Report Date: 02 Nov 2020

551-SST-8362
Direct Fueling Operations
Status: Approved

Security Classification: U - Unclassified

Distribution Restriction: Approved for public release; distribution is unlimited.

Destruction Notice: None

Foreign Disclosure: FD1 - This training product has been reviewed by the training developers in coordination with the Transportation School Fort Lee, VA 23801 foreign disclosure officer. This training product can be used to instruct international military students from all approved countries without restrictions.

Conditions: Assigned as a Marine Deck or Engineer Warrant Officer, Soldier is required to direct fueling operations. Given TM 4-15.21, a completed risk assessment, a vessel in port or at sea, all applicable publications, forms, and records, tools, materials, personnel, equipment in all weather conditions day or night in an operational environment. Some iterations of this task should be performed in MOPP 4.

Standards: On orders; Soldier will direct fueling operations to ensure vessel is operational and all associated equipment is functioning properly, utilizing the task Go/ No-Go criteria. Comply with all warnings, cautions, and notes listed in references; TM 4-15.21, TB 55-1900-206-14, and CFR 33 Parts 125-199. Soldier must perform this taskIAW TM 4-15.21 with 100% compliant or without error.

Special Conditions: None

Safety Risk: Low

MOPP 4: Sometimes

Task Statements

Cue: Assigned as a Marine Deck or Engineer Warrant Officer, Soldier is required to direct fueling operations.

DANGER

ELECTRICAL HAZARDS
Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment. Do not be misled by the term "low voltage." Potentials as low as 50 volts may cause death under adverse conditions". Be careful not to contact 115-Vac input connections when installing or operating this equipment. Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through the body.

WARNING

MOVING MACHINERY HAZARDS
Be very careful when operating or working near moving machinery. Running engines, rotating shafts, and other moving machinery parts could cause personal injury or death.

CAUTION

MODIFICATION HAZARD
Unauthorized modifications, alterations or installations of or to this equipment are prohibited and are in violation of AR 750-10. Any such unauthorized modifications, alterations or installations could result in death, injury or damage to the equipment.

HIGH PRESSURE HYDRAULIC SYSTEM HAZARDS
Hydraulic systems can cause serious injuries if high pressure lines or equipment fail. Never work on hydraulic systems or equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment, and who can give first aid. A second person should stand by controls to turn off hydraulic pumps in an emergency. When the technicians are aided by the operators, the operators must be warned about dangerous areas.

Remarks: None

Notes: 1. Equipment is not all the same and may function differently depending on the make, model, and manufacturer. Troubleshooting steps are similar, but may vary. Always consult the applicable manufacturer's literature for each piece of equipment. 2. Tests should be conducted as specified in the manufacturer's literature or industry standards. 3. Defective equipment should be repaired or replaced immediately and not used until correctly repaired or replaced.

Performance Steps

1. Apply Pollution control and Abatement Procedures

a. Oil pollution guidance

(1) Oil - Means oil of any kind in any form, including, but not limited to petroleum, fuel oil, sludge, oil refuse, oil mixed with ballast or bilge water and oil mixed with other than dredged spoil.

(2) Sheen - Means an iridescent appearance on the surface of the water.

(3) Discharge - Includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying or dumping.

b. Reportable Spill
Note: Refer Students to 40 CFR 110.3

(1) In accordance with 40 CFR 110.3, a reportable spill is any discharge that causes a film or sheen upon, discoloration of the surface of the water or adjoining shorelines or causes a sludge or emulsion to be deposited beneath the surface of the water. A reportable spill is also one that violates applicable water quality standards.

(a) Hazardous waste. Reportable quantities are based on the chemical toxicity. Appendix B of 40 CFR 302.4 lists hazardous chemicals and the reportable quantity. The quantities generally vary from 10 to 100 pounds.

(b) The first procedure in the event of a spill is to stop the transfer of fuel.

(2) TB 55-1900-206-14

(a) Guidance in this Department of the Army technical bulletin is very specific and straight forward. All Army components are expected to demonstrate leadership in
environmental pollution abatement program.

(b) The Armys policy is, until such time an acceptable onboard treatment of watercraft pollutants is developed, all pollutants (sewage, bilge, fuel, lubricants, and
non-human wastes) will be retained aboard the watercraft until such time as they can be taken ashore and disposed of in accordance with locally approved disposal procedures.

(c) In other words, nothing is dumped overboard unless it goes through an approved treatment system, i. e. sewage treatment plants and oily water separators.

(3) Note: Refer student to Ref. Title 33 CFR 151.09 (b) (3).

Title 33 CFR part 151.

(a) Within 12 nautical miles of the nearest land, any discharge of oil or oily mixtures into the sea from
a ship is prohibited, except when all of the following is satisfied:

_1_ The oil content does not exceed 15 PPM.

_2_ The vessel has in operation oily-water separating equipment, a bilge monitor,bilge alarm or combination thereof.

(b) NOTE: Ref. Title 33 CFR 151.09 (a) (5)

Prohibits the discharge of oily mixtures when more than 12 nautical miles from the nearest land.
Unless:

_1_ Oily mixture does not exceed 100 PPM.

_2_ The vessel has in operation, an oily water separator.

c. Prudent preventive pollution control steps.

(1) The easiest, most effective, and least expensive of all available steps would be for supervisors to enhance awareness and training of their personnel.

(2) Always follow up with enforcement.

d. Control Steps

(1) Minimize and control oily waste.

(2) Do not drain machinery sumps into bilge's. This is a direct violation of the Code of Federal Regulations.

(3) Eliminate or minimize oil, grease, and fuel leaks from all machinery and associated piping.

(4) Use drip pans to the maximum extent possible.

(5) Have emergency spill kits available.

(6) Provide sound written guidance, i.e. SOPs, oil transfer procedures.

e. Oil Spill Contingency Plan

(1) Within Third Port

(a) Units are responsible for spills up to 50 gallons, unless the spill enters the water.

(b) If the spill cannot be contained and entry into the waterway is eminent, then responsibility goes to the Fort Eustis Fire Department. They are equipped with necessary equipment and Coast Guard trained personnel. An important point to remember is that once containment is accomplished, it will be the responsibility of the unit to provide clean up personnel.

(c) In all cases, notify the Third Port Harbormaster in cases of a spill. The Harbormaster will initiate notification for activation of the spill contingency plan, and hopefully notify appropriate offices.

(2) Outside Third Port

(a) NOTE: Ref. Title 40 CFR 110.10

In all cases take immediate steps to control and contain the spill. Remember...asper the guidance established in Department of Defense Directive number 5030.41, dated 1 June 1977, the use of dispersants is prohibited except to reduce fire or safety hazards, or to protect waterfowl from floating oil. Dispersants include water, or chemicals to emulsify, disperse, solubilize or precipitate oil.

(b) Report also any sighted discharge to the National Research Center.

(c) AR 200-1, Environmental Protection and Enhancement, stipulate that the National Research Center will automatically notify the Coast Guard and the Environmental Protection Agency.

(d) Notification will include the location, amount, time, circumstances, type of discharge, name of discharger (if known), sea conditions and current weather.

f. Penalties

(1) According to the EPA. If you are the responsible party to an oil spill, you may be required to pay for any damages and cleanup costs resulting from that oil spill. Third parties also may be held responsible for damages and removal costs if the responsible party shows that the spill resulted from an incident caused solely by an act or omission by a third party. Administrative penalties can reach $157,500 and civil penalties imposed in a judicial proceeding can reach $32,500 per violation per day, or $1,100 per barrel of oil spilled if the oil reaches waters of the United States or adjoining shorelines.

(2) The fine for failing to notify the appropriate federal agency of an oil spill can reach a maximum of $250,000 for an individual or $500,000 for an organization. The maximum prison term is five years. The criminal penalties for violations have a maximum fine of $250,000 and 15 years in prison.

(3) The Spill Prevention, Control and Countermeasure (SPCC) regulation is implemented at the federal level; however, states and localities may also have oil programs through which they may impose additional penalties (including unlimited liability), funding mechanisms, requirements for removal actions, and fines and penalties for responsible parties.

(4) 33 CFR 153.205
"Section 311(b)(5) of the Act prescribes that any person who fails to notify the appropriate agency of the United States Government immediately of a discharge is, upon conviction, fined in accordance with Title 18, U.S. Code, or imprisoned for not more than 5 years, or both"

2. Direct fueling and refueling Procedures

a. Fuel Tank.

NOTE: Draw a F/O tank diagram and discuss the following;

(1) Fill pipe

(2) Containment System: Vent and screen

(a) A ship of 300 gross tons or more must have a fixed container or

(b) Enclosed deck area under or around each fuel oil or bulk lubrication oil tank vent, overflow, and fill pipe.

NOTE: The 100 ft. Tug is 390 tons, but it is grand fathered against this regulation.

(3) Sounding tube and striker plate.

(4) Interior baffles

(5) Structural sedimentary filter and drain.

(6) Fuel pick up pipe.

b. Preparation for Fueling

NOTE: Regulated by Title 33 CFR 154, 155 and 156 as well as the U.S.C.G. Marine Safety Manual, Chapter 31.

(1) Vessel Preparation

(a) SAFETY will be the primary concern at all times during fueling operations.

(b) Heat producing work is PROHIBITED.

(c) Smoking will be PROHIBITED during fueling of Army watercraft.

(d) Complete soundings

_1_ Prior to arriving at the fuel facility the exact amount of fuel and type (diesel # 2, MIL SPEC 9000) required for your vessel should be known.

_2_ It is also a good practice to know how much fuel you need to go to 85%, 90% and 95% for each tank.

_a_ Keep tanks full to 95% (when possible)

[1] Reduces condensation.

[2] Maintains vessel readiness.

[3] Operating on a near empty tank, in rough seas, can result in an engine failure at the most unexpected time.

_b_ 90% in hot climates

(e) Cleanliness / Housekeeping.

_1_ Pick up rags, dunnage, trash etc.

_2_ Anything that could contribute to a fire.

(f) Assemble necessary equipment.

_1_ Containment devices. It is always a good practice to have a few buckets readily on hand.

_2_ Fixed and portable fire extinguishers on hand.

_3_ Emergency spill kits. If your budget permits, these items can be procured locally. (Required by Harbor Master).

_4_ Sounding tape and paste or chalk.

_5_ Handheld radios.

_6_ Sounding tables

(g) Secure all portholes, scuppers, hatches freeing ports and ventilation intakes on the side where fuel is being taken on.

_1_ This prevents fumes from entering machinery spaces.

_2_ Aids in spill containment if needed.

(2) OIL TRANSFER PROCEDURES

NOTE: Reference 33 CFR 155.720 and 155.750.

(a) SOPs Are required for any vessel having a capacity for 250 or more barrels (10,500 gallons) of oil or hazardous material.

(b) The procedures must address transfer of fuel oil to or from the vessel.

(c) The written procedure for internal tank to tank transfer must be as detailed as that established for off the vessel.

(d) These requirements have been established due to the high number of documented spills from fuel oil day tank transfers, and others.

c. Oil transfer procedural list.

(1) A list of each product transferred to or from the vessel:

(2) Generic or chemical name. Safety Data Sheet (SDS) information ie.; (Description of the appearance, odor, hazards in handling, instructions for safe handling, procedures for spills, and fire fighting procedures. (Basically, this information is covered on a SDS)

(3) Line diagram on transfer piping, including all valves, pumps, control devices, vents and overflows.

(4) Location of all shut off valves.

(5) Procedures for properly emptying discharge containment systems without discharging into the water. Containment systems such as the enclosed deck are around all oil tank vents, overflows, and tank receptacles.

(6) The number of personnel required to be on duty during all transfer operations.

(7) The duties, by title, of each officer, person in charge, deckhands, engineers and any other required.

(8) Procedures and duty assignments for tending vessels mooring during transfer of oil.

(9) Procedures for operating emergency shutdown and communication. This emergency procedure is required to stop the flow of oil to a facility, another vessel, or within the vessel.

d. Pump motor controller.

(1) Emergency shutdown. May be a pump control, a quick acting or power actuated valve, or an operating procedure. Usually, these items will be found on deck, next to the applicable discharge receptacle.

(2) Communications. Very important. Means of notification, continuous two-way communication is required between persons in charge (facility & vessel). If portable radios are utilized hey must be intrinsically safe.

e. PROCUREMENT OF FUEL

(1) U.S. Government Credit Card. The vendor must be willing to accept the credit card.

(2) DD Form 1149.

(a) Usually made out by port operations or units Vessel Supply Office (VSO).

(b) Signed by Unit Commander, BN Property Book Officer (BN-S4) and DPTMSEC.

(c) Vessel receives 4 copies.

f. DECLARATION OF INSPECTION

(1) In Third Port - sign required documentation (Declaration of Inspection prior to any fuel transfer).The declaration of inspection is addressed in CFR 165.150. A copy of the completed form will be maintained by the facility and the vessel for 30 days from date of signature.

(2) No transfer operation can begin until the person in charge of the facility and the receiving vessel have inspected, and properly annotated the Declaration of Inspection form. Signed copy must be kept in the Person In Charge's possession during operations (Generally the Chief or the ACE)

g. Inspection items.

(1) Vessel mooring. Strong enough to hold during all expected surges, current, weather and allow for tidal changes.

(2) Hoses:

(a) Proper length. Allows for movement of vessel.

(b) Properly supported. To prevent kinking and strain on couplings

(c) Blanked off. All hoses that are not connected for the transfer operation will be properly blanked off with a closure device.

(d) Serviceable. No gouges, cuts, or slashes that penetrate the first layer of reinforcement. No unrepaired loose covers, bulges, kinks or soft spots. (33 CFR 156.170).

(e) Properly marked. Date of last annual pressure test (one and one half times maximum allowable working pressure), date of manufacture, maximum allowable working pressure, product utilized for or "Oil service" (33 CFR 154.500).

(3) Properly aligned to allow flow.

(4) Connections: (33 CFR 156.130).

(a) If flanges meet the American National Standards Institute (ANSI) requirements, use no less than four bolts, one in every other hole. For flanges not meeting the ANSI standards, use a bolt in every hole.

(b) Bolts will be of the correct size, without signs of wear, elongation or strain.

(c) Leak free.

(5) Discharge containers properly drained and ready to provide the required capacity.

(6) Communication established. Hand held radios must be intrinsically safe. Furthermore, one person must be present that speaks the language or languages of the persons in charge.

(7) Person in charge of the facility, and the receiving vessel is established.

(a) Must be on site, and immediately available.

(b) Possess a copy of the vessels oil transfer procedures.

(8) Required personnel present as per oil transfer procedures. The following could be recommended:

(a) Fire team / spill response team.

(b) Person in charge

(c) Fuel sounding personnel.

(d) Fuel manifold person.

(e) Line watch.

(9) Lighting requirements meet if during hours of sunset to sunrise (33 CFR 155.790). A vessel with the capacity of 250 or more barrels of oil must have deck lighting to illuminate the following:

(a) Transfer connection points.

(b) Oil transfer operation work area.

(10) Warning signals. Hoist the Bravo flag.

(11) Grounding (Bonding Strap) cable properly attached.

(a) This means metal to metal contact BEFORE any hoses are attached. Failure to do so may cause an abrupt discharge of stored static electricity in the form of a spark. This is even more of a hazard during the winter months.

(b) Disconnect only after all the fueling hoses are removed.
NOTE: The fueling hoses that are wire reinforced with metal ends can be used as the grounding strap.

h. CONFERENCE

(1) Note: The Chief Engineer and the fuel facility personnel must meet before the fueling transaction.(33 CFR 156.120); Person in charge (PIC).(33 CFR 155.700). The operator of each vessel that as a capacity for 250 or more barrels of oil shall designate the person or persons in charge of each transfer of oil to or from the vessel. (LCU 2000 can hold approximately 2200 barrels of fuel.

(a) The "Person in Charge" is responsible for securing fueling operations in the event of hose, valve manifold, over filling or other emergency.

(b) The "Person in Charge" is designated in writing.

(c) He must be able to monitor the system from the fuel shut off area.

(d) He must STAY at or near the "usual operating station".

(e) The "most dependable" person should visually observe all functions and all portions of the fueling operations.

_1_ The identity of the product to be transferred.

_2_ The sequence of the transfer operation.

_3_ The transfer rate. This is very important. Know the maximum allowable fueling rate of the receiving vessels fuel system. The LCU 2000s can accept at a maximum rate of 100 GPM. Many Navy and commercial facilities are capable of pumping numerous barrels per minute of fuel, which could quickly exceed the capabilities of the receiving vessels system.

_4_ The name or title and location of each person participating in the transfer operation.

_5_ Details of the transferring and receiving system.

_6_ Critical stages of the operation.

_7_ Rules that apply (federal, state or local).

_8_ Fueling shut down signals need to be discussed.

_9_ Quantity of fuel to be transferred.

(2) There must be a complete understanding between the two personnel. A "Person In Charge" is designated for the vessel and the facility. COMMUNICATION IS MANDATORY.

i. Fuel Sample

(1) It is the duty of the Chief Engineer to ensure that a one half pint fuel sample is drawn, sealed and properly labeled. This sample will be retained until the represented fuel is exhausted. (46 CFR 97.15-55)

Note: A prudent engineering practice recommended by Naval Ships Technical Manual NAVSEA) is to sample at the beginning middle, end and every 15 minutes of the fueling operations.

(2) Observe sample for sediment and water contamination. Sample appearance will be either dull, hazy, or milky in color depending on the degree of water contamination.

Note: To further investigate a sample contaminated with water, NAVSEA recommends heating the sample to 25 deg. F above the temperature in the tank. If the cloudy appearance disappears, the fuel is acceptable.

(3) Label samples with the facility name, date and time, fuel type, quantity and ambient temperature.

j. Fuel Manifold

(1) One man on deck to relay messages to the fuel facility.

(2) One man operating and responsible for the fuel manifold, always on station.

(3) One man monitors the fuel level with a sounding tape. Automatic gages (tank level indicators, TLIs) may be used in addition to but not in lieu of the sounding tape.

(4) When tanks are at 85% capacity, reduce the delivery pressure.

(5) Secure the fueling operation at 95% capacity. This percentage must include any fuel left in the lines that will be "blown through" into your fuel tanks

(6) Remember to leave enough personnel on board to handle any emergencies that might arise.

NOTE: Point out to the students some preliminary cautions that should be taken if the facility utilizes pressurized air to clear their fuel lines, i.e. install tank sounding tube deck plugs prior to blowing out fuel lines.

k. After fueling operations.

(1) Secure fueling operations.

(2) Disconnect hoses.

(3) Disconnect bonding (grounding) strap at fuel facility FIRST. An arc at the vessel can ignite the vapors. Sometimes it is impossible to do since the grounding strap is permanently fastened to the pier facility or barge. Removing the grounding strap at the vessel first should be avoided if at all possible.

(4) Disconnect the grounding strap at the vessel SECOND.
NOTE: Grounding Straps are usually permanently mounted at the supplier end.

(5) Logbook entry by Chief Engineer (46 CFR 97.15-55).

(a) Quantity received and fuel type.

(b) Name of vendor.

(c) Name of the oil producer and flashpoint.

(d) Although it is not a regulatory requirement, it is a good practice to log start and stop times.

(e) The log book requires that these entries on the transfer of oils be made in red ink, or are underlined in red ink.

(Asterisks indicates a leader performance step.)

Evaluation Guidance: Score the Soldier a GO if all performance measures are correctly completed/pass (P). Score the Soldier a NO-GO if any of the performance measures are missed or incorrectly performed/fail (F).

Evaluation Preparation: Test this task in with applicable training material. Ensure Soldier understands why this task is important to support the overall training objective.

Setup: Test this task in in accordance with prescribed references or Technical Manual (TM).

Brief Soldier: Tell the Soldiers adhere to all Safety precautions when performing the task listed.

Note: Ensure that all required equipment to perform this task is available.

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Applied Pollution control and Abatement Procedures			
2. Directed fueling and refueling Procedures			

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary	Source Information
	TM 4-15.21	ARMY WATERCRAFT SAFETY	Yes	Yes	
	TM 55-1905-223-10	Operator's Manual for Landing Craft, Utility (LCU 2000 CLASS) (NSN 1905-01-154-1191) (Reprinted W/Basic Incl C1-9) (This item is included on EM 0273)	Yes	No	
	TM 55-1915-200-10	Operator's Manual for Logistic Support Vessel (LSV) (NSN 1915-01-153-8801) (Reprinted W/Basic Incl C1-6)	Yes	No	
	TM 55-1925-236-12	OPERATOR AND UNIT MAINTENANCE MANUAL FOR SMALL TUG (ST) (NSN 1925-01-435-1713)	Yes	No	
	TM 55-1925-273-10-1	Operator's Manual For Inland Coastal Large Tug (LT) (NSN 1925-01-509-7013)(EIC XAG)	Yes	No	

TADSS : None

Equipment Items (LIN): None

Materiel Items (NSN) :

Step ID	NSN	LIN	Title	Qty
No materiel items specified				

Environment: Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to the current Environmental Considerations manual and the current GTA Environmental-related Risk Assessment card. In a training environment, leaders must perform risk management in accordance with ATP 5-19, Risk Management. Leaders will complete a DD Form 2977 DELIBERATE RISK ASSESSMENT WORKSHEET during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC), as well as any other variables.

All operations will be performed to protect and preserve Army personnel and property against accidental loss. Procedures will provide for public safety incidental to Army operations and activities and safe and healthful workplaces, procedures, and equipment. Observe all safety and/or environment precautions regarding electricity, cable, and lines. Provide ventilation for exhaust fumes during equipment operation and use hearing protection when required IAW AR 385-10, the Clean Air Act (CAA) and the CAA amendments, and the OSHA Hazard Communication standard.

Accidents are an unacceptable impediment to Army missions, readiness, morale, and resources. Decision makers at every level will employ risk management approaches to effectively preclude unacceptable risk to the safety of personnel and property affiliated with this task. (a) Take personal responsibility. (b) Practice safe operations. (c) Recognize unsafe acts and conditions. (d) Take action to prevent accidents. (e) Report unsafe acts and

conditions.

No food or drink is allowed near or around electrical equipment (CPU, file servers, printers, projectors, etc.) due to possible electrical shock or damage to equipment. Exercise care in personal movement in and through such areas. Avoid all electrical cords and associated wiring. In event of electrical storm, you will be instructed to power down equipment.

Safety: In a training environment, leaders must perform a risk assessment in accordance with current Risk Management Doctrine. Leaders will complete the current Deliberate Risk Assessment Worksheet in accordance with the TRADOC Safety Officer during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW current CBRN doctrine. In a training environment, leaders must perform risk management in accordance with ATP 5-19, Risk Management. Leaders will complete a DD Form 2977 DELIBERATE RISK ASSESSMENT WORKSHEET during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC), as well as any other variables.

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Prerequisite Individual Tasks : None

Supporting Individual Tasks : None

Supported Individual Tasks : None

Supported Collective Tasks : None

Knowledges :

Knowledge ID	Knowledge Name
91L-K-0067	Knowledge of the Fuel System

Skills :

Skill ID	Skill Name
S0604	Ability to Read, Comprehend, and Perform Instructions in Equipment Technical Manuals

ICTL Data : None