operator will demonstrate operating knowledge of the aviation refueler and defueler.

(2) The candidate operator will drive and operate an aviation refueler/defueler for two weeks accompanied by a licensed operator.

(3) The candidate operator will complete the watchstation portion of the following PQS for Fuel Operations Ashore:

(a) NAVEDTRA 43288-307 (Refueling Operator)

(b) NAVEDTRA 43288-308 (Defueling Operator)

(c) NAVEDTRA 43288-309 (Ground Fuels Operator)

(d) NAVEDTRA 43288-310 (Direct Refueling Operator)

(4) The candidate operator will pass a written exam.

(5) The candidate operator will pass a road test.

Final PQS certification will be accomplished upon completion of the qualification portion of driver training. Appropriate entries will be made in the training jacket and a U.S. Government motor vehicle operator identification card will be issued.

4. **SUPPLEMENTAL TRAINING.**

a. Safety Training. Each licensed operator will receive 3 hours of driver safety training each quarter (one hour per month).

b. Spot Check Program. Periodically and unannounced, the training petty officer shall ride with all licensed operators and observe their driving technique. Monthly driver evaluations will be made and entered into the individual training record.

c. Re-certification Program.

(1) Semi-annually, each licensed operator will be required to complete a re-certification road test. Each licensed operator will complete an obstacle course comprised of equally spaced safety cones (cones should be placed 32 ft apart. The total length of an aircraft refueler is 30 ft). The driver will inspect the truck for any safety infractions, then proceed through the course. A maximum of four cones can be hit. If five or more are hit the driver will go through the obstacle course again. If the driver again fails, the training petty officer and LPO will evaluate the driver's past performance and make a recommendation for additional training.

(2) The re-certification process will be scheduled to coincide with the changing of the seasons (i.e. summer to winter and vice versa). This will allow for the training petty officer to re-emphasize any special precautions required for the up coming season. The written test will reflect these precautions.

5. **MISHAP INVESTIGATION**. Any mishap or fuel related incident will be investigated by the training petty officer. All findings will be routed to the Supply Officer via the FMO. A fuels mishap point system will established to assist in the evaluation of driving records. The point system will be comprised of the following:

a. Excessive Speed - 2 pt.

b. Hazardous driving - 3 pt.

c. Minor accident - 4 pt. (no damage to truck or equipment)

d. Accident - 5 pt. (damage to truck or equipment)

Once a driver has accumulated 10 points, he or she will have to complete the driver training program again and be re-certified.

A report chit will be written for any accident that can be attributed to negligent driving (i.e. sleeping, leaving appointed place of duty, etc).

6. **EQUIPMENT UTILIZED**.

a. Aviation refueler/defueler.

b. Safety cones.

7. **FORMS AND DOCUMENTS UTILIZED**.

a. Training record.

b. Training documentation.

(1) Documented safety lectures.

(2) Signed PQS program sheets.

(3) Final certification letter.

(4) Recertification letter.

(5) Driver training qualification check-off sheets.

c. Training monitor sheet.

d. U.S. Government motor vehicle operators identification card.

8. **DISTRIBUTION OF FORMS**.

a. Original training documentation to individual training file.

(1) Copy of final certification letter to FMO.

(2) Copy of recertification letter to FMO.

b. Original operator ID card to respective operator.

(1) Copy of operators ID card to FMO.

DRIVER QUALIFICATION CHECKOFF SHEET

1. **INDOCTRINATION TRAINING.**

( ) Ride two weeks with a qualified licensed driver.

Name:_____ Date:_____

( ) Complete NAVEDTRA 43288-307 Fundamentals & Systems PQS.

Name:_____ Date:_____

( ) Complete NAVEDTRA 43288-308 Fundamentals & Systems PQS.

Name:_____ Date:_____

( ) Complete NAVEDTRA 43288-309 Fundamentals & Systems PQS.

Name:_____ Date:_____

( ) Complete NAVEDTRA 43288-310 Fundamentals & Systems PQS.

Name:_____ Date:_____

( ) Receive learners permit.

Name:_____ Date:_____

2. **QUALIFICATION TRAINING.**

( ) Accompanied by a qualified driver, operate a refueler vehicle for two weeks.

Name:_____ Date:_____

( ) Complete NAVEDTRA 43288-307 watchstation PQS.

Name:_____ Date:_____

( ) Complete NAVEDTRA 43288-308 watchstation PQS.

Name:_____ Date:_____

( ) Complete NAVEDTRA 43288-309 watchstation PQS.

Name:_____ Date:_____

( ) Complete NAVEDTRA 43288-310 watchstation PQS.

Name:_____ Date:_____

( ) Pass a road test.

Name:_____ Date:_____

( ) Receive U. S. Government motor vehicle operator identification card.

Name:_____ Date:_____

3. **RE-CERTIFICATION TRAINING**.

( ) Complete a road test.

( ) Re-certification #1.

Name:_____ Date:_____

( ) Complete a road test.

( ) Re-certification #2.

Name:_____ Date:_____

( ) Complete a road test.

( ) Re-certification #3.

Name:_____ Date:_____

( ) Complete a road test.

( ) Re-certification #4.

Name:_____ Date:_____

( ) Complete a road test.

( ) Re-certification #5.

Name:_____ Date:_____

( ) Complete a road test.

( ) Re-certification #6.

Name:_____ Date:_____