

**STP 10-92F15-SM-TG**

**HEADQUARTERS  
DEPARTMENT OF THE ARMY**

**Soldier's Manual  
and Trainer's Guide**

**MOS  
92F**

**PETROLEUM SUPPLY SPECIALIST**

**SKILL LEVELS 1, 2, 3, 4, AND 5**

**MAY 2006**



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# SOLDIER'S MANUAL and TRAINER'S GUIDE

## MOS 92F

### Petroleum Supply Specialist Skill Levels 1, 2, 3, 4, and 5

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\*This publication supersedes STP 10-77F15-SM-TG, 8 May 1996.

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## PREFACE

This publication is for skill levels 1, 2, 3, 4, and 5 soldiers holding MOS 92F and for trainers and first-line supervisors. It contains standardized training objectives, in the form of task summaries, to train and evaluate soldiers on the critical tasks which support unit mission during wartime. Trainers and supervisors should ensure 92F qualified soldiers have access to this publication. It should be given the widest possible dissemination in areas such as work areas, training areas, learning centers, and units, as well as virtual libraries.

This publication applies to the Active Army, the Army National Guard (ARNG)/Army National Guard of the United States (ARNGUS), and the United States Army Reserve (USAR) unless otherwise stated.

The proponent of this publication is United States Army Training and Doctrine Command (TRADOC). Send comments and recommendations to U.S. Army Combined Arms Support Command on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to:

US ARMY COMBINED ARMS SUPPORT COMMAND  
DCT, TRAINING DIRECTORATE  
SUSTAIN DIVISION  
PETROLEUM, WATER, & LAB BRANCH  
FORT LEE, VA 23801-1511

Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

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# Chapter 1

## Introduction

1-1. General. This soldier training publication (STP) identifies individual military occupational specialty (MOS) training requirements for soldiers holding MOS 92F. Commanders, trainers, and soldiers should use it to plan, conduct, and evaluate individual training in units. The STP is the primary MOS reference for supporting self-development, evaluating MOS proficiency, and training of 92F soldiers. Commanders employ two primary methods to evaluate soldiers' proficiency:

- **Commander's evaluation.** Commander's evaluations are local tests or assessments of soldiers' performance of MOS-specific and common tasks critical to the unit mission. They may be conducted year-round.
- **Common task test (CTT).** CTTs are hands-on tests used to evaluate proficiency on common tasks. Alternate written tests are provided if equipment is not available for hands-on testing.
  - a. This publication is the soldier's primary reference to prepare for a commander's evaluation of MOS-specific tasks. It contains task summaries for all critical tasks specific to the MOS and skill level (SL). Commanders and trainers will use this soldier's manual/trainer's guide (SM/TG) to plan and conduct training and commander's evaluations.
  - b. Chapter 2, Trainer's Guide, contains information needed to plan training requirements for this MOS. The trainer's guide--
    - Identifies subject areas in which soldiers must be trained.
    - Identifies critical tasks for each subject area.
    - Specifies where soldiers are initially trained on each task.
    - Recommends how often each task should be trained to sustain proficiency.
    - Recommends a strategy for cross-training soldiers.
    - Recommends a strategy for training soldiers to perform higher-level tasks.

Use this STP along with STP 21-1-SMCT (Soldier's Manual of Common Tasks, Skill Level 1), STP 21-24-SMCT (Soldier's Manual of Common Tasks, Skill Levels 2-4), Army training and evaluation programs (ARTEPs), FM 25-4 (How to Conduct Training Exercises), FM 25-5 (Training for Mobilization and War), FM 7-0 (Training the Force), and FM 7-1 (Battle-Focused Training) to establish effective training plans and programs that integrate soldier, leader, and collective tasks.

1-2. Task Summaries. Task summaries outline wartime performance requirements for each critical task in the STP. They provide both soldier and trainer with the information necessary to prepare, conduct, and evaluate critical task training. As a minimum, task summaries include information soldiers must know and skills they must perform to standard for each task. Following is the task summary format:

- **Task number.** The task number is a 10-digit number that identifies the task and skill level. Include the task number and title in any correspondence relating to the task.

- **Task title.** The task title identifies the action to be performed.
- **Conditions.** The task conditions statement describes the field or garrison conditions under which the task will be performed and identifies the equipment, tools, references, job aids, and supporting personnel that the soldier needs to perform the task in wartime.
- **Standards.** The task standards describe how well and to what level of proficiency the soldier must perform the task under wartime conditions. Standards are typically expressed in terms of accuracy, completeness, duration, sequence, speed, and tolerance.
- **Performance steps.** This section provides, in detail, what is required on how to perform the task.
- **Performance measures.** This section identifies specific actions that the soldier must accomplish to complete the task successfully. Performance measures appear in a GO/NO-GO rating format for easy evaluation. Some tasks may also include detailed training information in a Training Information Outline and an Evaluation Preparation Section. The Evaluation Preparation Section indicates necessary modifications to task performance in order to train and evaluate a task that cannot be trained to the wartime standard under wartime conditions. It may also include special training and evaluation preparation instructions to accommodate these modifications and any instructions that should be given to the soldier before evaluation.
- **References.** This section identifies references that provide more detailed explanations of task performance requirements than are given in the task summary.
- **Warnings.** Warnings alert users to the possibility of immediate personal injury or equipment damage.
- **Notes.** Notes provide additional supportive explanations or tips relating to task performance.

1-3. **Soldier's Responsibilities.** Each soldier is responsible for performing individual tasks identified by the first-line supervisor based on the unit's mission-essential task list (METL). Soldiers must perform tasks to the standards included in the task summary. If soldiers have questions about tasks or which tasks in this manual they must perform, they are responsible for asking their first-line supervisor for clarification. First-line supervisors know how to perform each task or can direct soldiers to appropriate training materials, including current field manuals, technical manuals, and Army regulations. Soldiers are responsible for using these materials to maintain performance. They are also responsible for maintaining performance of all common tasks listed in the soldier's manual of common tasks (SMCTs) at their current skill level and below. Periodically, soldiers should ask their supervisor or another soldier to check their performance to ensure that they can perform the tasks.

1-4. **NCO Self-Development and the STP.** Self-development is a key component of leader development. Leaders follow planned, progressive, sequential self-development programs developed by the individual noncommissioned officer (NCO) and his/her first-line supervisor to enhance and sustain military competencies. Self-development consists of individual study, research, professional reading, practice, and self-assessment. The self-development concept requires NCOs, as Army professionals, to take responsibility for remaining current in all phases of their MOS. The STP is the NCO's primary source for maintaining MOS proficiency. Another important resource for self-development is the Army Correspondence Course Program (ACCP). Refer to DA Pamphlet 350-59 (Army Correspondence Course Program Catalog) for detailed eligibility requirements and enrollment information. The catalog is available at local education centers or on line through the Army Institute for Professional Development (AIPD) web site, <http://www.atsc.army.mil/accp/aipdnew.asp>. The web site offers on-line enrollment.

1-5. Commander's Responsibilities. Commanders must ensure that their unit training plans prepare the unit for war by enabling soldiers to develop and sustain proficiency in their MOS and skill level tasks. Commanders should design unit training programs to provide individual training for all soldiers assigned to the unit and to evaluate soldier proficiency routinely as part of the commander's evaluation program. The unit training program should also integrate individual training with crew drills and other collective training. The MOS training plan provides information on which to base integration, cross-train, train-up, and sustainment training programs. Commanders should use the MOS training plan when developing unit training plans.

1-6. Trainer's Responsibilities. Training is the business of all unit leaders. First-line leaders are the principal trainers in the unit because they directly supervise soldiers and lead crews, squads, sections, and teams.

a. Trainers can use the MOS training plan to determine the critical tasks each soldier is responsible for. They should tell each soldier which tasks he/she must be able to perform. Trainers should evaluate task performance to determine which tasks each soldier can or cannot perform to standard. Soldiers who cannot perform a task to standard need further training. Developing effective training is explained in detail in FM 7-0 and FM 7-1.

b. Every task summary in this STP includes performance measures, which trainers may use year-round to determine if soldiers can perform critical tasks to the specified standards. The performance measures identify what the trainer needs to observe to score a soldier's performance. A blank space is provided for the trainer to check either the GO or NO-GO column for each performance measure. Some tasks require the trainer to watch the soldier perform them (evaluate the process). Other tasks call for the trainer to focus on the results of the soldier's performance (evaluate the product). Comments should not be written on the task summary.

c. Trainers can monitor the progress of their soldiers by recording task GO/NO-GO results. Trainers may use DA Form 5164-R (Hands-On Evaluation) to record the performance measures a soldier passed or failed. The form, which may be locally reproduced, applies to all tasks in this STP. Trainers may have DA Form 5164-R overprinted with information unique to their training requirements before reproducing it. See Appendix A for instructions on how to obtain and fill out a copy of a DA Form 5164-R.

d. Trainers may use DA Form 5165-R (Field Expedient Squad Book) to record hands-on GO/NO-GO results for a group of soldiers (for example, a crew, section, or squad) having the same MOS and skill level. This form supports conduct of commander's evaluations and can be used to record training results gathered in the field during slack time for all MOSs and skill levels. Use of this form is optional. See Appendix B for instructions on how to obtain and fill out a copy of a DA Form 5165-R. Trainers should work with each soldier until tasks can be performed to specific task summary standards.

1-7. Training Support. References have been identified for each task to assist in planning and conducting training. A consolidated list of references identified by type, publication number, and title and a comprehensive glossary of acronyms, abbreviations, and definitions are included in this STP.

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## Chapter 2

### Trainer's Guide

2-1. General. The MOS Training Plan identifies the essential components of a unit training plan for individual training. Units have different training needs and requirements based on differences in environment, location, equipment, dispersion, and similar factors. Therefore, the MOS Training Plan should be used as a guide for conducting unit training and not a rigid standard. The MOS Training Plan consists of two parts. Each part is designed to assist the commander in preparing a unit training plan which satisfies integration, cross training, training up, and sustainment training requirements for soldiers in this MOS.

a. Part One of the MOS Training Plan shows the relationship of an MOS skill level between duty position and critical tasks. These critical tasks are grouped by task commonality into subject areas.

b. Section I lists subject area numbers and titles used throughout the MOS Training Plan. These subject areas are used to define the training requirements for each duty position within an MOS.

c. Section II identifies the total training requirement for each duty position within an MOS and provides a recommendation for cross training and train-up/merger training.

(1) Duty Position column. This column lists the duty positions of the MOS, by skill level, which have different training requirements.

(2) Subject Area column. This column lists, by numerical key (see Section I), the subject areas a soldier must be proficient in to perform adequately in that duty position.

(3) Cross Train column. This column lists the recommended duty position for which soldiers should be cross trained.

(4) Train-up/Merger column. This column lists the corresponding duty position for the next higher skill level or military occupational specialty code (MOSC) the soldier will merge into on promotion.

d. Part Two lists, by general subject areas, the critical tasks to be trained in an MOS and the type of training required (resident, integration, or sustainment).

(1) Subject Area column. This column lists the subject area number and title in the same order as Section I, Part One of the MOS Training Plan.

(2) Task Number column. This column lists the task numbers for all tasks included in the subject area.

(3) Title column. This column lists the task title for each task in the subject area.

(4) Training Location column. This column identifies the training location where the task is first trained to soldier training publications standards. If the task is first trained to standard in the unit, the word "Unit" will be in this column. If the task is first trained to standard in the training base, it will identify, by brevity code (ANCOC, BNCOC, and so on), the resident course where the task was taught. Figure 2-1 contains a list of training locations and their corresponding brevity codes.

<b>AIT</b>	Advanced Individual Training
<b>UNIT</b>	Trained in the Unit
<b>BNCOC</b>	Basic NCO Course
<b>ANCOC</b>	Advanced NCO Course

**Figure 2-1. Training Locations**

(5) Sustainment Training Frequency column. This column indicates the recommended frequency at which the tasks should be trained to ensure soldiers maintain task proficiency. Figure 2-2 identifies the frequency codes used in this column.

<b>BA</b> - Biannually
<b>AN</b> - Annually
<b>SA</b> - Semiannually
<b>QT</b> - Quarterly
<b>MO</b> - Monthly
<b>BW</b> - BI-weekly
<b>WK</b> - Weekly

**Figure 2-2. Sustainment Training Frequency Codes**

(6) Sustainment Training Skill Level column. Figure 2-3 lists the skill levels of the MOS for which soldiers must receive sustainment training to ensure they maintain proficiency to soldier's manual standards.

92F50 MSG THROUGH SGM
92F40 SFC
92F30 SSG
92F20 SGT
92F10 PV1 THROUGH SPC

**Figure 2-3. Career Progression Chart**

2-2. Subject Area Codes.

**Skill Level 1**

- 1 General Petroleum Operations
- 2 Tank Vehicles
- 3 Class III Operations
- 4 Pipeline Operations

**Skill Level 2**

- 5 Supervising General Petroleum Operations
- 6 Supervising Tank Vehicles
- 7 Supervising Class III Operations
- 8 Supervising Pipeline Operations

**Skill Level 3**

- 9 Directing General Petroleum Operations
- 10 Directing Tank Vehicles
- 11 Directing Class III Operations
- 12 Directing Pipeline Operations

**Skill Level 4**

- 13 Controlling General Petroleum Operations
- 14 Controlling Tank Vehicles
- 15 Controlling Class III Operations
- 16 Controlling Pipeline Operations

**Skill Level 5**

- 17 Evaluating General Petroleum Subjects and Tank Vehicles
- 18 Evaluating Class III and Pipeline Operations

2-3 Duty Position Training Requirements.

<i>Duty Position</i>	<i>Subject Area</i>	<i>Cross-Train</i>	<i>Train-Up/Merger</i>
SL 1 Petroleum Supply Specialist	1 - 4	NA	92F2 Petroleum Supply Foreman
SL 2 Petroleum Supply Foreman	1 - 8	NA	92F3 Petroleum Supply Sergeant
SL 3 Petroleum Supply Sergeant	1 - 12	NA	92F4 Petroleum Supply Supervisor
SL 4 Petroleum Supply Supervisor	1 -15	NA	92F5 Petroleum Operations Sergeant
SL 5 Petroleum Operations Sergeant	1-17	NA	Petroleum Laboratory/Water Treatment Supervisor

2.4. Task Correlation Hierarchy. Tasks performed at the lower skill levels correlates with tasks at the next higher level. This results in a hierarchy structure which in concept forms a pyramid. As a result, there are fewer tasks at the higher levels. The tasks at the highest skill levels encompass all the skills that were mastered at the lower skill levels. Therefore the soldier must master lower skill level tasks in order to ascend to the next higher skill level.

**CRITICAL TASKS LIST  
MOS TRAINING PLAN  
92F15**

**CRITICAL TASKS**

<i>Subject Area</i>	<i>Task Number</i>	<i>Title</i>	<i>Training Location</i>	<i>Sust Tng Freq</i>	<i>Sust Tng SL</i>
<b>Skill Level 1</b>					
1: GENERAL PETROLEUM OPERATIONS	101-92F-1178	Sling Load Packaged Petroleum Products	AIT	MO	1-2
	101-92F-1308	Identify Major Categories of Petroleum Products	AIT	MO	1-2
	101-92F-1309	Perform Firefighting Operations	AIT	MO	1-2
	101-92F-1403	Sample Petroleum Products	AIT	MO	1-2
	101-92F-1409	Convert Measured Quantity of Fuel to Net Quantity at 60 Degrees Fahrenheit	AIT	MO	1-2
	101-92F-1412	Prepare Accountability Forms for Petroleum Products	AIT	MO	1-2
	101-92F-1413	Employ Environmental Stewardship Protection Program Measures	AIT	MO	1-2
2: TANK VEHICLES	101-92F-1207	Perform Petroleum Railcar Operations	AIT	MO	1-2
	101-92F-1311	Perform Petroleum Waterborne Operations	AIT	MO	1-2
	101-92F-1410	Perform Refuel on the Move (ROM) Operations	AIT	MO	1-2
	101-92F-1414	Perform Petroleum Tank Vehicles Operations	AIT	MO	1-2
	101-92F-1415	Operate Pumps and Filter Separators	AIT	MO	1-2
	101-92F-1417	Operate the HEMTT Tanker Aviation Refueling System (HTARS)	AIT	MO	1-2
3: CLASS III OPERATIONS	101-92F-1153	Operate the Fuel System Supply Point (FSSP)	AIT	MO	1-2
	101-92F-1304	Operate Forward Area Refueling Equipment (FARE)	AIT	MO	1-2
	101-92F-1416	Operate the Assault Hoseline System	AIT	MO	1-2



**CRITICAL TASKS LIST  
MOS TRAINING PLAN  
92F15**

**CRITICAL TASKS**

<i>Subject Area</i>	<i>Task Number</i>	<i>Title</i>	<i>Training Location</i>	<i>Sust Tng Freq</i>	<i>Sust Tng SL</i>
	101-92F-1501	Operate the Advanced Aviation Forward Area Refueling System (AAFARS)	AIT	MO	1-2
	101-92F-1502	Operate the Remote Refueling, Rearming, Deployable, Distribution System (R3D2S)	UNIT	MO	1-2
	101-92F-1503	Operate the Load Handling Modular Fuel Farm (LMFF)	AIT	MO	1-2
	101-92F-1504	Operate the Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem	UNIT	MO	1-2
	101-92F-1505	Operate the Tactical Petroleum Terminal (TPT)	AIT	MO	1-2
4: PIPELINE OPERATIONS	101-92F-1204	Perform Transfer Operations	AIT	MO	1-2
	101-92F-1251	Operate Pipeline Pumps	AIT	MO	1-2
	101-92F-1256	Perform Pipeline Scraper Operations	AIT	MO	1-2
	101-92F-1322	Maintain Petroleum Pipeline Sections	AIT	MO	1-2
	101-92F-1401	Perform Interface Cut Operations	AIT	MO	1-2
	101-92F-1406	Prepare Petroleum Pump Station and Pipeline Reports	AIT	MO	1-2
<b>Skill Level 2</b>					
5: SUPERVISING GENERAL PETROLEUM OPERATIONS	101-92F-2315	Supervise Firefighting Operations	UNIT	SA	2-3
	101-92F-2401	Supervise Environmental Stewardship Protection Program Measures	UNIT	SA	2-3
	101-92F-2402	Supervise Sling Loading of Packaged Petroleum Products	UNIT	SA	2-3
	101-92F-2403	Supervise a Petroleum Pilferage Control Program	UNIT	SA	2-3
	101-92F-2404	Supervise Sampling and Gaging Procedures	UNIT	SA	2-3
6: SUPERVISING TANK VEHICLES	101-92F-2311	Supervise Petroleum Tank Vehicles Operations	UNIT	SA	2-3
	101-92F-2405	Supervise Petroleum Rail Tank Car Operations	UNIT	SA	2-3
	101-92F-2406	Supervise Pump and Filter Separator Operations	UNIT	SA	2-3

**CRITICAL TASKS LIST  
MOS TRAINING PLAN  
92F15**

**CRITICAL TASKS**

<i>Subject Area</i>	<i>Task Number</i>	<i>Title</i>	<i>Training Location</i>	<i>Sust Tng Freq</i>	<i>Sust Tng SL</i>
	101-92F-2407	Supervise Refuel on the Move (ROM) Operations	UNIT	SA	2-3
	101-92F-2408	Supervise Petroleum Waterborne Operations	UNIT	SA	2-3
	101-92F-2413	Supervise the HEMTT Tanker Aviation Refueling System (HTARS) Operations	UNIT	SA	2-3
7: SUPERVISING CLASS III OPERATIONS	101-92F-2158	Supervise the Fuel System Supply Point (FSSP) Operations	UNIT	SA	2-3
	101-92F-2304	Supervise Forward Area Refueling Equipment (FARE) Operations	UNIT	SA	2-3
	101-92F-2409	Supervise Assault Hoseline Operations	UNIT	SA	2-3
	101-92F-2501	Supervise the Advanced Aviation Forward Area Refueling System (AAFARS) Operations	UNIT	SA	2-3
	101-92F-2502	Supervise the Remote Refueling, Rearming, Deployable Distribution System (R3D2S) Operations	UNIT	SA	2-3
	101-92F-2503	Supervise the Load Handling Modular Fuel Farm (LMFF) Operations	UNIT	SA	2-3
	101-92F-2504	Supervise the Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem Operations	UNIT	SA	2-3
8 SUPERVISING PIPELINE OPERATIONS	101-92F-2253	Determine Interface Cut Operations	UNIT	SA	2-3
	101-92F-2410	Supervise Pipeline Operations	UNIT	SA	2-3
	101-92F-2411	Supervise Installation of Petroleum Valves and Pipeline Sections	UNIT	SA	2-3
	101-92F-2412	Supervise Transfer Operations	UNIT	SA	2-3
	101-92F-2505	Supervise the Tactical Petroleum Terminal (TPT) Operations	UNIT	SA	2-3
<b>Skill Level 3</b>					
9: DIRECTING GENERAL PETROLEUM OPERATIONS	101-92F- 3156	Direct a Petroleum Pilferage Control Program	BNCOC	AN	3-4
	101-92F-3303	Direct Sling Load Operations	BNCOC	SA	3-4

**CRITICAL TASKS LIST  
MOS TRAINING PLAN  
92F15**

**CRITICAL TASKS**

<i>Subject Area</i>	<i>Task Number</i>	<i>Title</i>	<i>Training Location</i>	<i>Sust Tng Freq</i>	<i>Sust Tng SL</i>
	101-92F-3307	Direct Sampling and Gaging Procedures	BNCOC	SA	3-4
	101-92F-3310	Implement a Petroleum Fire and Safety Program	BNCOC	SA	3-4
	101-92F-3312	Implement a Petroleum Environmental Stewardship Protection Program	BNCOC	SA	3-4
10: DIRECTING TANK VEHICLES	101-92F-3166	Direct Petroleum Waterborne Operations	BNCOC	AN	3-4
	101-92F-3302	Direct Unit Maintenance Within The Army Maintenance Management System (TAMMS)	BNCOC	AN	3-4
	101-92F-3311	Direct Refuel on the Move (ROM) Operations	BNCOC	AN	3-4
	101-92F-3313	Direct Tank Vehicle Operations	BNCOC	SA	3-4
	101-92F-3314	Direct Rail Tank Car Operations	BNCOC	SA	3-4
	101-92F-3317	Direct the HEMTT Tanker Aviation Refueling System (HTARS) Operations	BNCOC	SA	3-4
11: DIRECTING CLASS III OPERATIONS	101-92F-3215	Direct Forward Area Refueling Equipment (FARE) Operations	BNCOC	AN	3-4
	101-92F-3304	Direct Fuel System Supply Point (FSSP) Operations	BNCOC	AN	3-4
	101-92F-3315	Direct Assault Hoseline Operations	BNCOC	AN	3-4
	101-92F-3501	Direct the Advanced Aviation Forward Area Refueling System (AAFARS) Operations	BNCOC	AN	3-4
	101-92F-3502	Direct the Remote Refueling, Rearming, Deployable Distribution System (R3D2S) Operations	BNCOC	AN	3-4
	101-92F-3503	Direct the Load Handling Modular Fuel Farm (LMFF) Operations	BNCOC	AN	3-4
	101-92F-3504	Direct the Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem Operations	BNCOC	AN	3-4
12: DIRECTING PIPELINE OPERATIONS	101-92F-3201	Direct Petroleum Pipeline Pump Station Operations	BNCOC	AN	3-4
	101-92F-3309	Direct Installation of Petroleum Valves and Pipeline Sections	BNCOC	AN	3-4
	101-92F-3316	Direct Transfer Operations	BNCOC	AN	3-4

**CRITICAL TASKS LIST  
MOS TRAINING PLAN  
92F15**

**CRITICAL TASKS**

<i>Subject Area</i>	<i>Task Number</i>	<i>Title</i>	<i>Training Location</i>	<i>Sust Tng Freq</i>	<i>Sust Tng SL</i>
	101-92F-3505	Direct the Tactical Petroleum Terminal (TPT) Operations	BNCOC	AN	3-4
<b>Skill Level 4</b>					
13: CONTROL-LING GENERAL PETROLEUM OPERATIONS	101-92F-4261	Establish Petroleum Quality Surveillance Functions	ANCOC	AN	4
	101-92F-4281	Develop a Petroleum Environmental Stewardship Protection Program	ANCOC	AN	4
	101-92F-4311	Plan a Petroleum Fire Prevention and Safety Program	ANCOC	AN	4
	101-92F-4312	Manage Accountability of Petroleum Products	ANCOC	AN	4
	101-92F-4314	Plan Sling Load Operations	ANCOC	AN	4
14: CONTROL-LING TANK VEHICLES	101-92F-4302	Control ROM Site	ANCOC	AN	4
	101-92F-4305	Manage Petroleum Tank Vehicles Operations	ANCOC	AN	4
	101-92F-4307	Control Waterfront Operations	ANCOC	AN	4
	101-92F-4313	Control Unit Maintenance of Assigned Equipment Within The Army Maintenance Management System (TAMMS)	ANCOC	AN	4
15: CONTROL-LING CLASS III AND PIPE-LINE OPERATIONS	101-92F-4260	Determine Throughput Requirements for the Petroleum Pipeline	ANCOC	AN	4
	101-92F-4275	Perform the Duties of the Shift Dispatcher of the Pipeline Distribution System	ANCOC	AN	4
	101-92F-4310	Manage the Installation of Petroleum Pipeline Sections	ANCOC	AN	4
	101-92F-4316	Control Class III Supply Point Operations	ANCOC	AN	4
	101-92F-4400	Control the Tactical Petroleum Terminal (TPT) Operations	ANCOC	AN	4

**CRITICAL TASKS LIST  
MOS TRAINING PLAN  
92F15**

**CRITICAL TASKS**

<i>Subject Area</i>	<i>Task Number</i>	<i>Title</i>	<i>Training Location</i>	<i>Sust Tng Freq</i>	<i>Sust Tng SL</i>
<b>Skill Level 5</b>					
16: EVALUATING GENERAL PETROLEUM SUBJECTS AND TANK VEHICLES	101-92F-5201	Evaluate the Petroleum Environmental Stewardship Protection Program	UNIT	AN	5
	101-92F-5202	Evaluate Accountability and Quality Surveillance	UNIT	AN	5
	101-92F-5203	Plan Petroleum and Water Operations	UNIT	AN	5
17: EVALUATING CLASS III AND PIPE-LINE OPERATIONS	101-92F-5204	Plan for Class III Supply Point Operations	UNIT	AN	5
	101-92F-5205	Evaluate Petroleum Pipeline Operations	UNIT	AN	5

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## Chapter 3

# MOS/Skill Level Tasks

Skill Level 1

Subject Area 1: GENERAL PETROLEUM OPERATIONS

### Sling Load Packaged Petroleum Products

101-92F-1178

**Conditions:** Given the requirement to transport packaged petroleum products and 500-gallon collapsible drums by air. Personnel and materials required to perform task: three military occupational specialty (MOS)-qualified (92F) Soldiers to assist; MOS 93H or pathfinder that have required Air Traffic Control (ATC) skills; helicopter, risk management procedures, applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE) such as goggles, gloves, and hearing protection; 500-gallon collapsible drums; fuel source; package products; spill contingency equipment; fabricated static electricity discharge probe; clevis assembly; slings; tape; helmet; A-22 cargo bag; multiple leg sling; and full access to all reference materials. This task is performed under all environmental conditions, except during electrical storms.

**Standards:** Sling load packaged petroleum products and 500-gallon collapsible drums for external airlift using the A-22 cargo bag and the sling set without error, making sure the aircraft carrying capacity was not exceeded.

#### Performance Steps

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Wear appropriate PPE as required.

#### **DANGER**

**FAILURE TO PERFORM THE FOLLOWING TASKS  
CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT  
OR INJURY OR DEATH TO PERSONNEL.**

5. Rigging packaged petroleum products for external airlift using A-22 cargo bag.
  - a. Lay out A-22 cargo bag, cover centered with outside down on sling assembly.
  - b. Center load on canvas cover.
  - c. Fold panels of canvas over top of load.
  - d. Secure cover at each corner through lacing loops forming a figure eight with cord.

**Performance Steps**

- e. Secure ends of cord with a bow knot and tape.
- f. Pass free end of each tie down strap over top of load and across a strap fastener on opposite end of strap.
- g. Tighten strap and fold and tape excess webbing.
- h. Fasten lower lateral straps together around corners of load attaching free ends of straps to strap fastener.
- i. Fasten upper lateral straps together around corners of load attaching free ends of straps to strap fastener. For lower loads, fasten upper straps diagonally across top corners of load.
- j. Connect four snap fasteners on suspension webs of D rings onto support webs of sling assembly.
- k. Tape open side of snaps facing inward to D rings.
- l. Adjust all straps until sling assembly fits snugly around load and fold and tape excess webbing.
- m. Pull suspension webs to their full height when upper lateral straps run across top of load and secure so they do not bind upper part of support web to load.

6. Rigging 500-gallon collapsible drum for external airlift using sling set.

- a. Locate drum at rigging site.

NOTE: More than one drum can be airlifted with the multiple sling leg.

- b. Attach a small clevis assembly to lifting eye on each end of drum.
- c. Pass chain of one leg through clevis assembly of lifting eye on right end of drum.
- d. Hook a clevis assembly to end of chain and connect it to grab link.
- e. Pass chain of second leg through clevis assembly of lifting eye on left end of drum.
- f. Hook a clevis assembly to end of chain and connect it to grab link.
- g. Hook grab link to a 12-inch ring.

7. Hook cargo to helicopter.

- a. Direct helicopter to cargo using hand signals.
- b. Discharge static electricity from helicopter by using discharge probe.
- c. Hook a 12-inch ring from load to hook on helicopter.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—
5. Rigged packaged petroleum products for external airlift using A-22 cargo bag.	—	—
6. Rigged 500-gallon collapsible drum for external airlift using sling set.	—	—
7. Hooked cargo to helicopter.	—	—

**Evaluation Guidance:** NOTE: Check the containers for leaks or damage. Use spill contingency equipment as necessary. Report any spills to supervisor.

Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.



**References**

**Required**

FM 10-67-1

**Related**

FM 10-450-3

FM 10-450-4

FM 10-450-5

FM 3-04.111

FM 3-100.12

FM 3-100.4

## Identify Major Categories of Petroleum Products

101-92F-1308

**Conditions:** Given the requirement to identify major categories of petroleum products in a field environment. Materials required: petroleum products from four major categories: liquid propellants; fuel oils; oils or greases; and chemicals; risk management procedures; applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE); and full access to reference materials.

**Standards:** Identify major categories of petroleum products to ensure the products are received, categorized, stored, and issued to safely and properly meet the requirements of supported units.

### Performance Steps

#### **DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Identify automotive and aviation fuels (liquid propellants) category.

#### **CAUTION**

Wear appropriate PPE (such as face shield/goggles and chemical protective gloves) as identified in the applicable reference (MSDS).

- a. Specify different categories and types of automotive and aviation fuels.
  - (1) Automotive gasoline - Commercial type, Unleaded.
  - (2) Diesel fuel - DF-A, DF-1, and DF-2.
  - (3) Jet fuel - Jet A-1, JP-4, JP-5, and JP-8.

NOTE: JP-8 is also used in automotive applications.

- b. Use color and American Petroleum Institute (API) gravity test (see task 101-92F-1409) to determine type of fuel. Colors may vary from ones shown in Table 3-1 due to local dyeing procedures and fuel mixing.
- c. Report results to supervisor. If product cannot be identified, collect a sample for lab testing (see task 101-92F-1403).

**Performance Steps**

5. Identify burner fuels (fuel oils) category.
  - a. Define and specify grades of burner fuels.
    - (1) Burner fuel (fuel oil). Any liquid petroleum product burned for generation of heat in a furnace or firebox, or for generation of power in an engine, exclusive of oils with a flash point below 100 degrees Fahrenheit (F), and oils burned in wick burners.
    - (2) Burner fuel grades. Number 1, number 2, number 3, number 4, number 5 (light), number 5 (heavy), and number 6.

NOTE: Burner fuels are dark brown or black in color, API gravity range is 3.0 to 25.0.

- b. Conduct visual inspection and API gravity test (see tasks 101-92F-1403 and 101-92F-1409) on product.

NOTE: Burner fuels, grades one and two, are virtually indistinguishable from diesel fuels using these tests alone. Further lab tests are required to separate the two.

- c. Report results to supervisor. If product cannot be identified, collect a sample for lab testing (see task 101-92F-1403).

**Table 3-1. Characteristics of Fuel**

FUEL TYPE	COLOR	API GRAVITY
Automotive Gasoline (MOGAS) (Type I used above 0° F, Type II used below 32° F.)	Amber	55.1-31.4
Diesel Fuel (Procured in four grades: DF-1-winter-use to -25° F; DF-2-regular-use above 0° F; DF-A (Arctic)-use below -25° F; DF-M (Marine)-use in ships.)	Brown	34.0-37.0
Jet Fuels: Kerosene – based fuel		
JET A-1	Water White to Straw Yellow	
JP4	Water White to Straw Yellow	
JP5	Water White to Straw Yellow	
JP8	Water White to Straw Yellow	36.0-41.0

**Performance Steps**

6. Identify lubricants (oils and grease) category.
  - a. Define and specify categories of lubricants.
    - (1) Cutting oils. Oils used in metal cutting machinery to cool working piece and machinery, as well as wash away metal shavings.
    - (2) Hydraulic fluid. Fluid of petroleum or non-petroleum origin used in hydraulic systems.
    - (3) Greases. Mixtures of petroleum oil, soap (or other thickeners), and additives used for lubrication where oil would not be retained or meet other requirements. Typical examples are industrial general-purpose grease, automotive and artillery grease, and ball and roller bearing grease.
  - b. Identify lubricants primarily by package labels. If lubricant cannot be identified this way, submit container (or 1-gallon sample, whichever is smaller) to laboratory for identification (see task 101-92F-1403).

**Performance Steps**

7. Identify miscellaneous chemical specialties category.
  - a. Define miscellaneous chemical specialties. Miscellaneous chemical specialties are items that have a chemical base and are procured in relatively small quantities. Typical examples include dry cleaning solvent, paint thinner, and antifreeze.
  - b. Identify chemical specialty items primarily by package levels. If they cannot be identified this way, contact your supporting petroleum testing laboratory for guidance on identification procedures.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Identified automotive and aviation fuels (liquid propellants) category.	—	—
5. Identified burner fuels (fuel oils) category.	—	—
6. Identified lubricants (oils and grease) category.	—	—
7. Identified miscellaneous chemical specialties category.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**  
FM 10-67-1

**Related**  
FM 3-100.12  
FM 3-100.4

## Perform Firefighting Operations

### 101-92F-1309

**Conditions:** Given the requirement to use petroleum fire fighting equipment to contain or extinguish a fire in a field environment. The Soldier (assigned to a Class III Section) must use the proper petroleum fire fighting equipment to contain and extinguish the fire without causing further damage to the area or equipment or injury to personnel. Materials required to perform task: fire extinguishers; risk management procedures; applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE) such as gloves, faceshield/goggles, fire protection suits (coat, trousers, boots, hood, harness, and gloves); a Twin Agent Unit (TAU) with nitrogen containers; aqueous film forming foam (AFFF) solution; dry chemical; a simulated or actual controlled fire; Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required); Hazardous Material Information Sheets (HMIS); unit's tactical standing operating procedure (TSOP); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); and full access to all reference materials.

**NOTE:** If Soldier is to suppress a fire using the TAU, additional personnel or six military occupational specialty (MOS)-qualified 92F Soldiers will be required.

**Standards:** Use proper equipment and procedures to contain and extinguish the fire without causing further damage to the area or equipment or injury to personnel.

#### Performance Steps

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Wear appropriate PPE as required.

#### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Perform before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to appropriate technical manuals (TMs). Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.
6. Inspect fire extinguishers monthly to ensure they are in serviceable condition. Check for the following signs of unserviceability:
  - a. Check to ensure fire extinguisher is in proper location and it is accessible.
  - b. Check to see if there are dents, cracks, or excessive rust on the body.
  - c. Check hose to see if there is dry rot, cracks, or missing parts.
  - d. Check discharge horn to see if there are cracks, obstruction, or any grease and dirt accumulations.
  - e. Ensure safety seal is intact.

**Performance Steps**

- f. Ensure pressure gauge (if so equipped) is in "green" fully charged position.
- g. Ensure operating instructions are visible and readable.

NOTE: Halon is damaging to the environment. Its use is being phased out over the next few years in accordance with a presidential executive order. If you discover halon fire extinguishers, contact your environmental protection coordinator for further disposition instructions.

- 7. Turn in fire extinguishers in accordance with local procedures for repair and replacement as necessary.
- 8. Identify type of fire according to Table 3-2.

**Table 3-2. Classes and Types of Fire**

CLASSES	TYPES
A	Combustibles such as wood, brush, grass, and rubbish
B	Flammable liquids such as fuels, lubricants, and solids
C	Live electrical fires in motors and switches
D	Combustible metal (titanium, zirconium, sodium) fires

- 9. Identify the type of extinguisher to be used on the fire based on the type of fire (see Table 3-3).

**Table 3-3. Fire Extinguishers and Fire Classes**

TYPE OF EXTINGUISHER	EXTINGUISHES FIRE CLASS
Soda acid	A
Antifreeze (calcium chloride)	A
Loaded stream	A, B
Carbon dioxide	B, C, D
Dry chemical	B, C, D
Purple K	B,C

- 10. Use correct fire extinguishers and fire fighting procedures to extinguish a fire.

**CAUTION**

If protective equipment can be used and time allows, don the protective equipment before attempting to extinguish a fire.

- a. Sound alarm.
- b. Get help.
- c. Attempt to extinguish small fires with a fire extinguisher.
  - (1) Determine class of fire.

NOTE: Obey any warning signs posted in areas storing hazardous materials.

- (2) Select appropriate fire extinguisher.
- (3) Stand upwind of fire.
- (4) Point fire extinguisher nozzle at base of flames.
- (5) Move nozzle from side to side until fire is extinguished.
- d. Extinguish small fires with sand, wet burlap, or a blanket if fire extinguishers are not available.
- e. Use the following general principles to control and extinguish larger fires.
  - (1) Control fuel.
    - (a) Shut off fuel flow if possible.
    - (b) Control spread of fuel (use berms, do not use water and foam together).

**Performance Steps**

- (2) Control heat.
  - (a) If possible, use streams, sprays, or fogs of water to remove heat and vapors from air near fire.
  - (b) If possible, cool nearby petroleum storage tanks and immovable vehicles with water.
- (3) Control air flow to fire by diluting or smothering.
  - (a) Dilute oxygen in air near fire by using carbon dioxide, water fog, mist, or steam.
  - (b) Smother large fires with a layer of foam (this technique is particularly effective in storage tanks).

## 11. Prepare Twin Agent Unit (TAU).

NOTE: All dry chemical (purple K powder [PKP]) and AFFF system piping and components should be considered charged (under pressure) until the system is deactivated. Ensure that all systems are depressurized and cleared before uncoupling nozzles or hoses. Place protective covers on high pressure nitrogen cylinders prior to installing, removing, or transporting the cylinders. Should eyes become irritated by contact with either agent, flush immediately with clean, fresh water and seek medical aid. After spillage of either fire fighting agent, the area should be decontaminated immediately by flushing with water.

Caution must be taken when connecting or disconnecting the nitrogen cylinders as they are charged to 2,400 pounds per square inch (psi). The complete fire suit must be worn when fighting any large scale petroleum fire. Pressure relief holes are drilled in the threaded portion of each filler cap. If pressure is heard escaping through these holes while the cap is being removed, stop removal until all pressure has escaped. Fight the fire from the top of the berm, never go inside the berm. Never turn your back on the fire. If you must abandon the fire fighting effort, back away facing the fire. At least three personnel are required to operate the TAU. Wear a medically approved respirator when filling the PKP tank.

- a. Perform before-operations PMCS according to TM 10-4210-235-13, Chapter 2.
- b. Record any deficiencies on DA Form 2404 or DA Form 5988-E.
- c. Assemble and preparation of TAU.
  - (1) Assemble TAU.

**CAUTION**

Always fill the dry chemical tank first and ensure the dry chemical funnel is completely dry prior to use to ensure that no water is introduced into the tank. Any moisture in the dry chemical can cause it to clog due to caking.

- (a) The dry chemical tank is filled with 450 pounds of dry chemical prior to shipment. Check dry chemical for "caking".
- (b) Remove cap from dry chemical tank. Stir dry chemical to break up any lumps and loosen if it is packed for shipping.
- (c) Check dry chemical for hard lumps that would prevent system from operating. If lumps are found, remove one and drop it from a height of four inches onto a hard surface. If lump completely breaks apart, dry chemical is only packed from settling and is in satisfactory condition. If lump does not break apart completely, caking is present and dry chemical must be replaced.
- (d) Using dry chemical funnel, top off or refill dry chemical tank with dry chemical if needed according to TM 10-4210-235-13.
- (e) Replace cap and tighten hand tight.

## Performance Steps

### CAUTION

The foam liquid and water mixture is subject to freezing. If freezing weather conditions exist, do not service the AFFF tank until the power cord is connected to a power source.

- (f) Remove cap from AFFF tank.

### CAUTION

Be careful not to damage the AFFF tank lining with metal hose ends or connections. The lining can be scratched or scored resulting in corrosion of the AFFF tank. Foam liquid will freeze, but the plastic container(s) used for shipment will expand safely with the ice. The foam liquid can be used after it thaws.

- (g) Insert a hose against bottom of AFFF tank and add water to within nine inches (23 centimeters [cm]) of fill collar top. Pour in required amount of foam liquid according to TM 10-4210-235-13, Chapter 2, Table 2-3. Fill AFFF tank with water until foam liquid and water mixture is 4.5 inches (11.4 cm) from top of fill collar. No further mixing of solution is required after initial filling. Replace fill cap and tighten hand tight.
- (h) If freezing weather exist, or is expected, connect AFFF tank heater power cord to power source.
- (i) Check that system valves are in proper ready state position.
- AFFF AND DRY CHEMICAL VALVES SHOULD BE CLOSED.
  - PURGE VALVES SHOULD BE CLOSED.
  - CHARGE VALVES SHOULD BE OPENED.
  - NITROGEN CYLINDER VALVES SHOULD BE CLOSED.

### WARNING

**Special heat resistant clothing (including hood, coat, pants, gloves, and boots) must be worn while fighting any large scale petroleum fire. Injury to personnel can result if not properly protected. Burning hydrocarbons produces toxic smoke. Avoid smoke to prevent personal injury.**

- (2) Preparation of TAU.
- (a) Put on protective clothing.
- (b) Determine if auxiliary hose reel cart is needed.

NOTE: The fire suppression equipment trailer set holds 150 feet (46 meters) of twin agent hose assembly and the auxiliary mobile hose reel cart will give you a maximum reach of 300 feet (91 meters). Flow rate with 300 feet (91 meters) of hose will be reduced.

- (c) Check dry chemical powder for caking. It should crumble easily and pour freely between spread fingers. It should be within 4 inches of filler neck when full.
- (d) Check nitrogen cylinders for at least 1,750 psi (minimum required).
- (e) Check AFFF tank, solution should be within two inches of bottom of fill collar.



**Performance Steps**

- (f) Discharge nozzles should easily open and close with no binding.
- (g) Check valves for ready position.

## 12. Operate TAU during a fire.

- a. Connect remote hose reel if needed. Pull entire length of hose off reel on TAU. Remove nozzle assembly from first hose and connect remote hose to it. Attach nozzle assembly to remote hose reel.
- b. Open both nitrogen cylinders valves. The AFFF tank will take one to two seconds to pressurize, dry chemical tank should pressurize within ten seconds.
- c. Rotate dry chemical tank ball valve rod and AFFF tank ball valve rod to full open position. The system hose assemblies will pressurize up to fire hose nozzles.
- d. Remove lock pin and fire hose nozzles from nozzle bracket.
- e. Pull all hose assembly from drum.
- f. Approach fire from upwind. Lean toward fire and aim fire hose nozzles toward left side base of fire. Squeeze dry chemical fire hose valve lever (right hand) and apply dry chemical by sweeping across base of fire to right.
- g. Release dry chemical fire hose nozzle valve lever and squeeze AFFF fire hose nozzle valve lever (left hand) and apply AFFF by sweeping to left covering dry chemical.
- h. When headway is gained on fire, continue side by side sweeping across base of fire while alternating dry chemical (right hand, sweep right) and covering with AFFF (left hand, sweep left) until fire is extinguished.

NOTE: Continuous flow of fire fighting agents can only be maintained for less than two minutes.

- i. When area clears, extinguish any smoldering pockets that may re-ignite fuel.
- j. Engineer fire fighting detachment must verify that fire is totally extinguished.

**CAUTION**

Hose assembly clean out must take place immediately after tanks have been completely or partially discharged.

## 13. Returning TAU to operational ready status.

- a. Completely unwind hose assembly from drum. If auxiliary mobile hose reel cart was used, both hose assemblies must be unwound.
- b. Close dry chemical and AFFF tank ball valve rods.
- c. Remove retaining clips and close charge ball valves.
- d. Remove retaining clips and open both purge ball valves.
- e. Slowly squeeze fire hose nozzle valve levers one at a time until each hose is cleared. The fire hose nozzle should discharge gas only for ten seconds.
- f. Turn each nitrogen cylinder valve hand wheel fully counterclockwise (open). Lower quick release lever.
- g. Rotate cross shaft until flat is horizontal. Turn hand wheel fully clockwise (closed).
- h. Squeeze both fire hose nozzle valve levers to relieve system pressure.
- i. Remove wing nut and flat washer. Remove crank from storage position and place on rewind brake shaft.
- j. Using crank, wind hose assembly onto drum.
- k. Secure fire hose nozzle to nozzle bracket with lock pin.
- l. Secure crank to auxiliary mobile hose reel cart or trailer mounted extinguisher assembly with wing nut and flat washer.
- m. Notify unit maintenance for unit recharge if nitrogen cylinders are below 1,750 psi.
- n. Replenish agents as required by refill table.
- o. Perform after-operations PMCS according to TM 10-4210-235-13.
- p. Record any deficiencies of system on DA Form 2404 or DA Form 5988-E.
- q. Report any deficiencies to your supervisor.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—
5. Performed before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to appropriate technical manuals (TMs). Annotated any faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	—	—
6. Inspected fire extinguisher monthly to ensure they are in serviceable condition.	—	—
7. Turned in fire extinguisher in accordance with local procedures for repair and replacement as necessary.	—	—
8. Identified type of fire.	—	—
9. Identified type of extinguisher to be used on fire based on type of fire.	—	—
10. Used correct fire extinguishers and fire-fighting procedures to extinguish fire.	—	—
11. Prepared Twin Agent Unit (TAU).	—	—
12. Operated TAU during a fire.	—	—
13. Returned TAU to operational ready status.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 2404
- DA FORM 5988-E
- FM 10-67-1
- TM 10-4210-235-13

**Related**

- FM 3-100.12
- FM 3-100.4

## Sample Petroleum Products

### 101-92F-1403

**Conditions:** Given the requirement to perform physical tests on petroleum products in a field environment. Personnel and materials required to perform task: two military occupational specialty (MOS)-qualified (92F) Soldiers to assist: risk management procedures; applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE); a clear sample bottle; refueling tank vehicle (or other sample source); a drip pan or suitable container for waste fuel; a petroleum product sample for visual examination; petroleum storage containers/tanks with product weighted beaker; bacon bomb thief; 1-gallon sample can; fuel handler's gloves; pencil; DA Form 1804 (Petroleum Sample); sample cans/bottles; millipore sampling kit; clean paper towel and rags; aviation fuel in refueling vehicles/system; hydrometer; hydrometer cylinder; Aqua-Glo test kit; 1-quart clear sample bottles; and full access to all reference materials.

**Standards:** Visually examine the petroleum product sample to determine if water, sediment, or other contaminants are contained in the product. Report immediately to your supervisor the presence of any visual contaminant. Manually sample petroleum products, ensuring the samples are representative of the product in the storage container. Perform quality surveillance of aviation fuels before issuing, to ensure fuel quality meets aviation requirement for aircraft operations. Sample petroleum products for filter effectiveness to ensure only on specification, clean fuel is available for use in appropriate equipment.

#### Performance Steps

### DANGER

### DO NOT PERFORM THIS TASK DURING ELECTRICAL STORMS.

Failure to perform this task correctly may result in damage to equipment or injury or death to personnel. It is imperative that personnel conducting sampling procedures maintain bonding with tank at all times especially during cold weather. When gloves are worn in cold weather, it is recommended that a metal button be inserted in the palm of the gloves so that contact can be made between the hand and the steel tank. Also, ensure contact between the gauging tape and hatch is maintained from the moment the gauge bob enters the hatch until at least such time as the bob enters the product. If fuel is under pressure, obtain pressure reading. Be sure that the pressure does not exceed 100 pounds per square inch (psi) to avoid excessive pressure and damage to fuel lines.

**NOTE:** In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor. Wear the appropriate PPE such as face shield/goggles and chemical protective gloves, as identified in the applicable reference MSDS.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.

**Performance Steps**

3. Read and understand unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Wear appropriate PPE as required.

**CAUTION**

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Visually examine petroleum products for water or sediment contamination.
  - a. Gather equipment.
    - (1) Obtain a clean, clear sample bottle (1 pint or larger).
    - (2) Obtain a container of sufficient size to hold fuel used to flush sampling outlet and several gallons of product used to flush system and for spilled fuel from sampling process.
  - b. Flush sample source outlet with product to free it of contaminants.
    - (1) Place a container under sample source outlet to catch product.

**WARNING**

**DO NOT DUMP PRODUCT ON THE GROUND!**

- (2) Flush sample source with fuel by opening it to full flow and allowing fuel to run through it into drip pan for several seconds or until operator is confident sample source is free flowing and clear of contamination.
  - c. Rinse sample bottle with sample product.
    - (1) Fill sample bottle approximately 75 to 80 percent full with product.
    - (2) Cap bottle and swirl product around to remove any residual dirt, water, and other contaminants.
    - (3) Dispose of product (back into the fuel source if feasible and allowable, into waste fuel container or in accordance with local SOP).

**WARNING**

**DO NOT DUMP PRODUCT ON THE GROUND!**

- (4) Close sample source.
    - d. Obtain product sample.
      - (1) Ensure drip pan or other catch basin is in place under sample source.
      - (2) Open sample source and allow product to flow into sample container as quickly as possible at full flow. Protect sample at all times from rain, dust, dirt, and other contamination.
      - (3) Fill sample bottle no higher than about 3/4 full (70 to 80 percent).
    - e. Observe product for color according to FM 10-67-1, Chapter 8 and as shown in Table 3-4. Local colors may vary from general guidelines due to local fuel dyeing procedures.

**Performance Steps**

- f. Observe product for water and sediment.
  - (1) Swirl sample so that it forms a "whirlpool".
  - (2) Look for dark particles (sediment) and light colored globules of liquid (water) collecting near the base of the whirlpool.
- g. Report color changes or incorrect colors, water, and sediment contamination to your supervisor.
- h. Dispose of waste fuel in an environmentally safe method in accordance with local operating procedures.
- i. Recheck site for spills. Clean up any spills and report them to your supervisor.

**Table 3-4. Petroleum Colors and Products**

PRODUCT COLOR	PRODUCT
Water White to Straw Yellow	100/130 or 115/145 AVGAS
Amber	80/87 AVGAS or MOGAS
Water white to Straw Yellow	Jet fuels, kerosene, benzene, naphtha, solvents, unleaded gasoline
Brown	Diesel fuel
Dark Brown or Black	Burner fuel

## 6. Manually sample petroleum products.

- a. Determine number and type of samples to be taken as directed by supervisor.

NOTE: This task will require an all-levels sample using a weighted beaker and a bottom sample using a Bacon bomb thief.

- b. Collect sampling equipment.
  - (1) Obtain an appropriate number of clean 1-gallon metal sampling containers.
  - (2) Obtain serviceable sampling equipment (weighted beaker, weighted bottle, drum thief, Bacon bomb thief, vacuum-pump sampler, or other suitable sample devices which are clean and will not contaminate the sample).
  - (3) Obtain an appropriate number of DA Forms 1804.
  - (4) Obtain a pencil to mark DA Form 1804. Do not use a pen because ink will run if fuel is spilled on tag.
  - (5) Obtain appropriate cleanup absorbents.
  - (6) Obtain appropriate PPE.
- c. Obtain an all levels sample using a weighted beaker.
  - (1) Ground yourself by touching your bare hand to bulk storage container you are handling.
  - (2) Open gauging hatch with wind at your back.
  - (3) Rinse weighted beaker with product in bulk storage container. Pour contents back into bulk storage container.
  - (4) Rinse sample container with product in bulk storage container. Pour contents back into bulk storage container.
  - (5) Insert cork into beaker.
  - (6) Lower beaker as close as possible to bottom of bulk storage container.
  - (7) Jerk drop cord to release cork from beaker.
  - (8) Raise beaker at such a rate that it is between 75 to 85 percent full when it comes out of bulk storage container.
  - (9) Transfer contents to sample container.
  - (10) Repeat procedures (5) through (9) until sample container is 70 to 80 percent full.
  - (11) Close sample container tightly.
  - (12) Dispose of used cleanup material properly according to local SOPs and environmental regulations.
- d. Obtain a bottom sample using Bacon bomb thief.
  - (1) Rinse sample container with product in bulk storage container.
  - (2) Lower Bacon bomb thief into bulk storage container until plunger touches bottom.

**Performance Steps**

- (3) Allow Bacon bomb thief to fill.
- (4) Pull Bacon bomb thief out of bulk storage container.
- (5) Transfer contents of sampler to sample container.
- (6) Repeat procedures in subparagraph c(5) through (9) until the sample container is 70 to 80 percent full.
- (7) Close sample container tightly.
- e. Prepare DA Form 1804 in accordance with FM 10-67-1, Chapter 3, for samples.
  - (1) Use pencil to fill in data items (or type them) according to Table 3-5. Do not use a pen because ink will run if fuel is spilled on tag.
  - (2) Attach tags securely to sample cans.
- f. Transport samples to laboratory for testing.

**Table 3-5. Data Entries**

TAG SECTION	ENTRY
Product	Product specification nomenclature
From (Installation)	Name of installation submitting sample
Sample No.	Applicable sample identification number
Laboratory No.	Reserved for use by testing lab
Specification No.	Product specification number
Amount Product Sample Represents	Gallons of product in storage container (storage tank, tank truck, rail car)
Manufacturer/Supplier	Name of company that supplied product
Sample Source	Truck number, tank number, or other identification number for source of sample
Sampled By	Signature of sampler
Armed Services Procurement No.	Applicable contract number
Stock No.	National stock number of product
Date Sampled	Date sample was taken.
Qualification No.	Special qualification number (if applicable)
Batch No.	Applicable batch number
Fill Date	Date container was filled (applies to cases, cans, pails, and drums only)
Shipment Delivery Date	Date delivery shipment was made
Contract Bulletin No.	Applicable DFSC contract bulletin number (if any)
Item No.	Applicable DFSC contract number (if any)
Program	Place an X in the appropriate box
Type Sample	Place an X in the applicable box
Reverse Side of Tag	Weather conditions and any other remarks necessary to aid analysis of the sample; telephone number, address, and name of person to contact for additional sample information.

- 7. Perform quality surveillance of aviation fuels.
  - a. Collect materials for an American Petroleum Institute (API) gravity test (ASTM TABLE 5 B, one gallon of petroleum sample, one thermo-hydrometer in API gravity range of product being tested, one empty gallon can for waste, rags, graduated cylinder) visual inspection, and an Aqua-Glo test (Aqua-Glo test kit, fuel probe, and paper towels).
  - b. Prepare Aqua-Glo test kit for testing according to FM 10-67-1, Chapter 13 and Appendix E.
    - (1) Put a fully charged battery into meter assembly.
    - (2) Use tweezers to insert recalibration pad into test pad slot with colored side in toward lamp.
    - (3) Slide meter assembly into ultraviolet lamp assembly.

**Performance Steps**

- (4) Recalibrate meter assembly:
  - (a) Turn lamp on by pushing lamp switch to ON and holding for eight seconds. Unit should emit a tone which changes from a high pitch to a low pitch. If a tone is not emitted, battery needs to be recharged. If battery indicator light is on, turn unit off immediately and get a charged battery.
  - (b) If meter pointer does not point to zero, adjust meter until it does by turning recalibration screw in side of detector (after removing plug screw).
  - (c) Move lever on lamp assembly to SET number indicated on test pad. Hold hooded meter switch button in until pointer on meter scale becomes steady.
  - (d) Take recalibration pad out of test pad slot and store it.
  - (e) Wipe green glass light filters off with a clean soft cloth or paper towel.
- c. Recirculate a minimum of 300 gallons of fuel through refueler filter separator.
- d. Take a preoperational sample from refueler.
  - (1) Place pump on refueler in operation and open at least one nozzle.
  - (2) Collect a sample for API gravity test and visual inspection.
  - (3) Conduct a visual inspection.
    - (a) Check for type of fuel.
    - (b) Check product for correct color.
    - (c) Check appearance for clear, clean, and bright product.
  - (4) Conduct an API gravity test according to task 101-92F-1409.
- e. Conduct an Aqua-Glo test on product.

NOTE: Test must be made on a moving stream of fuel, with the system pump operational and at least one nozzle open.

- (1) Couple detector pad holder assembly, with toggle valve closed (parallel to line), to refueler sampling coupler.
- (2) Flush detector assembly:
  - (a) Put the end of tubing into a 1-gallon container (minimum).
  - (b) Open toggle valve.
  - (c) Let approximately one gallon of fuel flow through assembly.
  - (d) Shut toggle valve and uncouple detector pad assembly.
- (3) Use tweezers to insert a detector pad (yellow side out) into detector pad holder.
- (4) Couple detector pad holder to sampling coupler, with toggle valve closed, and put end of tubing into plastic sample bottle.
- (5) Open valve and let 500 milliliters of fuel flow into sample bottle. Close valve.
- (6) Uncouple detector pad holder and remove test pad from holder.
- (7) Press test pad between paper towels or blotters to remove excess fuel.
- (8) Test fuel.
  - (a) Put test pad in test pad slot in the bottom of lamp assembly (yellow side facing lamp).
  - (b) Turn lamp on.
  - (c) Push in hooded button with left hand. Move lever of lamp assembly with right hand until meter pointer points to zero.
  - (d) Release pressure on button and shut off lamp switch as meter pointer reaches zero. Allow meter pointer to stabilize.
  - (e) Take reading from scale behind lever. If reading is 10 parts per million (PPM) or below, test is finished and fuel may be used. If reading is 10 PPM and meter pointer will not point to zero, follow steps described below:
    - 1 - Repeat performance measure 2d(1) through (4).
    - 2 - Open the toggle valve and let 100 milliliters of fuel flow into the sample bottle.
    - 3 - Repeat steps (7) and (8) (a) through (d).
    - 4 - Read the scale and multiply by five to get PPM of water.
    - 5 - Take the fuel and the fueler out of service immediately if fuel on the retest shows more than 10 PPM of water.
  - (f) Report all test results to your supervisor.

**Performance Steps**

8. Sample petroleum products for filter effectiveness.
  - a. Collect sampling equipment.
    - (1) Collect sample cans or bottles.
    - (2) Collect fuel (millipore) sampling kit components.
  - b. Inspect sample cans or bottles to ensure they are clean.
  - c. Assemble or prepare millipore sampling kit.
  - d. Recirculate fuel in tank vehicle/system three to five minutes minimum.
  - e. Take a sample of product every 30 days and after changing tank vehicle/system filter elements.
  - f. Take a 1-gallon sample from nozzle with pump running after recirculation for a laboratory millipore test.
  - g. Take a sample with millipore sampling kit.
  - h. Attach a filled out DA Form 1804 to the 1-gallon nozzle sample container and to plastic monitor.
  - i. Submit samples to supporting laboratory for processing.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—
5. Visually examined petroleum products for water or sediment contamination.	—	—
6. Manually sampled petroleum products.	—	—
7. Performed quality surveillance of aviation fuels.	—	—
8. Sampled petroleum products for filter effectiveness.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**  
 FM 10-67-1  
 TM 5-6630-218-10

**Related**  
 AR 200-1  
 AR 710-2  
 FM 3-100.12  
 FM 3-100.4



## Convert Measured Quantity of Fuel to Net Quantity at 60 Degrees Fahrenheit

### 101-92F-1409

**Conditions:** Given the requirement to convert measured quantity to net quantity of petroleum product at 60 degrees Fahrenheit (F) in a field environment. The Soldier (assigned to a petroleum element) must measure the American Petroleum Institute (API) gravity of a petroleum product by obtaining results that are within .01 API degrees of the known API gravity. Materials required to perform task: risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE), a petroleum sample, hydrometer cylinder, set of thermo hydrometers (hydrometers with integral thermometers), level work surface, rags, filter paper, American Standard of Testing Materials (ASTM) test method for API gravity, ASTM/API/Institute of Petroleum (IP) Table 5B, pencil, paper, ASTM/API/IP Table 6B, temperature of petroleum product, corrected API gravity of product, total measured quantity of product minus bottom sediment and water (BSW), DA Form 3853-1 (Innage Gage Sheet (Using Innage Tape and Bob)), and full access to reference materials.

**Standards:** Measure the API gravity of a petroleum product by obtaining results that are within .01 API degrees of the known API gravity. Convert measured quantity to net quantity of petroleum product at 60 degrees F.

#### Performance Steps

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Wear appropriate PPE as required.

#### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Prepare sample.
  - a. Shake sample container to thoroughly mix contents.
  - b. Pour sample into a clean, dry hydrometer cylinder until it is approximately 3/4 full.
  - c. Allow any air bubbles to rise to surface and remove them by taping top of cylinder with palm of hand or dabbing area with filter paper.
6. Prepare and select equipment.
  - a. Select thermo hydrometer with closest API gravity range of fuel being tested.
  - b. Inspect hydrometer for damage and ensure mercury column of thermometer has no separation. If there is damage or mercury separation, choose another thermo hydrometer.
7. Perform API measurement.
  - a. Lower hydrometer gently into sample and stir sample by raising and lowering hydrometer.
  - b. Observe movement of mercury in thermometer. Take temperature reading when mercury stops moving and record it on a piece of paper.

**Performance Steps**

c. Give hydrometer a slight spin and allow it to come to rest without touching side of cylinder.

NOTE: If the hydrometer moves to the side, move it back to the center of the liquid and spin it gently again. To avoid an incorrect reading, do not allow the stem of the hydrometer to become wet with liquid above the expected API reading.

d. Wait until hydrometer is floating freely, read to nearest scale division at point where bottom of meniscus cuts hydrometer scale, and record observed API gravity. If hydrometer scale sinks below top scale division or floats with scale out of product, select another hydrometer within a different range.

NOTE: When the same operator on the same sample performs two API gravity test, the results must be within 0.2 degree API of each other.

e. Stir sample again with hydrometer and observe temperature. Read and record temperature before and after taking your observed API gravity. Both readings must be within (+-) 1 degree F. If not, read hydrometer scale and temperature as above, until both are the same.

f. Correct observed API gravity to 60 degrees F using ASTM/AP/IP Table 5B.

NOTE: ASTM Table 5B is written in half degree numbers. Therefore, when correcting the observed API, the decimal is rounded to the nearest half degree numbers. Use the following rounding rules: if the decimal is .1 or .2, round down to whole number, if the decimal is .3, .4, .6, or .7 round to .5, if the decimal is .8 or .9 round up to the whole number.

g. Round off and record corrected API gravity to nearest .01 degree API gravity.

8. Convert measured quantity to net quantity of product at 60 degrees F.

NOTE: If product temperature does not equal 60 degrees F, correct quantity on hand figure.

a. Determine a product API at 60 degrees F from Table 5B in the ASTM/API/IP using observed API and temperature.

b. Determine volume conversion factor from Table 6B in ASTM/API/IP using API at 60 degrees F and observed temperature.

c. Multiply volume conversion factor by observed quantity to get quantity of fuel at 60 degrees F.

9. Record corrected volume of product on DA Form 3853-1 and other accountability forms according to task 101-92F-1311.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—
5. Prepared sample.	—	—
6. Prepared and selected equipment.	—	—
7. Performed API measurement.	—	—
8. Converted measured quantity to net quantity of product at 60 degrees F.	—	—
9. Recorded corrected volume of product on DA Form 3853-1 and other accountability forms according to task 101-92F-1311.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

ASTM STANDARDS  
DA FORM 3853-1  
FM 10-67-1

**Related**

FM 3-100.12  
FM 3-100.4

## Prepare Accountability Forms for Petroleum Products

101-92F-1412

**Conditions:** Given the requirement to account for daily issues and receipts of petroleum products on DA Form 3643 (Daily Issues of Petroleum Products), DA Form 2765-1 (Request for Issues or Turn-in), and DD Form 1898 (Fuel Sales Slip) in a garrison/field environment. Materials required: risk management procedures, petroleum products, pen, DA Form 3643, DA Form 2765-1, DD Form 1898 and full access to reference materials.

**Standards:** Fill out DA Form 3643, DA Form 2765-1, and DD Form 1898 with required information; ensuring that all personnel receiving fuel sign in the appropriate block and complete the form before the receipt/issue vehicle or aircraft departs the area.

### Performance Steps

1. Prepare DA Form 3643.
  - a. Fill in all blocks in heading section.
    - (1) Enter page number in Page No. block.
    - (2) Enter number of pages used for day in No. of Pages block.
    - (3) Write in unit of measure by words "issues" and "receipts" in heading.
    - (4) Enter type of fuel being issued or received in each of three blocks under issues and receipts (blocks b, c, and d for issues and blocks of e, f, and g for receipts).
  - b. Enter United States Army (USA) registration number from vehicle in Vehicle USA Registration Number box for retail issues. For bulk issue/receipts, enter document number.
  - c. Enter number of gallons/other unit of issue/receipt in correct column of Type, Grade, and Unit of Issue box for each product issued/received.
  - d. Enter organization and address of person receiving product in Organization and Address block (not required of bulk receipts from your support organization).
  - e. Direct operator of refueled vehicle or agent of supported unit to enter his/her signature and rank in Signature Grade block.
  - f. Sign for all receipts in signature block.
  - g. Total all entries for each type of product issued/received for the day (if required by local standing operating procedure [SOP]), and enter the total in the appropriate column.
  - h. Fill in blocks at bottom of form and forward it to supervisor.
    - (1) Post, Camp, or Station. Enter name of post, camp, or station where issues and receipts took place.
    - (2) Date: Enter actual date for receipts and issues and receipts and issues carried over.

2. Prepare DA Form 2765-1.

NOTE: The customer (you) will use this form to request packaged and bulk fuel products to be delivered by tank trucks and semi-trailers. It may also be used for turn-in, but that function will be trained at the unit level.

- a. In Block "a" the address of the location to receive this request. This is usually your support unit.
- b. In Block "b" you will place your unit address.
- c. In the Block "stock number" 4 thru 6 you will place the 13 digit number NSN (Federal Supply Catalog National Stock Number). This is most commonly called the NIIN number. Each item supplied by the military will have one of these numbers.
- d. In the unit of issue #7 you will place the unit of issue you are requesting in "gal" or "qt".
- e. In The quantity Block #8 you will place the quantity of the item you are requesting. Use only one Block per character.
- f. In the Cost Detail Account Number block L you will place your unit's cost accounting number. Your unit will supply this.

**Performance Steps**

- g. In the Unit Price Block M you will place the cost per unit of the item you are requesting. For example, if you are requesting JP/8 and the cost is \$1.42 cents per gallon, you will place "\$1.42" in this Block.
- h. In the Block O marked "item description" you will place the description of the item you are ordering such as JP 8.
- i. The Block P marked "Publication Data" will also be supplied by your unit supply or Bn S-4.
- j. When receiving the product you requested, an issued amount will be marked in the issued Block Q by issuing personnel.
- k. When receiving the product you requested, you will also mark the quantity received in the Received Block. This quantity must match the quantity issued Block.
- l. The Block marked "signature" you must also mark the Julian date received and place your signature in the Block marked "signature". You are verifying that the amounts issued and received are the same and that the product you received is the product you ordered. The copy of the DA Form 2765-1 will be turned in to your supervisor or the designated accountable officer when you turn in the DA Form 3643.

## 3. Prepare DD Form 1898.

NOTE: DD Form 1898. (Fuel Sales Slip). Many of you who will be assigned to aviation units will see these forms. Use DD Form 1898 as the basic issue document for all aviation products issued to any aircraft at Army airfields other than home stations, Navy and Air Force installations. Obtain DD Form 1898 through normal publication supply channels. The pilot or authorized representative ensures that product services are recorded on DD Form 1898. In most cases, DD Form 1898 was already filled-out with other supporting document and carried by aircraft personnel/pilot.

- a. In the block marked "fuel grade" you will place the description of the item you are refueling or defueling such as JP 8.
- b. Enter vehicle bumper number on "Vehicle No." block or record aircraft type and tail or serial number.
- c. Enter United States Army (USA) registration number from vehicle in Vehicle USA Registration Number or Tail/Serial number of an aircraft.
- d. In The Quantity block, you will place the quantity of the item you are refueling or defueling.
- e. In the Measure of Unit, it can be by "pound", "gallon" or "quart".
- f. In the Unit Price block, you will place the cost per unit of the item you are requesting. For example, if you are requesting JP/8 and the cost is \$1.42 cents per gallon, you will place "\$1.42" in this Block.
- g. Service Location and Nation. Enter name of post, camp, or station and nation where issues and receipts took place.
- h. Calculate Total Price block based on unit price per gallon of petroleum product.
- i. When issuing the product requested, you will mark the "Refuel" block and "Defuel" block if you received fuel from aircraft.
- j. Select "Method of Payment" and mark the appropriate block. It can be either "Reimbursement" or Replacement In Kind".
- k. Enter organization/billing address and records aircraft type and tail or serial number in "Billing Address and Aircraft Information" block (for cash sales-write "CASH").
- l. Annotate any remarks and/or Voucher No. in relation to refueling or defueling transactions.
- m. Director of Logistic and Accountant name of unit refueling/defueling and the date it is issue should be annotated on the form.
- n. Person issuing the petroleum product should sign on the "Issued By" block.
- o. Request aircraft pilot of supported unit to enter his/her signature and print name and rank in DD Form 1898.
- p. Disposition of the four part DD Form 1898
  - (1) Forward original to finance and accounting office of issuing activity for billing and collection purposes.
  - (2) Retain copy 2 for property accountability at the issuing activity.

**Performance Steps**

- (3) Present copies 3 and 4 to the pilot or aircraft commander requesting refueling. The pilot keeps copy 3 and forwards copy 4 to his finance and accounting office.
- 4. Turn-in copies of completed accountability forms to supervisor daily.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Prepared DA Form 3643.	—	—
2. Prepared DA Form 2765-1.	—	—
3. Prepared DD Form 1898.	—	—
4. Turned-in completed daily accountability forms to supervisor.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 3643
- DA PAM 710-2-1
- FM 10-67-1

**Related**

- DA PAM 710-2-2

## Employ Environmental Stewardship Protection Program Measures

### 101-92F-1413

**Conditions:** Given the requirement to handle any hazardous material (HM) or hazardous waste (HW) or other material which might generate HW in a field environment. Personnel and materials required to perform task: all personnel; risk management procedures; applicable Material Safety Data Sheets (MSDS); drip pans or similar initial containment devices; personal protective equipment (PPE) such as hearing and eye protection gloves; protective clothing and kevlar; spill kit; absorbent materials; rags; approved accumulation containers for contaminated soil/absorbent material/debris/hazardous fluids; Facility Response Plan (FRP); Spill Prevention Response Plan (SPRP); Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required); the unit HW/HM management policy; unit standing operating procedure (SOP); Hazardous Material Identification System (HMIS); and full access to all reference materials.

**Standards:** Handle and dispose of all HW in a manner which has no detrimental effect on the environment. Adhere to MSDS for material being handled. Comply with unit SOP/operations order (OPORD) on spill removal and disposal requirements for HM/HW.

#### Performance Steps

### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Adhere to appropriate MSDS.
  - a. Identify potential environmental hazards.
  - b. Extract information from MSDS.
  - c. Determine safety measures from MSDS.
3. Read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Wear appropriate PPE as required.

### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Comply with environmental law and local procedures for environmental protection.
  - a. As part of unit in processing, read unit environmental SOPs. Be alert for local laws which are different than those you are used to.

### Performance Steps

- b. Prevent environmental damage and pollution by applying environmental awareness to daily activities.
- c. Advise the chain of command on techniques to ensure compliance with environmental regulatory requirements.
- d. Identify the environmental risks associated with individual and team tasks.
- e. Support the Army's recycling program.
- f. Report HM and waste spills immediately.
- g. Make sound environmental decisions in the absence of a supervisor or proper guidance by reviewing the following:
  - (1) Training.
  - (2) Guidance from the chain of command.
  - (3) Concept of right and wrong.

6. Maintain a clean and safe work area.

**CAUTION**

Gloves and goggles/face shield need to be worn when performing any fuel operation.

- a. Clean as you go to minimize spread of hazardous wastes.
- b. Dispose of hazardous wastes and related contaminated materials (rags) according to local procedures in an environmentally safe manner. Do not throw hazardous materials in the trash or down the drain.

7. Prevent spills of hazardous substances.

- a. Inspect petroleum transfer equipment (hoses, storage tanks) prior to operation for serviceability. Check all connections for tightness.
- b. Continually observe hoses, connections, valves, and other equipment during petroleum transfer operations for initial signs of leakage. Stop operations immediately when a leak is detected and repair it.
- c. Use drip pans under all nozzles and hose connections on petroleum equipment.
- d. Store waste products in clearly marked, sealable, leak free containers. Containers should be as small as possible to minimize size of leaks (for example, do not use 600-gallon containers to store waste oil if smaller 50-gallon containers are available and can be emptied often enough to support the mission).

8. Follow correct procedures for responding to spills.

- a. Before beginning any operations involving petroleum products, have on hand equipment to contain and clean up spills. This includes items such as drip pans, sufficient size containers to hold any waste fuel generated, absorbents, adsorbents, and dispersants, shovels to dig up contaminated soil, containers to hold contaminated soil and other contaminated materials, fuel containment booms for waterborne spills, skimming boats, and barges for waterborne spills.
- b. Cease operations immediately when a spill occurs.
- c. Take steps to minimize further spillage. Close valves on petroleum hoses and pipelines, plug containers that are leaking, return them to their upright position, and put in place containment booms to contain waterborne spills.
- d. Begin cleanup immediately.
  - (1) Apply absorbent to land based spills.
  - (2) Use appropriate available measures to remove waterborne spills.
    - (a) Determine cleanup method to be used on waterborne spills by the type of product, where the spill occurs, weather conditions, and other special considerations (closeness to drinking water sources, fishing grounds, wildlife habitats, bathing beaches, and recreational areas).
    - (b) Contain the spill using floating booms, if available.



**Performance Steps**

- (c) Remove as much of the spill as possible using a skimming boat or barge, if available.
  - (d) Remove the remaining product using Environmental Protection Agency (EPA) approved absorbents, adsorbents, and chemical dispersants.
  - (3) Collect and turn in contaminated soil and absorbents in approved containers according to local policies.
  - e. Conduct repairs or otherwise correct the problem that caused the spill.
  - f. Report a spill to the chain of command and local environmental coordinator.
9. Use all safety equipment required by local policy or law when handling hazardous materials and waste.
    - a. Examine MSDS to determine specific hazards associated with hazardous materials.
    - b. Identify local policies on the appropriate safety equipment for counteracting health hazards associated with hazardous materials.
  10. Select correct handling procedures for materials and wastes.
    - a. Consult MSDS for specific guidance on handling hazardous materials.
    - b. Know local SOPs for handling hazardous materials.
  11. Report spills and other violations per local Installation Spill Control Plan (ISCP) and SCCP.
  12. Properly turn in hazardous substances per local operating procedures.
    - a. Consult unit HM lists and MSDS to determine if a material is hazardous and to determine any special handling requirements.
    - b. Ensure hazardous substances are in durable, leak proof containers and are appropriate for the type of HM.
    - c. Ensure containers are labeled according to local SOPs.
    - d. Contact Supply Support Activity (SSA) for turn in procedures.
    - e. Transport substances to a point according to HM transporting procedures as outlined in the unit SOP.
  13. Conserve resources.
    - a. Recover useable items. Recycle and reuse them whenever possible.
    - b. Do not stockpile items, particularly HMs. Order only what is needed.
    - c. Use non-hazardous substitutes for items whenever possible.
    - d. Do not use and reuse natural resources until they become unserviceable. Examples include using camouflage nets instead of tree branches to camouflage vehicles, conducting cross-country marches along varying routes to preserve the land, and practicing water crossing techniques on dry land prior to crossing the actual water crossing site.
    - e. Consolidate potentially environmental damaging activities in one location to minimize damage. An example is changing vehicle oil on a fleet of vehicles in one spot.

**Evaluation Preparation:** See task Conditions and Standards.

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
1. Applied risk management procedures.	—	—
2. Adhered to appropriate MSDS.	—	—
3. Read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—
5. Complied with environmental law and local procedures for environmental protection.	—	—
6. Maintained a clean and safe work area.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
7. Prevented spills of hazardous substances.	—	—
8. Followed correct procedures for responding to spills.	—	—
9. Used all safety equipment required by local policy or law when handling hazardous materials and waste.	—	—
10. Selected correct handling procedures for materials and wastes.	—	—
11. Reported spills and other violations per local ISCP and SCCP.	—	—
12. Properly turned in hazardous substances per local operating procedures.	—	—
13. Conserved resources.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**  
FM 10-67-1

**Related**  
AR 200-1  
FM 3-100.12  
FM 3-100.4

## Subject Area 2: TANK VEHICLES

**Perform Petroleum Railcar Operations****101-92F-1207**

**Conditions:** Given the requirement to load and unload petroleum products from rail tank cars in a field environment. The Soldier (assigned to a Class III Section) must load and unload petroleum rail tank cars without injury to personnel, damage to equipment, or pollution of the environment. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers to assist; loading facility; pump; gossler coupling; fire extinguishers; spill kit/containers; unit standing operating procedure (SOP) on fueling operations; risk management procedures; applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE) such as hearing, eye protection, and gloves; Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required); and full access to all applicable reference materials.

**Standards:** Load and unload petroleum rail tank cars without injury to personnel, damage to equipment, or pollution of the environment.

**Performance Steps****DANGER**

**DO NOT PERFORM THIS TASK DURING ELECTRICAL STORMS (WITHIN A 3 MILE RADIUS). FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

**CAUTION**

Before performing this task, read and comply with the appropriate MSDS.

**NOTE:** In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements before performing the task to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor.

Loading rail tank car:

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.

### Performance Steps

2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
  3. Read and understand unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
  4. Wear appropriate PPE as required.
  5. Perform before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to appropriate technical manuals (TMs). Annotate on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)) any faults found while performing PMCS.
  6. Perform preliminary procedures for loading rail tank car.
    - a. Sample and gauge product that will be transferred to tank car.
      - (1) Take American Petroleum Institute (API) gravity (see task 101-92F-1409) and temperature of product.
      - (2) Visually inspect product for color and appearance (see task 101-92F-1403).
      - (3) Correct volume for 60 degrees F temperature (see task 101-92F-1409).
      - (4) Record volume on accountability and shipping documents according to DA Pamphlet 710-2-2. Provide data to your supervisor.
    - b. Perform PMCS on loading equipment (such as pumps, hoses, pipeline, and manifolds).
- NOTE: Place pumping unit at least 50 feet from the tank car.
- c. Attach grounding cables between track rails to grounding post/rod. Make sure cable connections are secure and make metal-to-metal contact.
  - d. Position tank car so that there will be no unnecessary strain on hose connections.
  - e. Attach a grounding cable from rack to tank car. Make sure cable connections are secure and make metal-to-metal contact.
  - f. Set brakes and block wheels of tank car to keep it from moving during loading/unloading operations.
  - g. Set and lock derails.
  - h. Place signs reading "STOP TANK CAR CONNECTED" between cars at least 25 feet (50 is better) ahead and behind tank cars. Place signs where they can be seen by switch crews.
  - i. Place at least two fire extinguishers near rail tank car within easy reach of operators.
  - j. Check rail tank car to ensure it is free of contamination and in good operating condition.
- NOTE: If a tank car manifold is used, bond to tank shell.
- k. If other cars will be using site, attach derails at head of siding or bypass to prevent other cars from backing into rail tank car during transfer operations.
  - l. Check that rail tank car and all major components in supply point are bonded and grounded.
  - m. Place NO SMOKING signs in area where they can be easily seen.
  - n. Check hoses and fittings to be used in operation for serviceability. Replace hoses and fittings which have potential to cause a leak.
- CAUTION**

Wear appropriate PPE (such as face shield/goggles and chemical protective gloves) as identified in the applicable reference (MSDS).
- o. Ground yourself by placing hand on tank or holding rack ladder.
- NOTE: In the event of extreme cold weather, use a grounding rod to bond yourself to the rail car.
- p. Raise the safety valve to release internal pressure. If you have a tank car with a screw-type cover, place a bar between the cover lug and dome knob and unscrew the cover two complete turns or until the vent openings are exposed. If you have a tank with hinge-and-bolt cover, loosen nuts enough to let out the pressure.

**Performance Steps**

- q. Open manhole and dome covers by standing on the windward side of the transporter. Clean all dirt cinders from around the opening.
- r. Inspect tank to make sure all outlets are in good working condition.
- s. Check position of valve rod handle.
- t. Check to ensure there is a wooden cone shaped stopper on hand to plug the bottom outlet of tank cars in an emergency.

**CAUTION**

Wear appropriate PPE (such as goggles/face shield, chemical protective gloves, and hearing protection as identified in the applicable reference (MSDS)).

## 7. Load rail tank car through bottom outlet.

- a. Perform before-, during-, and after-operations PMCS on the pumps used in the operation.

NOTE: Place pumping unit at least 50 feet from the tank car.

- b. Place a drainage tub under the bottom outlet.
- c. Ensure bottom outlet valve is properly seated.
- d. Remove bottom outlet cap. Let any product trapped in outlet chamber flow into drainage tub.
- e. Open outlet valve and let any residual product in tank drain into drainage tub.
- f. Attach tank car elbow or gossler coupling to tank car.
- g. Connect discharge hose to either elbow or gossler coupling.
- h. Stand on the windward side of the dome, signal when car is full.
- i. Open valve rod from top of tank to allow fuel to enter tank from bottom.
- j. Recheck all hoses and fittings for potential areas of leakage.
- k. Open bottom outlet valve on rail tank car and valves on supply source.
- l. Open suction valve on 350-gallons per million (GPM) pump.
- m. Open discharge valve on pump and increase speed to operating speed. Observe rail tank car as it is filling to avoid spilling and overfilling. When car is 3/4 full, reduce speed of pump to continue filling car. If car has no full mark, fill it to top of tank shell.

NOTE: Never put your head inside the dome of rail tank car.

- n. Observe pump and hose system for leaks and spills as rail tank car is filling. Stop operations immediately if a spill or leak occurs.
- o. Take steps to stop leak and correct problem causing leak immediately.
- p. Clean up spills immediately.
- q. Report all spills to your supervisor.

## 8. Load rail tank car through dome.

NOTE: Top load only in emergencies. The company commander must authorize top loading.

- a. Follow all site preparation procedures listed in performance measure 4 above.
- b. Put end of pump discharge hose through dome until it almost touches bottom of tank.
- c. Ensure there is no more strain than necessary on hose.
- d. Stand on windward side of the dome to observe filling process. Follow procedures in performance measure 5h and 5p above as applicable to top loading.
- e. Handle loading hose carefully when withdrawing it from tank to avoid spills.

## 9. Perform after-operations procedures when rail tank car is loaded.

- a. Let product stand for 15 minutes then perform sampling and gauging procedures.
  - (1) Take an API gravity (see task 101-92F-1409) and temperature of product.
  - (2) Visually inspect product for color and appearance (see task 101-92F-1403).
  - (3) Correct volume for 60 degrees F temperature (see task 101-92F-1409).
  - (4) Record volume on accountability and shipping documents according to DA Pamphlet 710-2-2. Provide data to your supervisor.
- b. Replace bottom outlet cap.

### Performance Steps

- c. Remove drainage tub.
- d. Close and lock dome cover.
- e. Disconnect bonding and grounding equipment.
- f. Place an identification seal on dome cover.
- g. Record seal number on all shipping papers.
- h. Remove FLAMMABLE RESIDUE placards from tank car and replace them with FLAMMABLE placards according to 49 CFR 172.500.
- i. Remove derails.
- j. Release brakes.
- k. Move rail tank car from issue point.

Unloading rail tank car:

10. Perform preliminary procedures for unloading rail tank car.
  - a. Perform PMCS on equipment (such as pumps, filter separators, hose, manifolds, valves, and fittings) to see that they are clean and in good working order.

NOTE: Place pumping unit at least 50 feet from the tank car.

- b. Check storage tanks for cleanliness and ensure there is enough ullage to receive the product.
- c. Position tank car.
- d. Lock brakes and block wheels.
- e. Place STOP TANK CAR CONNECTED signs at least 25 feet from each end of the unloading rail tank car.
- f. Set and lock derails to prevent other tank cars from rolling into unloading tank car.
- g. Check seals and numbers against those on shipping papers to ensure you have received the right shipment. Look at seals and look carefully for signs of tampering and pilferage. Report any tampering or pilferage immediately.
- h. Open safety and vent valves to release internal pressure in rail tank car.

### CAUTION

If safety valve is not working, high pressure may develop in tank car in hot weather. If time permits, relieve pressure by letting car cool overnight. Relieving pressure by venting allows product to vaporize. It also causes a fire hazard.

- i. Open manhole and dome covers from windward side.
  - j. Gauge the tank, take an API gravity test, and record the temperature of the product (see task 101-92F-1409).
    - (1) Correct the volume to 60 degrees F (see task 101-92F-1409).
    - (2) Conduct a visual inspection of the product (see task 101-92F-1403).
    - (3) Record volume on accountability and shipping documents according to DA Pamphlet 710-2-2. Provide data to your supervisor.
  - k. Bond and ground rails, rack stand, and rail tank car, and all other major components in the transfer and storage area.
    - l. Place two fire extinguishers near rail tank car within sight and easy reach.
  - m. Check spill control and cleanup materials for serviceability. Place them within easy reach of system.
11. Unload rail tank car from bottom outlet.
    - a. Ensure bottom outlet valve is seated by turning valve rod or hand wheel in a clockwise direction.
    - b. Place a drainage tub under bottom valve.
    - c. Loosen bottom outlet cap one or two turns to allow trapped product to drain into drainage tub.
    - d. Remove bottom outlet cap and connect pump suction hose to bottom outlet of rail tank car.
    - e. Attach tank car elbow or gossler coupling to tank car.

**Performance Steps**

- f. Connect discharge hose from pump to either elbow or gossler coupling.
- g. Stand on top of rail tank car and watch level of fuel during discharge process.
- h. Recheck all hoses and fittings for potential leakage areas. Correct any problems found.
- i. Open bottom outlet valve of rail tank car and suction valve on pump assembly.
- j. Perform before-, during-, and after-operations PMCS on pump.

NOTE: Place pumping unit at least 50 feet from the tank car.

- k. Start pump and let it idle.
- l. Open discharge valve on pumping assembly and increase pump operating speed.
- m. Observe pump and hose system for leaks and spills as rail tank car is unloaded. Stop operations immediately if a spill or leak occurs.
- n. When rail tank car is empty, let pump drain suction line, then idle pump for three to five minutes before shutting it off.
- o. Close valve on receiving tank prior to shutting down pump.
- p. Close valves on pump and rail tank car.

12. Unload rail tank car through dome.

NOTE: Unloading from dome only when absolutely necessary. Unloading from dome must be authorized by company commander.

- a. Perform preliminary tasks in performance measure 8.
- b. Place suction hose through dome so that it touches bottom of tank.
- c. Put pump in operation as described in performance measure 9.
- d. Ensure hose remains below surface of product while unloading. When car is almost empty, move hose around to draw all product from car.
- e. During pumping operation, observe hoses and connections for leaks. If you see a leak, immediately stop operations and correct it.
- f. Clean up any spills immediately.
- g. Report spills to your supervisor.

13. Perform after-operations procedures on rail tank car.

- a. Disconnect hoses.
- b. Replace bottom outlet cover.
- c. Close and lock dome.
- d. Change FLAMMABLE placards to FLAMMABLE RESIDUE placards according to 49 CFR 172.500.
- e. Remove STOP TANK CAR CONNECTED signs.
- f. Disconnect bonding and grounding equipment.
- g. Remove details.
- h. Release brakes and remove rail tank car from transfer area.

**Evaluation Preparation:** See task Conditions and Standards and have MSDS and all safety equipment.

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—

Loading rail tank car:

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
5. Performed before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to appropriate technical manuals (TMs). Annotated on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)) any faults found while performing PMCS.	—	—
6. Performed preliminary procedures for loading rail tank car	—	—
7. Loaded rail tank car through bottom outlet.	—	—
8. Loaded rail tank car through dome.	—	—
9. Performed after-operations procedures when rail tank car is loaded.	—	—
10. Performed preliminary procedures for unloading rail tank car.	—	—
11. Unloaded rail tank car from bottom outlet.	—	—
12. Unloaded rail tank car through dome.	—	—
13. Performed after-operations procedures when rail tank car.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**  
FM 10-67-1

**Related**  
DA PAM 710-2-2  
FM 3-100.12  
FM 3-100.4  
TM 10-4320-343-14  
TM 5-4930-237-10  
TM 9-2320-279-10-1



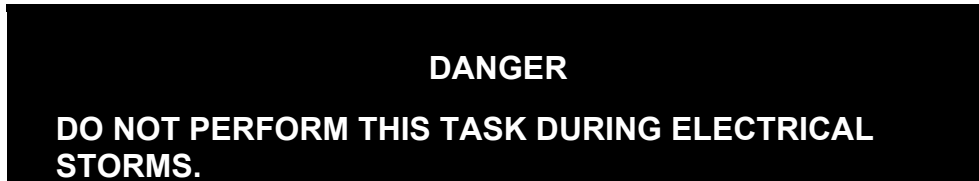
## Perform Petroleum Waterborne Operations

101-92F-1311

**Conditions:** Given the requirement to perform water front fueling operations in a field environment. Personnel and materials required to perform task: three military occupational specialty (MOS)-qualified (92F) Soldiers to assist; fuel source; fire-fighting equipment; waterborne barges or tankers; drip pans; absorbent materials; spill kit/containers; floating booms; chemical dispersants; skimming boats; risk management procedures; applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE); Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; DA Form 3853-1 (Innage Gage Sheet (Using Innage Tape and Bob)); DA Form 3853-2 (Outage Gage Sheet (Using Innage Tape and Bob)); DA Form 3853-3 (Outage Gage Sheet (Using Outage Tape and Bob)); and full access to all reference materials.

**Standards:** Load and unload waterborne barges and tankers without injury to personnel, damage to equipment, or pollution of the environment.

### Performance Steps



Failure to perform this task correctly may result in damage to equipment or injury or death to personnel.

NOTE: In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements of the task before performing it to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor.

Inspecting/preparing facilities for loading/unloading procedures.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.

## Performance Steps

4. Wear appropriate PPE as required.

### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Check to see that vessel is properly moored.
  - a. Ensure mooring lines are taut enough to hold vessel steady, but loose enough to allow vessel to rise and fall with tides and varying loads. Watch and adjust lines during loading and unloading procedures.
  - b. Ensure mooring lines have a manila rope or synthetic fiber rope which can be cut as an emergency release.
6. Ground vessel to dock.
  - a. Inspect grounding system for continuity.
  - b. Make sure grounding switch is open.
  - c. Make sure grounding cable is attached to a bare metal spot on hull of vessel.
  - d. Make sure all grounding connections are tight.
  - e. Close grounding switch.
7. Prepare for operational spills.
  - a. Review local spill contingency plan and local SOPs for requirements dealing with catastrophic spills, as well as routine operational cleanup.
  - b. Acquire appropriate equipment for containing and cleaning up spills. This includes such items as drip-pan containers, absorbent floating booms, chemical dispersants, skimming boats, and other specialized equipment subject to local availability.
  - c. Assign responsibility to appropriate number of personnel for handling spills. Drill spill cleanup crew on spill prevention and cleanup procedures.

### CAUTION

Wear appropriate personal protective equipment (such as goggles, hearing protection, and chemical protective gloves).

8. Inspect, gauge, and sample vessel tanks.
  - a. Prior to loading, inspect vessel.
    - (1) Plan the order in which products should be delivered.
    - (2) Inspect hull of vessel for damage and leaks. Inform your supervisor if damage or leaks are found.
    - (3) Examine pipelines, pumps, and deck manifold for leaks or damage. Inform your supervisor if leaks or damage is found.
    - (4) Open all valves in cargo lines, except sea suction valves. From outside tank, watch for line drainage into cargo tanks. Make sure that cargo lines are completely drained.
    - (5) Inspect interiors of cargo tanks using an explosion-proof flashlight. Look for holdover product, residue, water, mud, scale, rust, and other contaminants. Inform your supervisor if any contamination is found.
    - (6) Check ship log to determine last cargo carried.
    - (7) Make sure all fire, safety, and environmental protection precautions have been taken.

**Performance Steps**

- b. Prior to loading and unloading, determine ullages, temperatures, API gravities, water soundings, and innage or outage tank gauges in the vessel compartments and record them on DA Form 3853-1, DA Form 3853-2, or DA Form 3853-3. The form used will depend on the gauging method used. Gauge tanks using the following procedures:
- (1) Repeat gauging until two readings are the same.
  - (2) Ground static electricity by placing a bare hand on tank shell or handrail before gauging tank.
  - (3) Open gauging hatch from windward side.
  - (4) Stand on gauging platform if one is available.
  - (5) Keep tape against rim of gauging hatch at all times to avoid a buildup of static electricity. Take all gauge readings to nearest 1/8 inch. Wipe tape clean and dry after each use.
  - (6) Take product temperature immediately before or after gauging so that volume can be corrected to 60 degrees F.
  - (7) Allow as much time as possible for water, solids, and bubbles to settle before gauging after adding fresh stock to a storage tank. In ship-to-shore discharge, tanks may be gauged after product has settled for 30 minutes.
  - (8) Gauge all incoming bulk deliveries for water bottoms before product is received. Drain off any water found in tank cars or tank vehicles before discharging product.
  - (9) Never measure product in any tank during an electrical storm.
  - (10) Use innage tape and bob for innage gauge:
    - (a) Review last innage gauge sheet posted to determine expected product level prior to gauging a tank.
    - (b) Place product-indicating paste on tape where product cut is expected. Place unmarked side of tape against metal rim of gauging hatch at reference point.
    - (c) Lower tape and bob into tank until bob is a short distance from bottom.
    - (d) Unwind tape slowly until tip of bob touches tank bottom or datum plate. Make sure bob does not rest on a river or other obstruction. Make sure bob is not resting on bottom of tank.
    - (e) Withdraw tape quickly and observe the product cut. Record cut as innage gauge. If cut is hard to read, put product-indicating paste on tape.
    - (f) Get two identical readings to make sure measurement is correct.
  - (11) Use an innage tape and bob for an outage gauge.
    - (a) Place unmarked side of tape against metal rim of gauging hatch at reference point.
    - (b) Lower tape and bob into tank until bob touches surface of product.
    - (c) Wait until bob stops moving. Lower tape slowly until bottom of bob is two or three inches below surface of product. Record reading on tape at reference point as tape reading.
    - (d) Withdraw tape quickly and record product cut on bob as bob reading.
    - (e) To get outage gauge, subtract bob reading from tape reading.
    - (f) To convert outage gauge to innage gauge, subtract outage gauge from reference height of tank.
  - (12) Use outage tape and bob.
    - (a) Hold unmarked side of tape against metal rim of gauging hatch at reference point.
    - (b) Lower tape and bob into tank until bob touches surface of product.
    - (c) Wait until bob stops moving. Lower tape slowly until bottom of bob is two or three inches below surface of product. Record reading on tape at reference point.
    - (d) Withdraw tape quickly and record product cut on bob as bob reading. If product cut is hard to read, put product-indicating paste on bob and gauge tank again.
    - (e) Add bob reading to tape reading to get outage gauge.
    - (f) Subtract outage gauge from reference height of tank to convert outage gauge to innage gauge.
  - (13) Determine bottom sediment and water (BSW).
    - (a) Put a thin, even coat of water-indicating paste on part of bob that will be at point where water and product meet. If depth of water is greater than length of bob, use a water gauge bar.

**Performance Steps**

- (b) Hold side of tape against metal rim of gauging hatch at reference point.
  - (c) Lower tape and bob into tank until bob is a short distance from bottom. Determine this by comparing length of unwound tape with reference height of tank.
  - (d) Unwind tape slowly until tip of bob touches tank bottom or datum plate. Make sure bob is not caught on an obstruction. Do not unwind tape so far that bob will tilt and cause an incorrect reading.
  - (e) Keep tape and bob in gauging position 5 to 10 seconds for kerosene, gasoline, and other light products. Keep it in position for 15 to 30 seconds for heavier products.
- c. Before loading operations begin, remove ballast from vessel tanks.
- (1) Determine amount of ballast to be pumped ashore and make sure shore tanks have enough ullage to hold it.
  - (2) Connect one end of ballast hose to ballast pipeline connection on dock.
  - (3) Connect other end of ballast hose to stripping connection on deck.
  - (4) Open valves aboard vessel to empty desired tanks.
  - (5) Open correct shore valves to permit pumping to ballast tank.
  - (6) Start stripping pump.
  - (7) Watch pressure gauge to make sure proper valves are open. If pressure is higher than normal, line may be blocked.
  - (8) Do not transfer ballast water and product at the same time unless there is an emergency.
  - (9) Continue pumping until all possible ballast water is removed from vessel.
  - (10) After all ballast is removed, stop pump and close shore valves so that ballast will not drain back into vessel lines.
  - (11) Open valves in cargo lines, except sea suctions, to observe any line drainage into cargo tanks. They must make sure that cargo lines are drained completely.
  - (12) Make sure that each tank is free of ballast and suitable to receive product.

9. Gauge (see performance measure 4 above) and sample shore tanks (see task 101-92F-1403) prior to loading and unloading.

NOTE: This is necessary to correct the measured quantity to quantity at the standard temperature of 60 degrees Fahrenheit (F). Volume-correct quantities according to AR 710-2.

10. Prepare DA Form 3853-1, DA Form 3853-2, or DA Form 3853-3 depending on gauging method used.
- a. Fill out information on DA Form 3853-1 using Table 3-6.
  - b. Fill out information on DA Form 3853-2 using Table 3-7.
  - c. Fill out information on DA Form 3853-3 using the same information in Table 3-7.

**Performance Steps****Table 3-6. DA Form 3853-1 Entries**

FORM BLOCK TITLE	INFORMATION ENTERED
Unit	Enter company operating tank farm.
Date	Enter gaging date.
Time	Enter gaging time.
Location	Enter location of storage tank.
API Gravity	Enter API gravity of product.
Opening/Closing/Inventory	Check block for type of gauge.
Tank No.	Enter tank identification number.
Nominal Tank Capacity	Enter storage tank size.
Product and Grade	Enter type of product in tank (for example, DF-2, JP-8).
Tape Reading/Linear Reading (Line 1)	Enter product reading from tape in feet and inches.
Tape Reading/Volumetric Equivalent (Line 1)	Enter gallons of product from strapping chart based on tape reading.
Bob Reading/Linear Reading (Line 2)	Enter height of water on bob in feet and inches.
Bob Reading/Volumetric Equivalent (Line 2)	Enter gallons of water and sediment from strapping chart using linear reading.
Net Volume of Product, Uncorrected for Temperature (Line 3)	Subtract volumetric equivalent in Line 2 from Line 1.
Average Temperature (Line 4)	Record temperature of product in degrees Fahrenheit in the linear column.
Multiplier (Line 5)	Enter temperature conversion multiplier in linear reading column.
Net Quantity of Product (Line 6)	Multiply Line 3 by Line 5 and enter volume in volumetric at 60 Degrees equivalent.
Remarks	Enter sample number of any samples taken and any other remarks required by local policies.
Name and Grade of Operations Officer	Type or print name and grade of operations officer.
Name and Grade of Gager	Type or print name and grade of gager.
Signature of Operations Officer	Self-explanatory.
Signature of Gager	Self-explanatory.

**Table 3-7. DA Form 3853-2 and DA Form 3853-3 Entries**

FORM BLOCK TITLE	INFORMATION ENTERED
Unit	Enter company operating tank farm.
Date	Enter gaging date.
Time	Enter gaging time.
Location	Enter tank farm location.
API Gravity	Enter API gravity of product.
Opening/Closing/Inventory	Check type of gaging.
Tank No.	Enter tank identification number.
Nominal Tank Capacity	Enter capacity of tank in barrels.
Product and Grade	Enter type of product (for example, DF-2 or JP-8).
Tape Reading (Line 1)	Enter product reading from tape in feet and inches in linear reading column.
Bob Reading (cut) (Line 2)	Enter product reading from bob in inches in linear reading column.
Reference height (Line 3)	Enter reference height of tank in feet and inches.
Outage (Line 4)	Enter length of outage (Line 1 minus Line 2) in feet and inches in the linear reading column.
Innage (Line 5)	Enter length of innage (Line 3 minus Line 4) in feet and inches in the linear reading column. Convert the linear reading to a volume in gallons and enter that number in the volume column.
Bottom Sediment and Water (Line 6)	Enter water reading from bob in inches in the linear reading column. Convert this reading to a volume in gallons using the tank strapping chart and enter that number in the volume column.
Net Volume of Product, Uncorrected for Temperature (Line 7)	Subtract volumetric readings in Line 6 from Line 5 and enter that number in the volume column.
Average Temperature (Line 8)	Enter average temperature of product in degrees Fahrenheit in the linear reading column.
Multiplier (Line 9)	Enter temperature conversion multiplier.
Net quantity of product at 60° F (Line 10)	Multiply Line 7 by Line 9 and enter the quantity in the volume column.
Remarks	Enter sample number of any samples taken and any other comments required by local policy.
Name and Grade of Operations Officer	Printed/typed name and grade of operations officer.

**Performance Steps**

11. Check valves and hoses for leaks and operational readiness.
  - a. Operate valves to check serviceability.
  - b. Inspect hoses for cracks, excessive wear, and fraying. Replace unserviceable hoses.
  - c. Inspect hoses for contamination. Clean or replace contaminated hoses, depending on nature of contamination and product to be pumped.
  - d. Make sure there is enough hose to allow for slack for tide changes, weather, and hose layout.

**Performance Steps**

12. Place caution signs at conspicuous locations on dock.
    - a. Post NO SMOKING, NO LOITERING, and DANGER: THIS VESSEL HANDLING PETROLEUM signs and traffic direction markers on the dock.
    - b. Post NO FIRES, NO SMOKING, and NO VISITORS signs on vessel gangway while product is being transferred.
    - c. Ensure vessel displays red flag (day) or red light (night) during transfer operations.
  13. Connect cargo hoses.
    - a. Make sure vessel is grounded to dock manifold before any hoses are connected.
    - b. Recheck hose for serviceability.
    - c. Place drip pans on shipboard and dock connections.
    - d. Attach hose to hose support.
    - e. Attach hose to ship hoist and raise it into position to connect it to ship manifold.
    - f. Connect hose using at least four alloy-steel bolts or at least two bolts and C-clamps, if C-clamps are used.
    - g. Keep hose suspended above deck during transfer operations.
  14. Preheat cargo prior to pumping, if required.
  15. Open appropriate shore and vessel valves.
    - a. Pump at low speed until operator can determine that pumping operations are going as planned. Observe pressure gauges for sudden increases (closed valve or blocked hose) or decreases in pressure (ruptured line, leaking tank). Observe vessel to ensure it maintains proper trim and sufficient draft. Adjust mooring lines and hoses for movement of the vessel.
    - b. Once operator has determined operations are normal (and product is three feet above inlet during loading) begin pumping product at maximum allowable rate.
    - c. As tanks reach 90 percent full, slow pump rate to top off tanks.
    - d. If an electrical storm is within three miles, immediately stop all transfer operations and close all valves. If there is an immediate hazard, disconnect and drain the transfer hose.
  16. Perform before-operations PMCS and start pumps (see task 101-92F-1415).
  17. Observe all hose connections, line connections, and valves for leaks. Stop operations and repair leaks immediately as they occur.
- Stopping loading/unloading operations
18. Close all line valves and shut down pumps (see task 101-92F-1415).
  19. Gauge and sample shore tanks (see task 101-92F-1403). Convert all volumes to volume at 60 degrees F.
  20. Gauge and sample vessel tanks (see task 101-92F-1403) as necessary. Convert all volumes to volume at 60 degrees F.

**Evaluation Preparation:** See task Conditions and Standards.

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
4. Wore appropriate PPE as required.	—	—
5. Inspected and prepared facilities for loading and unloading operations.	—	—
6. Grounded vessel to dock.	—	—
7. Prepared for operational spills.	—	—
8. Inspected, gauged, and sampled vessel tanks.	—	—
9. Gauged and sampled shore tanks prior to loading and unloading.	—	—
10. Prepared DA Form 3853-1, DA Form 3853-2, or DA Form 3853-3 depending on gauging method used.	—	—
11. Checked valves and hoses for leaks and operational readiness.	—	—
12. Placed caution signs at conspicuous locations on dock.	—	—
13. Connected cargo hoses.	—	—
14. Preheated cargo prior to pumping, if required.	—	—
15. Opened appropriate shore and vessel valves.	—	—
16. Performed before-operations PMCS and started pumps.	—	—
17. Observed all hose connections, line connections, and valves for leaks. Stopped operations and repaired leaks immediately as they occur.	—	—
18. Closed all line valves and shut down pumps.	—	—
19. Gauged and sampled shore tanks. Converted all volumes to volume at 60 degrees F.	—	—
20. Gauged and sampled vessel tanks as necessary. Converted all volumes to volume at 60 degrees F.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 3853-1
- DA FORM 3853-2
- DA FORM 3853-3
- DOD 4140.25-M
- FM 10-67-1

**Related**

- AR 200-1
- AR 710-2
- FM 3-100.12
- FM 3-100.4



**Perform Refuel on the Move (ROM) Operations****101-92F-1410**

**Conditions:** Given the requirement to perform fueling operations in a field environment. Personnel and materials required to perform task: nine military occupational specialty (MOS)-qualified (92F) Soldiers; ROM kit; 5,000-gallon tank semitrailer; fuel source; 550-foot long by 150-foot wide area; a spill contingency kit; risk management procedures; applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE); Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; unit hazardous waste/hazardous material (HW/HM) management policy; unit tactical standing operating procedure (TSOP); oral or written operations order (OPORD); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); DA Form 3643 (Daily Issue of Petroleum Products), and full access to all reference materials. The area is secure, no enemy contact is expected, and vehicles to be refueled are on hand.

**Standards:** Layout, assemble, perform operator's PMCS, operate, maintain fuel accountability record, and disassemble the ROM without damage to equipment or injury to personnel.

**Performance Steps****DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

**WARNING**

**Due to safety considerations, normal vehicle refueling is done with the engine off. AR 385-55 states that commanders will apply all normal safety standards to their operations unless it is necessary to change due to the mission. In training situations, changes may be authorized only by the commander. Commanders will evaluate the significance of the assumed risk versus the training benefit. In combat operations, commanders will make decisions based on mission, enemy, terrain, troops, time available, civilian considerations (METT-TC) and risk analysis.**

## Performance Steps

NOTE: In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements of the task before performing it to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor. Wear the appropriate PPE such as goggles, chemical protective gloves, and hearing protection as identified in the applicable reference (MSDS).

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation standing operating procedure (SOP)/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Wear appropriate PPE as required.

### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Perform before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to appropriate technical manuals (TMs). Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.
6. Assemble ROM kit.
  - a. Spot 5,000-gallon tanker in designated area.
  - b. Ground tanker and place spill containers and fire extinguishers in position.
  - c. Make all necessary connections.
    - (1) Connect three 4-inch by 14-foot sections of discharge hose to the 4-inch discharge fitting on the tanker.
    - (2) Connect 4 x 4 x 4-inch T assembly to end of discharge hose.
    - (3) Connect 4 x 3-inch (female to male) reducer to T assembly.
    - (4) Connect 3 x 4-inch double male adapter to T assembly.
  - d. Perform before-operations PMCS on tanker pump and gauge tanker.
  - e. Consecutively lay out and assemble eight refuel points.
    - (1) Connect a 3 x 3 x 1 1/2-inch T assembly to a Quick acting valve assembly.
    - (2) Connect two 25-foot x 1 1/2-inch hoses to Quick acting valve assembly.
    - (3) Connect a 1 1/2-inch nozzle assembly to end of two 25-foot x 1 1/2-inch hoses.
    - (4) Position a spill container under nozzle and a fire extinguisher near it.
    - (5) Connect one 3-inch x 50-foot section of discharge hose to 3-inch T assembly.
    - (6) Connect one 3-inch x 25-foot section of discharge hose to 50-foot section.
  - f. Ground and hang all nozzles.
  - g. Check system for leaks, loose connections, and safety hazards.
7. Operate ROM kit.

**Performance Steps**

- a. Place spill container under nozzle port of vehicle.
  - b. Connect bonding wire to vehicle being fueled before inserting nozzle.
  - c. Signal noncommissioned officer in charge (NCOIC) that refueling can begin.
  - d. On signals from NCOIC, start and stop pump for a predetermined time. Stop system immediately if leaks occur.
  - e. When fueling is complete, remove nozzle from vehicle being refueled prior to removing bonding cable.
  - f. Remove spill container from under nozzle port of vehicle.
  - g. Ground guide vehicles out of refueling area.
  - h. Record issue on DA Form 3643 (Daily Issues of Petroleum Products) according to DA Pamphlet 710-2-1.
  - i. Clean up any spilled fuel immediately in accordance with local procedures for environmental protection.
8. Disassemble ROM.
- a. Close discharge valve on 5,000-gallon tanker.
  - b. Evacuate hose line.
    - (1) Disconnect hose from discharge side of tanker. Ensure drip pans are in place to prevent fuel spillage.
    - (2) Connect hose to suction side of tanker.
    - (3) Start pump and open suction valve to create suction through hose.
    - (4) Hold nozzles open at refuel points.
    - (5) Once hoses are evacuated, close all Quick acting valves.
  - c. Load and stack equipment.
    - (1) Disassemble hoses in reverse order of assembly.
    - (2) Store hoses and other equipment in trailers according to load plan.
  - d. Check site for spilled fuel. Collect all fuel contaminated soil, other fuel contaminated materials, and waste fuel and dispose of them in an environmentally safe manner in accordance with local policies. Report any spills in accordance with procedures established in the ISCP and unit SOP.
9. Complete DA Form 2404 or DA Form 5988-E and DA Form 3643 and turn in to supervisor.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—
5. Performed before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to appropriate technical manuals (TMs). Annotated on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.	—	—
6. Assembled ROM kit.	—	—
7. Operated ROM kit.	—	—

**Performance Measures**

8. Disassembled ROM.

GO

NO-GO

—

—

9. Completed DA Form 2404 or DA Form 5988-E and DA Form 3643 and turned in to supervisor.

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**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

FM 10-67-1

TM 5-4930-237-10

TM 9-2320-279-10-1

TM 9-2330-356-14

**Related**

AR 200-1

DA PAM 710-2-1

FM 3-100.12

FM 3-100.4

## Perform Petroleum Tank Vehicles Operations

### 101-92F-1414

**Conditions:** Given the requirement to load and dispense petroleum products from tank vehicles in a field environment. The Soldier (assigned to a petroleum element) must perform operator's preventive maintenance checks and services (PMCS), load, and dispense products from petroleum tank vehicles. Materials required to perform task: risk management procedures; applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE) such as face shield/goggles and chemical protective gloves; 1,200-, 2,500-, and 5,000-gallon tank vehicles full or empty; Tank and Pump Unit (TPU); Refuel on the Move (ROM) kit/equipment; Heavy Extended Mobility Tactical Truck (HEMTT) Tanker Aviation Refueling System (HTARS) equipment; Movement Tracking System (MTS), an operational Fuel System Supply Point (FSSP) or other fuel source; spill containers; fire extinguishers; American Petroleum Institute (API) gravity equipment; a cup-case thermometer; appropriate gauging equipment (stick or other); gauge worksheets; rags; DA Form 3643 (Daily Issues of Petroleum Products); DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; unit standing operating procedure (SOP); oral or written operations order (OPORD); and full access to all reference materials.

**Standards:** Perform operator's PMCS and dispatch equipment. Position vehicle at site, load, dispense products from petroleum tank vehicles, and maintain fuel accountability record without injury to personnel or damage to equipment and surrounding area.

#### Performance Steps

### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

NOTE: In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements before performing the task to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.

## Performance Steps

4. Wear appropriate PPE as required.

### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Perform before-, during-, and after-operations PMCS on system's components according to appropriate TMs. Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.
6. Safety considerations for tank vehicles:
  - a. Position tank vehicle facing nearest exit.
  - b. Do not block exit routes.
  - c. Conduct petroleum operations on level ground.
  - d. Choke wheels and set parking brake on tank vehicle.
  - e. Keep at least 25 feet between tank vehicles during all fuel servicing operations.
  - f. Open manhole cover during all loading, unloading, and fuel servicing operations.
  - g. Post NO SMOKING signs within 50 feet of fueling operations.
  - h. Position fire extinguisher within five to ten feet of fuel servicing operations.
  - i. Bond and ground all equipment.
  - j. Protect yourself and others against fumes and vapors.
  - k. Use spill containers.
7. Dispatch vehicle using DD Form 1970 or DA Form 5987-E and DA Form 2404 or DA Form 5988-E.
  - a. Present your OF Form 346 (U.S. Government Motor Vehicle Operator's Identification Card) or DA Form 5984-E (Operator's Permit Record (EGA)) to motor pool dispatcher to dispatch equipment.
  - b. Obtain equipment record folder from dispatcher once he/she has verified you are qualified to operate equipment.
  - c. Perform before-operations PMCS on equipment using appropriate technical manual (TM). Annotate on DA Form 2404 or DA Form 5988-E appropriately.
8. Gauge petroleum tank vehicles.
  - a. Position tank vehicle.
  - b. Position fire extinguishers within five to ten feet of operation.
  - c. Review shipping document to verify type of fuel in tank vehicle.
  - d. Bond and ground vehicle.
  - e. Ground self from static electricity.
  - f. Open manhole cover with wind at your back to avoid breathing fuel vapors.
  - g. Insert thermometer as soon as each hatch is opened to measure temperature.
  - h. Gauge compartment using tank vehicle gauge stick provided with tank vehicle, applying fuel and water indicating paste to stick as required for accurate gauge reading.
  - i. Repeat gauging procedures until two identical readings are obtained to ensure gauge is accurate and record on the gauge sheet.
  - j. Take an all level sample according to task 101-92F-1403.
  - k. Measure API gravity of sample according to task 101-92F-1409 and record on gauge work sheet. Quantities of less than 3,500 gallons do not require volume corrections or measurement of API gravity.
  - l. Remove thermometer after required time and record temperature on gauge work sheet.
  - m. Correct volume to 60 degrees F (according to task 101-92F-1409) if required. Record and give gauge work sheet to your supervisor.

**Performance Steps**

9. Operate TPU according to TM 10-4930-236-13&P.

**CAUTION**

Gloves, hearing protection, and goggles need to be worn when performing any fueling operations.

- a. Dispense fuel with TPU using engine driven pump.
- (1) Lower tailgate and install grounding rod according to FM 10-67-1. Connect grounding cable from grounding rod to TPU unit.
  - (2) Place fire extinguisher within five to ten feet of operation.
  - (3) Perform before-operations PMCS on the TPU according to TM 10-4930-236-13&P.
  - (4) Open manhole cover on tanks.

**WARNING**

**Open manhole slowly to relieve pressure. If there is pressure build up, personnel may be injured.**

- (5) Attach a second ground wire to receptacle or vehicle to be fueled.
  - (6) Pull out dispensing hose to desired length and attach nozzle bonding clip to fuel receptacle.
  - (7) Place spill container under nozzle port of vehicle.
  - (8) Open fuel receptacle and insert nozzle. Maintain metal-to-metal contact.
  - (9) Start pump.
    - (a) Open fuel shutoff valve.
    - (b) Turn ignition switch on.
    - (c) Close choke.
    - (d) Wind rope clockwise around pulley and pull it sharply.
    - (e) Set throttle and allow engine to run at moderate speed for three to five minutes.
  - (10) Perform during-operations PMCS according to TM 10-4930-236-13&P.
  - (11) When refuel operation is complete, close discharge valves on tanks.
  - (12) Stop engine.
    - (a) Allow an internal combustion powered pump to idle for three to five minutes.
    - (b) Shut off ignition switch after engine has cooled.
  - (13) Record issue on DA Form 3643 (Daily Issue of Petroleum Products) according to DA Pamphlet 710-2-1.
  - (14) Perform after-operations PMCS according to TM 10-4930-236-13&P. Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by operator. Inform your supervisor if system is found to be non-mission capable (NMC).
- b. Dispense fuel with TPU using electrical pump.
- (1) Lower tailgate and install grounding rod according to FM 10-67-1. Connect grounding cable from grounding rod to TPU unit.
  - (2) Place fire extinguisher within five to ten feet of operation.
  - (3) Perform before-operations PMCS on TPU according to TM 10-4930-236-13&P.
  - (4) Open manhole cover on tanks.

**Performance Steps**

**WARNING**

**Open manhole slowly to relieve pressure. If there is pressure build up, personnel may be injured.**

- (5) Connect ON-OFF switch/cable assembly to junction box.
- (6) Connect intervehicular power cable and adapter, if required, to junction box receptacle and vehicle North Atlantic Treaty Organization (NATO) slave receptacle.
- (7) Attach a second ground wire to receptacle or vehicle to be fueled.
- (8) Pull out dispensing hose to desired length and attach nozzle bonding clip to fuel receptacle.
- (9) Place spill container under nozzle port of vehicle.
- (10) Pull either or both tank valve control levers to the ON position.

**WARNING**

**An overheated pump creates a potential fire hazard and will cause pump damage. Do not allow pump to run longer than one minute with nozzles closed. Do not run pump with tank valves closed.**

- (11) Open fuel receptacle and insert nozzle into tank being fueled and squeeze nozzle lever. Maintain metal-to-metal contact.
  - (12) Move ON-OFF switch to ON position.
  - (13) When tank is full, release nozzle lever.
  - (14) Move ON-OFF switch to OFF position and store cable on truck.
  - (15) Remove dispensing nozzle from tank, disconnect nozzle ground clamp or plug, and rewind hose onto hose reel.
  - (16) Move tank valve control levers to OFF position.
  - (17) Record issue on DA Form 3643 (Daily Issues of Petroleum Products) according to DA Pamphlet 710-2-1.
  - (18) Perform after-operations PMCS according to TM 10-4930-236-13&P. Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by operator. Inform your supervisor if system is found to be NMC.
- c. Filling tanks through bottom loading port.
- (1) Perform grounding procedures according to steps (a)(1) and (2) above.
  - (2) Place spill containers under vehicles.
  - (3) Open manhole latch and fill cap on both tanks.
  - (4) Position both tank valve levers in OFF position.
  - (5) Remove cover from bottom loading port and attach filling pump nozzle to bottom loading port.

**CAUTION**

The manhole fill cap must be open during bottom loading operation. Failure to open the manhole will cause a pressure build up within the tanks that could cause the tanks to rupture or explode.



**Performance Steps**

- (a) Center point refueling nozzle operation. Remove dust cover from end of nozzle body. Grasp handles and hold nozzle in alignment with TPU refueling adapter. Press nozzle body against adapter and turn handles to right until end of nozzle mates and locks to TPU refueling adapter. Rotate control lever to full OPEN position. To disconnect, rotate control lever to full CLOSED position. Grasp handles and rotate nozzle body to left until it disconnects from TPU adapter.
  - (b) CCR Nozzle. Mate CCR nozzle to fill port. Pull back on control handle latch and then push flow control handle up toward aircraft into FLOW position. A red indicator will pop out of back of nozzle when tank is full. Pull back on flow control handle to move it into NO FLOW position. Unlatch nozzle.
  - (6) Start pump.
  - (7) Operate filling pump nozzle to load fuel. Monitor 600 gallon fuel tanks being filled.
  - (8) Perform during-operations PMCS according to TM 10-4930-236-13&P.
  - (9) Stop pump when filling operation is complete.
  - (10) Disconnect nozzle and replace cover on bottom loading port and nozzle.
  - (11) Close and latch both manhole fill caps.
  - (12) Gauge tanks note amount of fuel received on DA Form 3643 (Daily Issues of Petroleum Product).
  - (13) Disconnect and stow grounding equipment and spill containers.
  - (14) Perform after-operation PMCS according to TM 10-4930-236-13&P. Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by the operator. Inform your supervisor if system is found to be NMC.
- d. Obtaining a fuel sample.
- (1) Perform steps 1 through 3 in 4b (electric pump operations) above.
  - (2) With ON/OFF switch set to OFF position, disconnect outlet hose from filter separator outlet.
  - (3) Attach sample probe adapter to filter separator outlet then connect outlet hose to sample probe adapter.
  - (4) Dispense fuel following steps in 4b above. While fuel is being dispensed, remove cap from probe and extract fuel sample.
  - (5) Install cap on probe.
  - (6) Move ON/OFF switch to OFF position.
  - (7) Squeeze dispensing nozzle lever to release any built up fuel pressure.

**WARNING**

**Fuel spills create a potential fire hazard. When disconnecting outlet hose, some fuel within outlet hose and sample probe adapter will be released. Use drip pan to catch fuel.**

- (8) Provide suitable container to catch spilled fuel, then disconnect outlet hose to outlet.
  - (9) Remove sample probe adapter from filter separator outlet, then connect outlet hose to outlet.
- e. Perform after-operation PMCS shutdown procedures (electrical pump).
- (1) Check to see both fuel dispensing hoses are fully wound onto hose reels.
  - (2) Check that static ground cable is fully wound onto static reel.
  - (3) Check that both fill caps on manholes are closed securely.
  - (4) Remove dipstick from A-Frame.
  - (5) Remove plug from each tank's access port and use dipstick to measure quantity of fuel remaining in each fuel tank.
  - (6) Install plugs in access ports and return dipstick to its stowed position on A-Frame.
  - (7) Make certain ON/OFF switch cable is in OFF position. Coil and secure to unit or stow in tool box.

**Performance Steps**

- (8) Move both tank valve control levers to OFF position.
- (9) Make certain ground rod is secured in its stowed position on A-Frame.
- (10) Open drain cock on filter separator to release water from filter separator. Once water has drained, close drain cock.
- (11) Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by operator. Inform your supervisor if system is found to be NMC.

10. Operate HEMTT according to TM 9-2320-279-10-1.

a. Bottom load tank with exterior pump.

- (1) Prepare tanker for operation.
  - (a) Perform before-operations PMCS according to TM 9-2320-279-10-1. Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by the operator. Inform your supervisor if the system is found to be NMC.
  - (b) Position tanker controls.
    - 1. Push MC MAMUAL CONTROL EM VALVE lever full forward and down.
    - 2. Push V6 FUEL/DEFUEL VALVE full into fueling position.
    - 3. Close VII FLOW VALVE (REG).
    - 4. Push V8 REEL VALVE (H2) straight up to close.
    - 5. Close V18 BULK DEL VALVE.
    - 6. Close V15 DRAIN VALVE.
    - 7. Turn flow meter reset knob to zero scale.
    - 8. Set TC/THROTTLE CONTROL switch down to OFF position.
    - 9. Set TL1/TANK LEVEL INDICATOR switch down to OFF position.
    - 10 Set APC/AUXILIARY PUMP CONTROL switch APC to shut off.
    - 11. Pull back on PUMP ENGAGEMENT LEVER until locked.
    - 12. Close V17 GRAVITY VALVE.
    - 13. Close V12 B/L PRECHECK VALVE.
    - 14. Close V7 REEL VALVE (H1).
    - 15. Move V3 SUCTION LINE VALVE handle to OPEN position.
  - (c) Place grounding rod in ground according to FM 10-67-1. Connect static line from HEMTT to grounding rod.

NOTE: Both vehicles and equipment involved must be bonded and grounded before performing fueling procedures.

- (d) Position fire extinguisher within five to ten feet of operation.
- (e) Gauge fuel gauge:

- 1. Open right side pump module rear door.
- 2. Set TL1/TANK LEVEL INDICATOR switch to ON.
- 3. Read tank fuel level on indicator gauge.

NOTE: If TL1/TANK LEVEL INDICATOR gauge does not show fuel level reading, check fuel level with dipstick according to TM 9-2320-279-10-1.

- 4. Set TL1/TANK LEVEL INDICATOR switch to OFF.
- 5. Close right side pump module rear door.
- (2) Connect SR1 and SR2 static cables to source of fuel and to grounding devices.
- (3) Remove dust cap from A B/L RECEPTACLE.
- (4) Remove D1 adapter from stowage.
- (5) Place end of D1 adapter on A B/L RECEPTACLE and aline key ways.
- (6) Push in and turn D1 adapter clockwise until locked in place.
- (7) Check that D1 adapter valve lever is in CLOSE position.
- (8) Open stowage tube cover and remove suction hose.
- (9) Remove 3-inch adapter coupling from stowage and connect to one end of suction hose.
- (10) Connect 3-inch adapter coupling to D1 adapter.
- (11) Connect other end of suction hose to fuel supply.

**Performance Steps**

- (12) After fuel flow is started by fuel station operator, move D1 adapter valve lever to OPEN position.

**CAUTION**

Do not continue fuel loading if fuel flow does not stop within about 15 seconds after V12 B/L PRECHECK VALVE is opened or tanker may be damaged.

- (13) As soon as fuel starts flowing, open V12 B/L PRECHECK VALVE. If fuel flow stops within approximately 15 seconds, close V12 B/L PRECHECK VALVE and continue fuel loading. If fuel flow does not stop within approximately 15 seconds, stop fuel loading and notify organizational maintenance.
- (14) When tank is full and fuel flow stops automatically, move D1 adapter valve lever to CLOSE position.
- (15) After fuel station operator shuts off fuel, disconnect 3-inch adapter coupling from D1 adapter.
- (16) Remove D1 adapter.
- (17) Drain fuel from suction hose and dispose of fuel in accordance with unit SOP.
- (18) Disconnect suction hose from fuel supply.
- (19) Remove 3-inch adapter coupling from suction hose.
- (20) Stow suction hose, 3-inch adapter coupling, and D1 adapter.
- (21) Install dust cap on A B/L RECEPTACLE.
- (22) Perform after-operations PMCS according to TM 9-2320-279-10-1. Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by operator. Inform your supervisor if system is found to be NMC.
- (23) Disconnect and rewind SR1 and SR2 static cables.
- (24) Close pump module rear doors.
- b. Bottom load tank with tanker fuel pump.
- (1) Start engine and position vehicle to load fuel according to TM 9-2320-279-10-1.
- (2) Park vehicle according to TM 9-2320-279-10-1.
- (3) If vehicle is equipped with self recovery winch, check that PTO ENGAGE switch is set to OFF.
- (4) If vehicle is equipped with self recovery winch, push in SELECTOR VALVE for tanker pump operation.
- (5) Set PTO engage switch to ON position.
- (6) Open pump module rear doors.
- (7) Position tanker controls.
- (8) Connect static cables to vehicle being serviced and to grounding devices (bond and ground).
- (9) Remove dust caps from A B/L, B GRAVITY and C Bulk RECEPTACLES. Remove 3-inch adapter coupling and D1 adapter from stowage. Place end of D1 adapter on A B/L RECEPTACLE and aline key ways.
- (10) Push in and turn D1 adapter clockwise until locked in place. Check that D1 adapter valve lever is in CLOSE position.
- (11) Connect 3-inch adapter coupling to end of suction hose and then to D1 adapter. Connect other end of suction hose to C BULK RECEPTACLE (UNFIL).
- (12) Connect one end of fuel station suction hose to B GRAVITY RECEPTACLE and the other end of the fuel station hose to fuel supply.
- (13) After fuel flow control valve on fuel supply is opened by fuel station operator, set D1 adapter valve lever to OPEN position.
- (14) Open V17 GRAVITY VALVE.

**Performance Steps**

- (15) Open V18 BULK DEL VALVE.
- (16) Push PUMP ENGAGEMENT LEVER forward.
- (17) Set TC/THROTTLE CONTROL switch up to ON position.
- (18) Press HI/HIGH IDLE switch.
- (19) Pull out HAV HAND ACTUATED CONTROL valve.

NOTE: HAV HAND ACTUATED CONTROL valve must be open for fuel to flow.

- (20) Squeeze and hold lever to open HAV HAND ACTUATED CONTROL valve. As soon as fuel starts flowing, open V12 B/L PRECHECK VALVE. If fuel flow stops within approximately 15 seconds, close V12 B/L PRECHECK VALVE and continue fuel loading.

**CAUTION**

Do not continue fuel loading if fuel flow does not stop within about 15 seconds after V12 B/L PRECHECK VALVE is opened or tanker may be damaged.

- (21) When tank is full and fuel flow stops automatically, let go of HAV HAND ACTUATED CONTROL valve lever.
- (22) Pull back on PUMP ENGAGEMENT LEVER until locked.

**CAUTION**

Guide hoses back onto reel. Carefully guide control through access hole onto reel. Failure to do so may result in equipment damage.

- (23) Rewind HAV HAND ACTUATED CONTROL valve hoses onto reel.
- (24) Set TC/THROTTLE CONTROL switch down to OFF.
- (25) After fuel station operator shuts off fuel flow from fuel supply, close V18 Bulk DEL VALVE.
- (26) Close V17 GRAVITY VALVE. Disconnect fuel station suction hose from B GRAVITY RECEPTACLE. Drain fuel from fuel station suction hose and dispose of fuel in accordance with unit SOP.
- (27) Disconnect fuel station suction hose from fuel supply.
- (28) Set D1 adapter valve lever to CLOSE position.
- (29) Remove D1 adapter from A B/L RECEPTACLE. Drain fuel from fuel station suction hose and dispose of fuel in accordance with unit SOP.
- (30) Disconnect 3-inch adapter coupling from D1 adapter. Disconnect suction hose from C BULK RECEPTACLE (UNFIL).
- (31) Remove 3-inch adapter coupling from suction hose. Stow 3-inch adapter coupling and D1 adapter. Stow suction hose and return fuel station suction hose to fuel station operation.
- (32) Install dust caps on A B/L, B GRAVITY, and C BULK RECEPTACLES.
- (33) Perform after-operations PMCS according to TM 9-2320-279-10-1. Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by operator. Inform your supervisor if system is found to be NMC.
- (34) Disconnect and rewind SR1 and SR2 static cables and close pump module rear doors.
- (35) Set PTO ENGAGE switch to OFF. Check that indicator light goes out.
- (36) Shut off engine.

**Performance Steps**

- c. Top load tank with tanker fuel pump.

**WARNING**

**Top loading will be done in emergency situations only (when bottom loading is not possible and only by order of unit commander). Top loading causes static electricity and vapors. To prevent fire or explosion, no smoking, flame, sparks, and glowing or hot objects are allowed within 50 feet (15 m) of vehicle. Fire or explosion may cause personal injury or death. To prevent explosion caused by electrostatic charge, ground self and equipment before opening manhole cover.**

- (1) Position tanker controls.
- (2) Ensure pump module rear doors are closed.
- (3) Connect SR1 and SR2 static cables to fuel source and to grounding devices.
- (4) Open manhole cover.

**WARNING**

**Open manhole cover slowly to relieve pressure. If there is a pressure buildup, personnel may be injured.**

- (5) Place fill stand downspout in manhole fill opening or place hose through manhole fill opening so that it touches bottom of tank.
- (6) After fuel station operator fills tank to desired level and stops fuel flow, remove fill stand downspout or hose from manhole fill opening and close manhole cover and secure latch.
- (7) Disconnect and rewind SR1 and SR2 static cables.
- (8) Stow fire extinguishers.

**Performance Steps**

- d. Load vehicle or aircraft over wing fuel servicing.
  - (1) Prepare vehicle.

**WARNING**

**No smoking, flame, sparks, and glowing or hot objects are allowed within 50 feet of vehicle. Fire or explosion may cause personal injury or death.**

**CAUTION**

Do not run tanker without fuel in system. This may cause damage to fuel pump and hydraulic motor. Do not press accelerator during tanker primary fuel pump operation. Engine speeds higher than 1,500 RPM may cause damage to hydraulic motor and primary pump. Drain and flush tank compartment, filter separator, and piping system with new product when changing to different fuel or different grades of fuel from last one carried. Notify organizational maintenance to change all filter elements. Failure to do so may result in equipment damage.

- (a) Start engine and position vehicle for fuel servicing.
  - (b) Park vehicle according to TM.
  - (c) If vehicle is equipped with self recovery winch, check that PTO ENGAGE switch is set to OFF.
  - (d) If vehicle is equipped with self recovery winch, push in SELECTOR VALVE for tanker pump operation.
  - (e) Set PTO engage switch to ON position.
  - (f) Open pump module rear doors.
  - (g) Position tanker controls.
  - (h) Connect static cables to vehicle being serviced and to grounding devices (bond and ground).
  - (2) Fuel servicing.
    - (a) Disengage hose reel tension knob.
    - (b) Remove rubber tie down strap to release fuel service nozzle from stowage position.
    - (c) Remove dust cap from end of hose.
    - (d) Pull hose completely out from hose reel.
    - (e) Engage hose reel tighten knob.
    - (f) Remove fuel service nozzle or over wing nozzle from stowage.
    - (g) Remove reducer adapter from storage and install reducer adapter on hose.
    - (h) Install fuel service nozzle or over wing nozzle on hose or reducer adapter.
      - (i) Push in V-6 FUEL/DEFUEL VALVE control rod.
      - (j) Pull back MC MANUAL CONTROL EM VALVE lever.
    - (k) Adjust V7 REEL VALVE to control rate of fuel delivery through the hose.
      - (l) Push PUMP ENGAGEMENT LEVER forward.
    - (m) Set TC/THROTTLE CONTROL switch up to ON position.
    - (n) Press HI/HIGH IDLE switch.
    - (o) Pull out HAV HAND ACTUATED CONTROL valve.
    - (p) Remove fuel filler cover from receiving vehicle or aircraft.
- NOTE: HAV HAND ACTUATED CONTROL valve must be open for fuel to flow.
- (q) Insert fuel service nozzle or over wing nozzle through fuel filler of receiving vehicle or air craft.

**Performance Steps**

- (r) Squeeze and hold lever to open HAV HAND ACTUATED CONTROL valve.
- (s) Squeeze and hold lever on fuel service nozzle or lever on over wing nozzle to start fuel flow.
- (t) When filled to desired level, release lever and HAV HAND ACTUATED control valve lever.
- (u) Remove fuel servicing nozzle or over wing nozzle from receiving vehicle or aircraft filler.
- (v) Install fuel filler cover on receiving vehicle or aircraft.

NOTE: Tanker must have at least 300 gallons of fuel remaining in order to perform fuel hose evacuation.

- (w) Pull out V6 FUEL/DEFUEL VALVE control rod. Squeeze and hold lever to open HAV HAND ACTUATED CONTROL valve.
- (x) Squeeze and hold lever on fuel service nozzle or lever on over wing nozzle to evacuate fuel from hose. Dispose of fuel accordance with unit SOP. When all fuel is evacuated from hose, release lever and lever on HAV HAND ACTUATED CONTROL valve.
- (y) Let HAV HAND ACUATED CONTROL valve hose rewind onto reel and stow inside pump module.
- (z) Set TC/THROTTLE CONTROL switch down to OFF position.
  - (aa) Pull back on PUMP ENGAGE LEVER until locked.
  - (bb) Push MC MANUAL CONTROL EM valve lever forward.
  - (cc) Close V7 REEL VALVE.
  - (dd) Place fuel service nozzle in stowage position and secure with rubber tie down strap.
  - (ee) Remove fuel service nozzle or over wing nozzle from adapter.

NOTE: Reducer adapter is used with over wink nozzle only. If over wing nozzle was not used skip step (ff).

- (ff) Remove reducer adapter from hose.
  - (gg) Put fuel service nozzle or over wing nozzle and reducer adapter in stowage.
  - (hh) Remove crank from stowage.
  - (ii) Release hose reel tension knob.
  - (jj) Put crank on crank shaft, turn crank to rewind hose onto reel.
  - (kk) Install dust cap on end of hose.
  - (ll) Engage hose reel tension knob.
  - (mm) Return crank to stowage.
  - (nn) Disconnect and rewind SR1 and SR2 static cables.
  - (oo) Perform after-operations PMCS according to TM 9-2320-279-10-1. Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by the operator. Inform supervisor if the system is found to be NMC.
  - (pp) Close pump modular rear doors.
  - (qq) Set PTO ENGAGE switch to OFF position.
  - (rr) Shut off engine.
- e. Recirculate fuel.
- (1) Prepare vehicle.
    - (a) Start the engine and park vehicle.
    - (b) If vehicle is equipped with a self recovery winch, check that PTO ENGAGE switch is set to OFF.

## Performance Steps

### CAUTION

Do not move SELECTOR VALVE while PTO is engaged or vehicle hydraulic equipment may be damaged.

- (c) If vehicle is equipped with a self recovery winch, push in SELECTOR VALVE for tanker pump operation.
- (d) Set PTO ENGAGE switch to ON position. The indicator light should come on.
- (e) Open pump module rear doors.

### WARNING

**Stand clear to avoid injury when opening pump module rear doors. When doors are about halfway open, gas pistons push doors open quickly and with much force.**

- (f) Position tanker controls.
  - (g) Connect SR1 and SR2 static cables to grounding devices.
  - (h) Remove dust cap from A B/L RECEPTACLE.
    - (i) Remove dust cap from hose.
    - (j) Disengage the hose reel tension knob.
    - (k) Pull out about 15 feet of hose from the reel.
    - (l) Engage hose reel tension knob.
  - (m) Remove D1 adapter from stowage.
  - (n) Connect D1 adapter to A B/L RECEPTACLE.
  - (o) Connect hose to D1 adapter.
- (2) Recirculate fuel.
- (a) Push in V6 FUEL/DEFUEL valve control rod.
  - (b) Pull back MC MANUAL CONTROL EM VALVE lever.
  - (c) Push PUMP ENGAGEMENT LEVER forward.
  - (d) Set TC/THROTTLE CONTROL switch up to ON position.
  - (e) Press HI/HIGH IDLE switch.
  - (f) Open V7 REEL VALVE.
  - (g) Pull out HAV HAND ACTUATED CONTROL valve.
  - (h) Pull out HAV HAND ACTUATED CONTROL valve.

NOTE: The HAV HAND ACTUATED CONTROL valve must be open for fuel to flow.

- (i) Squeeze and hold HAV HAND ACTUATED CONTROL valve lever to recirculate fuel.
- (j) When re-circulation is completed, release HAV HAND ACTUATED CONTROL valve lever.
- (k) Move D1 adapter valve lever to CLOSE position.

NOTE: Tanker must be holding at least 300 gallons of fuel in order to perform fuel hose evacuation.

- (l) Pull out V6 FUEL/DEFUEL VALVE control rod.
  - (m) Close V7 Reel VALVE.
- (3) Shut down recirculation.
- (a) Disconnect D1 adapter from A B/L RECEPTACLE.
  - (b) Disconnect hose from D1 adapter.
  - (c) Stow D1 adapter.
  - (d) Squeeze and hold HAV HAND ACTUATED CONTROL valve lever to evacuate fuel from hose. Dispose of fuel according to unit SOP.
  - (e) When all fuel is emptied from hose, release HAV HAND ACTUATED CONTROL valve lever.



**Performance Steps**

- (f) Install dust cap on A B/L RECEPTACLE.
  - (g) Set TC/THROTTLE CONTROL switch down to OFF position.
  - (h) Pull back on PUMP ENGAGEMENT LEVER until locked.
  - (i) Push MC MANUAL CONTROL EM VALVE lever forward.
  - (j) Rewind HAV HAND ACTUATED CONTROL valve hoses onto reel and stow inside pump module.
  - (k) Remove crank from stowage on pump module.
  - (l) Release hose reel tension knob.
  - (m) Put crank on crankshaft.
  - (n) Turn crank to rewind hose on reel.
  - (o) Install dust cap on hose.
  - (p) Engage hose reel tension knob.
  - (q) Return crank to stowage.
  - (r) Perform after-operations PMCS according to TM 9-2320-279-10-1. Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by operator. Inform your supervisor if system is found to be NMC.
  - (s) Disconnect and rewind SR1 and SR2 static cables.
  - (t) Close pump module rear doors.
  - (u) Set PTO ENGAGE switch to OFF position. The indicator light should go out.
  - (v) Shut off engine.
- f. Unload fuel.
- (1) Filter bulk unloading.
    - (a) Start engine and position vehicle for bulk unloading.
    - (b) Park vehicle.
    - (c) If vehicle is equipped with self recovery winch, check that PTO ENGAGE switch is set to OFF.

**CAUTION**

Do not move SELECTOR VALVE while PTO is engaged or vehicle hydraulic equipment may be damaged.

- (d) If vehicle is equipped with self recovery winch, push in SELECTOR VALVE for tanker pump operation.
- (e) Set PTO ENGAGE switch to ON position. Indicator light should come on.
- (f) Open pump module rear doors.
- (g) Position tanker controls.
- (h) Connect static cables to vehicle being serviced and to the grounding devices (bond and ground).
- (i) Remove dust cap from C Bulk RECEPTACLE.
- (j) Open stowage tube cover and remove suction hose. Connect one end of suction hose to C BULK RECEPTACLE and other end to receiving receptacle.
- (k) Pull back MC MANUAL CONTROL EM VALVE lever.
- (l) Open V18 BULK DELIVERY VALVE.
- (m) Push PUMP ENGAGEMENT LEVER forward.
- (n) Pull out HAV HAND ACTUATED CONTROL valve.
- (o) Set TC/THROTTLE CONTROL switch up to ON position.
- (p) Press HI/HIGH IDLE switch.

NOTE: HAV HAND ACTUATED CONTROL valve must be open for fuel to flow.

- (q) Squeeze and hold HAV HAND ACTUATE CONTROL valve lever to unload fuel.
- (r) When unloading is finished, release HAV HAND ACTUATED CONTROL valve lever.
- (s) Set TC/THROTTLE CONTROL switch down to OFF position.
- (t) Pull back on PUMP ENGAGEMENT LEVER until locked.
- (u) Push MC MANUAL CONTROL EM VALVE lever forward.

### Performance Steps

- (v) Close V18 BULK DELIVERY VALVE.

#### **CAUTION**

Guide hoses back onto reel. Carefully guide control through access hole onto reel. Failure to do so may result in equipment damage.

- (w) Rewind HAV HAND ACTUATED CONTROL valve hoses and stow in pump module.

NOTE: Remove remaining fuel in suction hose by walking out suction hose.

- (x) Remove suction hose drain fuel and dispose of fuel in accordance with unit SOP. Stow suction hose. Install dust cap on C BULK RECEPTACLE.
- (y) Perform after-operations PMCS according to TM 9-2320-279-10-1. Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by operator. Inform your supervisor if system is found to be NMC.
- (z) Disconnect and rewind SR1 and SR2 static cables.
- (aa) Close pump module rear doors.
- (ab) Set PTO ENGAGE switch to OFF position. Indicator light should go out.
- (ac) Shut off engine.
- (2) Unfiltered gravity bulk unloading.
  - (a) Prepare tanker for operation.
    1. Perform before-operations PMCS according to TM 9-2320-279-10-1. Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by operator. Inform your supervisor if system is found to be NMC.
    2. Position controls.
      - aa. Push MC MAMUAL CONTROL EM VALVE lever full forward and down.
      - bb. Push V6 FUEL/DEFUEL VALVE full into fueling position.
      - cc. Close VII FLOW VALVE (REG).
      - dd. Push V8 REEL VALVE (H2) straight up to close.
      - ee. Close V18 BULK DEL VALVE.
      - ff. Close V15 DRAIN VALVE.
      - gg. Turn flow meter reset knob to zero scale.
      - hh. Set TC/THROTTLE CONTROL switch down to OFF position.
      - ii. Set TL1/TANK LEVEL INDICATOR switch down to OFF position.
      - jj. Set APC/AUXILIARY PUMP CONTROL switch APC to shut off.
      - kk. Pull back on PUMP ENGAGEMENT LEVER until locked.
    - ll. Close V17 GRAVITY VALVE.
    - mm. Close V12 B/L PRECHECK VALVE.
    - nn. Close V7 REEL VALVE (H1).
    - oo. Move V3 SUCTION LINE VALVE handle to OPEN position.
  - (b) Place grounding rod in ground according to FM 10-67-1. Connect static line from HEMTT to grounding rod.

NOTE: Both vehicles and equipment involved must be bonded and grounded before performing fueling procedures.

- (c) Position fire extinguisher within five to ten feet of the operation.
- (d) Gauge fuel gauge:
  1. Open right side pump module rear door.
  2. Set TL1/TANK LEVEL INDICATOR switch to ON.
  3. Read tank fuel level on indicator gauge.

NOTE: If TL1/TANK LEVEL INDICATOR gauge does not show fuel level reading, check fuel level with dipstick according to TM 9-2320-279-10-1.

4. Set TL1/TANK LEVEL INDICATOR switch to OFF.
  5. Close right side pump module rear door.
- (e) Connect SR1 and SR2 static cables to equipment receiving fuel and to grounding devices.

**Performance Steps**

- (f) Remove dust cap from B GRAVITY RECEPTACLE.
- (g) Open stowage tube cover and remove suction hose.

NOTE: B GRAVITY RECEPTACLE is designed for a 4-inch hose. Use an Army supplied hose for gravity discharge of fuel.

- (h) Connect one end of suction hose to B GRAVITY RECEPTACLE and the other end to receiving receptacle.
- (i) Pull back MC MANUAL CONTROL EM VALVE lever.
- (j) Open V17 GRAVITY VALVE to unload fuel. When unloading is finished, close V17 GRAVITY VALVE.
- (k) Push MC MANUAL CONTROL EM VALVE lever forward. Remove suction hose, drain fuel, and dispose of fuel in accordance with unit SOP. Stow suction hose.

NOTE: Remove remaining fuel in suction hose by walking out suction hose.

- (l) Install dust cap on B GRAVITY RECEPTACLE. Disconnect and rewind SR1 and SR2 static cables.
- (m) Close pump module rear doors.

11. Perform operator's maintenance and load, unload, and dispense products from M131A5C and M900-series tank vehicles (M967, M969, and M970).

- a. Perform PMCS on tanker vehicles. See Table 3-8 for a generic PMCS chart. Consult the most current TM for details of checks and services.
- b. Load, unload, and dispense products from the M131A5C according to TM 9-2330-272-14.

NOTE: Load capacity for highway driving is 5,000 gallons evenly divided between the two compartments. For cross country driving, it is 3,000 gallons evenly divided.

- (1) Top loading using outside pump and 3-inch suction hose.

### WARNING

**Top load only during emergency situations by order of the unit commander. Top loading greatly increases vapors and static electricity. It also greatly increases chance of explosion, fire, and environmental pollution.**

- (a) Bond and ground the semitrailer.
- (b) Open filler cover on tank compartment you are going to load.
- (c) Put hose or drop tube in compartment so that it touches bottom of tank.
- (d) Start outside pump and fill tank compartment.
- (e) After you have completed loading operation, stop outside pump and remove hose or drop tube, then close filler cover and valves.
- (f) Remove bonding and grounding wires.
- (2) Top loading using vehicle pump and 3-inch suction hose.
  - (a) Use a 3-inch suction hose to form a line between pump intake valve on semitrailer and source of supply. Use as many hose sections as you need from either tank semitrailer or issue point.
  - (b) Open filler cover on tank compartment you are going to load.
  - (c) Connect a 3-inch suction hose to pump discharge valve. Put other end of hose through filler cover so that it touches bottom of tank. If you place this hose in another container or tank vehicle, it is called a TRANSFER operation.
  - (d) Start auxiliary engine and pump assembly:
    - 1. Pull out choke control, and open valve on fuel tank.
    - 2. Turn on both panel power switch and ignition switch.
    - 3. Push starter button. If engine does not start in about five seconds, release button. Wait a few seconds, and then push it again. Do this no more than three times. If engine does not start, notify organizational maintenance.

**Performance Steps**

4. After engine is warm, check for leaks and loose connections. If you see any, fix them immediately. If operator cannot fix them, he/she should notify organizational maintenance.
  5. To prevent overheating, keep equipment cabinet doors open while auxiliary engine is running.
  6. To stop auxiliary engine and pump assembly, simply turn off ignition switch and panel power switch.
- (e) When the auxiliary engine and pump assembly are running smoothly, open the pump intake valve and the pump discharge valve in that order. The product will then flow into the tank compartment.
  - (f) When you have completed loading operation, shut off auxiliary engine. Close all valves and filler covers.
  - (g) Disconnect, drain, and stow all 3-inch suction hoses.
  - (h) Remove bonding and grounding wires.

**Table 3-8. Tanker Preventive Maintenance Chart**

<i>ITEM</i>	<i>PROCEDURE</i>	<i>BEFORE OPERATION</i>	<i>DURING OPERATION</i>	<i>AFTER OPERATION</i>
Auxiliary Engines	Inspect for leaks and cracks in the fuel, oil, and exhaust lines.	X	X	X
	Check for unusual noises.	X		
	Check the level of oil and fuel.	X		X
	Inspect fuel shutoff valve and sediment bowl for leaks, dirt, and damage.	X		X
Battery	Inspect for tight connection and corroded terminals. Check the electrolyte.	X		X
Filter/Separator	Inspect for leaks and damage.	X	X	X
	Check the pressure differential each time you use the vehicle.	X		
Filter/Separator	Open the valve and drain water. Leave Dump Valve or valve open until fuel appears.	X		X
Fire Extinguisher	Manual Drain Valve Inspect the controls, nozzles, tubes, connections, and mounting for leaks, corrosion, and damage. Check date of last weight test. Have the extinguisher weight tested if necessary.	X		

- (3) Bottom loading using an outside pump and 3-inch suction hose.
  - (a) Bond and ground vehicle.
  - (b) Use a 3-inch suction hose to form a line between gravity discharge valve on semitrailer and source of supply. Use as many hose sections as you need from either vehicle or issue point.
  - (c) Open tank compartment discharge valve, manifold valve, and filler cover of tank compartment you are going to fill.
  - (d) Open gravity discharge valve and start outside pump. Product will then flow into tank compartment.
  - (e) When compartment is full, open tank compartment discharge valve, manifold valve, and filler cover of next compartment you are going to load. Top off first compartment by slowly closing its manifold valve. When the manifold valve is completely closed, shut tank compartment discharge valve and filler cover.

**Performance Steps**

- (f) When you have completed loading operation, stop outside pump. Close all valves and filler covers.
- (g) Disconnect, drain, and stow all 3-inch suction hoses.
- (h) Remove bonding and grounding wires.
- (4) Bottom loading using vehicle pump and 3-inch suction hose.
  - (a) Bond and ground semitrailer.
  - (b) Use a 3-inch suction hose to form a line between pump intake valve on semitrailer and source of supply. Use as many 3-inch hose sections as you need from either tank vehicle or issue point.
  - (c) Open tank compartment discharge valve, manifold valve, and filler cover of tank compartment you are going to load. Then push in four-way valve lever.
  - (d) Start auxiliary engine and pump assembly as described in this task.
  - (e) After auxiliary engine is running smoothly, open pump intake valve. The product will then start to flow into tank compartment.
  - (f) When compartment is full, open tank compartment discharge valve, manifold valve, and filler cover of next compartment you are going to load. Top off first compartment by slowly closing its manifold valve. After manifold valve is completely closed, close tank compartment discharge valve and filler cover.
  - (g) When you have completed loading operation, shut off auxiliary engine. Close all valves and filler covers.
  - (h) Disconnect, drain, and stow all 3-inch suction hoses.
  - (i) Remove bonding and grounding wires.
- (5) Bottom loading using vehicle pump and 2 1/2-inch discharge hose.
  - (a) Bond and ground semitrailer.
  - (b) Remove standard spout from 2 1/2-inch discharge hose nozzle and put on defueling spout.
  - (c) Loosen 225-GPM hose reel brake. Unwind as much hose as you need and place 2 1/2-inch nozzle in container, vehicle, or aircraft you are defueling.
  - (d) Open tank compartment discharge valve, manifold valve, and filler cover of tank compartment you are going to load. For accountability in defueling operations, always load the product into an empty compartment or one that you have accurately gauged. See FM 10-67-1 for tank vehicle gauging procedures.
  - (e) Open defuel cutoff valve and 225-GPM cutoff valve. Then push in four-way valve operating lever.
  - (f) Start auxiliary engine and pump assembly as described in this task.
  - (g) When auxiliary engine is running smoothly, squeeze 2 1/2-inch nozzle operating lever, and fill tank compartment.
  - (h) After you have completed defueling operation, shut off auxiliary engine. Close all valves and filler covers.
    - (i) Rewind 2 1/2-inch discharge hose and lock hose reel. Remove defueling spout from nozzle and replace it with standard spout.
    - (j) Remove bonding and grounding wires.
- (6) Unload M131A5C by gravity discharge using a 3-inch suction hose (product is not filtered or metered by vehicle).
  - (a) Bond and ground semitrailer.
  - (b) Use a 3-inch suction hose to form a line between gravity discharge valve on semitrailer and receiving container. Use as many hose sections as you need from either tank vehicle or receiving container.
  - (c) Open tank compartment discharge valve, manifold valve, and filler cover of tank compartment you are going to empty.
  - (d) Open gravity discharge valve. Product will then start to flow from tank compartment.
  - (e) When you have completed unloading operation, close all valves and filler covers.
  - (f) Disconnect, drain, and stow all 3-inch hoses.
  - (g) Remove bonding and grounding wires.

**Performance Steps**

- (7) Pressure discharge using vehicle pump and 3-inch suction hose.
  - (a) Bond and ground semitrailer.
  - (b) Use a 3-inch suction hose to form a line between pump discharge valve on semitrailer and receiving container. Use as many 3-inch hose sections as you need from either tank vehicle or receiving point.
  - (c) Open tank compartment discharge valve, manifold valve, and filler cover of tank compartment you are going to unload. Pull out four way valve lever.
  - (d) Start auxiliary engine and pump assembly as described in this task.
  - (e) When auxiliary engine is running smoothly, open pump cutoff valve and pump discharge valve. Product will then start to flow into receiving container.
  - (f) When you have completed unloading operation, shut off auxiliary engine. Then close all valves and filler covers.
  - (g) Disconnect, drain, and stow all 3-inch hoses.
  - (h) Remove bonding and grounding wires.
- (8) Dispense product under pressure using vehicle pump and 2 1/2-inch discharge hose.
  - (a) Bond and ground semitrailer.
  - (b) Loosen 225-GPM hose reel brake. Unwind as much 2 1/2-inch discharge hose as you need and place nozzle in receiving container.
  - (c) Open tank compartment discharge valve, manifold valve, and filler cover of compartment you are using to service item.
  - (d) Open 225-GPM cutoff valve and pump cutoff valve. Pull out four-way valve lever.
  - (e) Make sure meter counter is zero.
  - (f) Start auxiliary engine and pump assembly as described in this task.
  - (g) Squeeze 2 1/2-inch nozzle operating lever and fill container.
  - (h) When you have completed fuel service operation, shut off auxiliary engine. Then close all valves and filler covers.
  - (i) Rewind discharge hose and lock hose reel.
  - (j) Remove bonding and grounding wires.
- (9) Dispense product under pressure using vehicle pump and 1 1/2-inch discharge hose.
  - (a) Bond and ground semitrailer.
  - (b) Loosen 0 to 55-GPM hose reel brake. Unwind as much 1 1/2-inch discharge hose as you need and place nozzle in receiving container.
  - (c) Open tank compartment discharge valve, manifold valve, and filler cover of compartment you are using to fill receiving container.
  - (d) Set 0 to 55-GPM selector valve to flow rate you need for operation. Open pump cutoff valve and pull out four-way valve lever.
  - (e) Make sure meter counter is zero.
  - (f) Start auxiliary engine and pump assembly as described in this task.
  - (g) Squeeze 1 1/2-inch nozzle operating lever and fill container.
  - (h) When you have completed fuel service operation, shut off auxiliary engine. Then close all valves and filler covers.
  - (i) Rewind discharge hose and lock hose reel.
  - (j) Remove bonding and grounding wires.
- (10) Dispense fuel using gravity discharge and a 2 1/2-inch discharge hose (product is metered but not filtered by vehicle).
  - (a) Bond and ground semitrailer.
  - (b) Loosen 225-GPM hose reel brake. Unwind as much 2 1/2-inch discharge hose as you need and place nozzle in receiving container.
  - (c) Open tank compartment discharge valve, manifold valve, and filler cover of compartment you are using to service item.
  - (d) Open 225-GPM cutoff valve, defuel cutoff valve, and pump cutoff valve. Push in four-way valve lever.
  - (e) Make sure meter counter is on zero.
  - (f) Squeeze 2 1/2-inch nozzle operating lever and fill container.
  - (g) When you have completed fuel service operation, close all valves and filler covers.

**Performance Steps**

- (h) Rewind discharge hose and lock hose reel.
- (i) Remove bonding and grounding wires.
- c. Load, unload, and dispense products from 900-series (M967, M969, and M970) of fuel tankers according to TM 9-2330-356-14.
  - (1) Operate auxiliary engine and pump assembly on M967, M969, and M970 tank semitrailers.
    - (a) Park semitrailer on level ground and set brakes. Chock wheels by placing a wooden block in between front and rear tandem tires of rear axle.
    - (b) Bond and ground semitrailer.
    - (c) Turn engine switch to RUN.
    - (d) Turn preheater switch ON for about one minute. Be sure indicator light has come on.
    - (e) After one minute, continue to hold preheater switch and turn starter switch to START.
    - (f) Release starter switch and preheater switch after engine starts. Do not engage starter for more than 10 seconds at a time.
    - (g) Check gauges for correct indication. Stop engine if a system malfunction is indicated.
    - (h) After engine is warm, check for leaks and loose connections. If you see any, fix them at once or take vehicle to organizational maintenance.
    - (i) To stop auxiliary engine and pump assembly do the following:
      - 1. Throttle engine to fast idle (1,200 revolutions per minute [RPM]) for about five minutes before stopping to allow for gradual cooling of engine.
      - 2. Release throttle to low idle.
      - 3. Turn engine switch to STOP.
    - (j) Remove bonding and grounding wires.
  - (2) Top loading with a hose (product is not filtered or metered by vehicle).
    - (a) Be sure all valves are closed.
    - (b) Ground semitrailer. The loading hose from storage facility may have a metal fitting on free end and hose may not be bonded internally. Such a fitting is insulated and it could become charged. Bond and ground semitrailer before opening fill cover.
    - (c) Remove fire extinguishers and bring them to point of operation.
    - (d) Slowly open fill cover. Insert hose far enough to keep end of hose in contact with bottom of tank.
    - (e) Slowly begin flow and fill tank no further than to bottom of capacity indicator.
    - (f) Remove fill hose. Close and secure manhole cover.
    - (g) Drain accumulated water. Close all valves. Put container under manifold drain in piping control cabinet. Open emergency operator valve. Slowly open system drain valves.
    - (h) On M969 and M970 models, also drain filter separator. Open filter separator inlet valve. Put a container under filter separator drain valve. Slowly open valve. Allow filter separator to drain until fuel begins to flow. Close all valves.
    - (i) On M969 and M970 models, drain pilot lines. Open drain valves behind piping control assembly, behind emergency off take valve, and hose reel cabinet. Allow any water to drain into an appropriate container.
    - (j) Remove grounding wire. Store fire extinguishers.
  - (3) Bottom loading (product is not filtered by the vehicle).
    - (a) Be sure all valves are closed.
    - (b) Bond and ground vehicle.
    - (c) Remove cover from bottom loading connection and connect bottom loading hose to bottom loading connection.
    - (d) Remove fire extinguishers and bring them to point of operation.
    - (e) On M967 and M969, put selector valve in LOAD position.
    - (f) Open emergency valve operator.
    - (g) Begin flow from outside source.

**Performance Steps**

- (h) After flow has begun, open pre-check valve to pre-check shutoff float. Flow should stop after about 20 to 25 seconds to indicate that float is functional. If it is not working, stop all operations and notify higher maintenance.
- (i) Close pre-check valve. The flow will resume in about 20 seconds.
- (j) When tank is full, flow should stop automatically. Close all valves, replace all covers, and disconnect hoses.

NOTE: Be prepared to stop fuel supply at loading facility in event of shutoff float malfunction or if leaks or other unusual conditions are apparent.

- (k) Drain accumulated water in same manner as with top loading.
  - (l) Remove grounding wires.
  - (m) Store fire extinguishers.
- (4) Self loading using vehicle engine and pump (M967 and M969). Product is not filtered or metered by vehicle.
- (a) Be sure all valves are closed.
  - (b) Bond and ground vehicle.
  - (c) Remove fire extinguishers and bring them to point of operation.
  - (d) Start engine and pump assembly as described in this task. When engine is warm, adjust it to idle speed (1,000 to 1,200 RPM).
  - (e) Remove 4-inch bulk fuel hose from hose trough. Do this by disconnecting spring pins and turning hose through bars out of way.
  - (f) Remove dust cap from fuel outlets. Connect one end of bulk fuel hose to outlet and other end to storage facility.
  - (g) Put selector valve in LOAD position.
  - (h) Open operator valves, fuel outlet valve, and manifold outlet valve.
  - (i) Adjust engine throttle for desired flow rate.
  - (j) Shortly after flow has started, open pre-check valve to pre-check shutoff float. After about 20 to 25 seconds, flow should stop to let you know float is working properly. If it is not working, stop all operations and notify higher maintenance.
  - (k) Close pre-check valve. Flow will resume in about 20 seconds.
  - (l) When tank is full, flow should stop automatically.

**WARNING**

**In an emergency, close operator's valve or pull emergency valve shutoff on opposite side of semitrailer.**

- (m) At end of operation, idle down engine.
  - (n) Close all valves.
  - (o) Disconnect 4-inch bulk fuel hose and put in hose trough. Secure hose trough latches.
  - (p) Stop engine.
  - (q) Drain accumulated water in same manner as with top loading.
  - (r) Remove grounding wires.
  - (s) Store fire extinguishers.
- (5) Self loading using vehicle engine and pump (M970). Product is filtered and metered by vehicle.
- (a) Be sure all valves are closed.
  - (b) Open hose reel cabinet door. Pull release cable and lift the door with both hands.
  - (c) Bond and ground vehicle.
  - (d) Remove 4-inch bulk fuel hose from hose trough. Do this by disconnecting spring pins and turning hose trough bars out of way. Connect bulk fuel hose to outlet.
  - (e) Remove fire extinguishers and bring them to point of operation.



**Performance Steps**

- (f) Start engine and pump as described in this task. When engine is warm, adjust idle speed to 1,000 to 1,200 RPM.
- (g) Release lock on 2 1/2-inch hose reel and unreel hose fully.
- (h) Remove dust cap from bottom load adapter and connect underwing nozzle. Turn lever on side of nozzle to open nozzle.
- (i) Open operator valve, fuel outlet valve, manifold outlet valve, filter separator inlet valve, and hose reel inlet valve.
- (j) Unreel dead man control and squeeze lever. Meter inlet pressure gauge should read a minimum of 25 pounds per square inch (psi). Release dead man control. If gauge does not read a minimum of 25 psi, shut down operation and contact organizational maintenance personnel.
- (k) Adjust engine throttle for desired flow rate.
- (l) Squeeze and hold lever on dead man control. Shortly after flow has begun, turn pre-check valve D to OPEN position to pre-check automatic shutoff float. After about 20 to 25 seconds, flow should stop to indicate that float is working properly. If it is not working, stop all operations and notify higher maintenance.
- (m) Turn pre-check valve to CLOSED position. Free flow will resume in about 20 seconds.

**CAUTION**

In an emergency, release dead man control and flow should stop.

- (n) At end of operation, release dead man control and adjust engine to idle speed (1,000 to 1,200 RPM). Rewind dead man control hose.
  - (o) Close single point nozzle and disconnect the nozzle from the bottom load adapter.
  - (p) Reinstall dust caps on bottom load adapter and single point nozzle.
  - (q) Evacuate hose.
  - (r) Rewind 2 1/2-inch hose as described in this task and tighten hose reel lock.
  - (s) Close all valves and remove 4-inch bulk fuel hose connecting semitrailer to storage facility. Store hose in hose trough and secure trough latches.
  - (t) Reinstall dust cap on outlet.
  - (u) Shut off engine.
  - (v) Remove ground wire.
  - (w) Close hose reel cabinet door and latch it in place.
  - (x) Store fire extinguishers.
- (6) Unload 900 series trailers by gravity discharge using a 4-inch suction hose. Product is not filtered or metered by vehicle.
- (a) Be sure all valves are closed.
  - (b) Bond and ground vehicle.
  - (c) Remove 4-inch bulk delivery hose from trough. Do this by disconnecting spring pins and turning hose trough bars out of way.
  - (d) Remove dust cap from fuel outlet.
  - (e) Connect hose to outlet and storage facility.
  - (f) Remove fire extinguishers and bring them to point of operation.
  - (g) On M967 and M969, make sure selector valve is in UNLOAD position.
  - (h) Open operator valve, manifold inlet and outlet valves, and fuel outlet valve.
  - (i) At end of operation, close all valves.
  - (j) Disconnect hose, put it in hose trough, and secure hose trough latches.
  - (k) Reinstall dust cap on fuel outlet.
  - (l) Drain accumulated water in same manner as in loading procedure.
  - (m) Remove bonding and grounding wires.
  - (n) Store fire extinguishers.

## Performance Steps

12. Discharge product under pressure using vehicle pump and 4-inch suction hose. Product is not filtered or metered by vehicle.
  - a. Be sure all valves are closed.
  - b. Bond and ground vehicle and semitrailer.
  - c. Remove fire extinguishers and bring them to point of operation.
  - d. Start engine and pump as described in this task. When engine is warm, adjust throttle to idle speed (1,000 to 1,200 RPM).
  - e. Remove 4-inch bulk delivery hose from trough. Do this by disconnecting spring pins and turning hose trough bars out of way.
  - f. Remove dust cap from fuel outlet.
  - g. Connect hose to outlet and to storage facility.
  - h. On M967 and M969, put selector in UNLOAD position.
  - i. On M970, make sure selector valve is in CLOSED position.
  - j. Open operator valve, manifold inlet and outlet valve, and fuel dispensing nozzle.
  - k. Adjust engine throttle for desired flow rate.
  - l. At end of operation, idle down engine.
  - m. Close all valves, disconnect hose, and reinstall dust caps.
  - n. Put bulk fuel hose in hose trough and secure latches.
  - o. Stop engine.
  - p. Drain accumulated water in same manner as with loading procedure.
  - q. Remove bonding and grounding wire.
  - r. Store fire extinguishers.
13. Pressure discharge using vehicle pump and 4-inch hose (M969 and M970). Product is filtered but not metered by vehicle.
  - a. Be sure all valves are closed.
  - b. Bond and ground vehicle.
  - c. Remove 4-inch bulk delivery hose from trough. Do this by disconnecting spring pins and turning hose trough bars out of way.
  - d. Remove dust cap from fuel discharge nozzle.
  - e. Connect bulk fuel hose to outlet and to storage facility.
  - f. Remove fire extinguishers and bring them to point of operation.
  - g. Start engine and pump as described in this task. When engine is warm, adjust throttle to idle speed (1,000 to 1,200 RPM).
  - h. Put selector valve in UNLOAD position.
  - i. Open operator valve, manifold inlet and outlet valve, filter separator inlet valve, and fuel nozzle valve.
  - j. Adjust engine throttle for desired flow rate.

NOTE: Do not exceed 100 GPM through filter separator when pumping diesel fuel. Gasoline can be pumped at rates of up to 200 GPM.

  - k. At end of operation, adjust engine to idle speed (1,000 to 1,200 RPM).
  - l. Close all valves.
  - m. Remove hose and store in hose trough. Secure latches.
  - n. Reinstall dust cap on outlet.
  - o. Stop engine.
  - p. Remove bonding and grounding wires.
  - q. Store fire extinguishers.
14. Dispense non filtered using vehicle pump and 1 1/4-inch discharge hose (M969).
  - a. Be sure all valve are closed.
  - b. Bond and ground vehicle.

NOTE: If two vehicles are being serviced, make sure they are both grounded using separate static reels. The M969 is equipped with two static reels.

  - c. Remove fire extinguishers and bring them to point of operation.

**Performance Steps**

- d. Start engine and pump as described in this task. When engine is warm, adjust throttle to idle speed (1,000 to 1,200 RPM).
- e. Put selector valve in UNLOAD position.
- f. Open operator valve, fuel nozzle valve, fuel manifold inlet valve, and right side nozzle bank inlet valve.
- g. Reset meter to zero by pushing in reset knob and turning it clockwise.
- h. Open hose reel inlet valves.
- i. Adjust engine throttle for desired flow rate.
- j. Release lock on hose reel and unreel hose.
- k. Insert nozzle into vehicle fuel tank or container. Squeeze nozzle trigger to start flow.
- l. Release nozzle trigger. Remove nozzle from vehicle fuel tank or container at end of operation.
- m. Idle down engine to 1,000 to 1,200 RPM.
- n. Rewind hose as described in this task. Tighten hose reel lock.
- o. Close all valves.
- p. Stop engine.
- q. Remove bonding and grounding wires.
- r. Store fire extinguishers.

**CAUTION**

When using static ground cable reel, do not let go of static reel cable when rewinding until ball stop is firmly touching reel.

15. Dispense filtered using vehicle pump and 1 1/4-inch discharge hose (M969). Product is metered and filtered by vehicle.
  - a. Be sure all valves are closed.
  - b. Bond and ground vehicle.
  - c. Remove fire extinguishers and bring them to point of operation.
  - d. Start engine and pump as described in this task. When engine is warm, adjust idle speed to 1,000 to 1,200 RPM.
  - e. Put selector valve in UNLOAD position.
  - f. Open operator valve, manifold inlet valve, filter separator inlet valve, and appropriate hose inlet valves.
  - g. Reset meter to zero by pushing in reset knob and turning it clockwise.
  - h. Adjust engine throttle for proper flow rate.
    - i. Release lock on hose reel to be used. Unreel hose completely.
    - j. Insert nozzle into vehicle being serviced. Squeeze nozzle trigger to start flow.
    - k. Release nozzle trigger at end of operation and remove nozzle from vehicle.
    - l. Adjust engine to idle speed (1,000 to 1,200 RPM).
  - m. Rewind hose as described in this task. Tighten hose reel lock.
  - n. Close all valves.
  - o. Stop engine.
  - p. Remove bonding and grounding wires.
  - q. Store fire extinguishers.

## Performance Steps

### CAUTION

When using static ground cable reel, do not let go of cable when rewinding until ball stop is firmly touching reel.

16. Re-circulate using vehicle pump and 2 1/2-inch discharge hose (M970). Product is metered and filtered by vehicle.
  - a. Open hose reel cabinet door.
  - b. Be sure all valves are closed.
  - c. Remove fire extinguishers and bring them to point of operation.
  - d. Remove fire extinguishers and bring them to point of operation.
  - e. Release lock on 2 1/2-inch hose reel and unreel all of hose.
  - f. Remove dust cap from re-circulation fitting. Connect single point nozzle fitting.
  - g. Open single point nozzle by turning handle on side of nozzle.
  - h. Open operator valve, manifold inlet valve, filter separator inlet valve, and reel inlet valve.
  - i. Set engine throttle at desired flow rate.
  - j. Unreel dead man control.
  - k. Squeeze trigger on dead man control to start fuel flow. Meter inlet pressure gauge should indicate a minimum of 25 psi. If a minimum of 25 psi is not indicated, shut down operation and contact organizational maintenance personnel.

NOTE: Air source must be available for dead man operation.

- l. At end of operation, release dead man control and adjust engine to idle speed (1,000 to 1,200 RPM). Rewind dead man control.
    - m. Close single point nozzle. Disconnect nozzle from re-circulation fitting. Replace dust cap on fitting.
    - n. Evacuate hose as described in this task.
    - o. Rewind 2 1/2-inch hose as described in this task and tighten hose reel lock.
    - p. Close all valves and shut off engine.
    - q. Close hose reel cabinet door and latch it in place.
    - r. Store fire extinguishers.
17. Re-circulate using vehicle pump and 1 1/2-inch discharge hose (M970). Product is metered and filtered by vehicle.

- a. Open hose reel cabinet door.
  - b. Be sure all valves are closed.
  - c. Remove fire extinguishers and bring them to point of operation.
  - d. Start engine and pump as described in this task. When engine is warm, adjust idle speed to 1,000 to 1,200 RPM.
  - e. Release lock on 1 1/2-inch hose reel and unreel all hose.
  - f. Remove dust cap from re-circulation fitting and connect converter to fitting.
  - g. Open operator valve, manifold valve, filter separator inlet valve, and hose reel inlet valve.

NOTE: If 2 1/2-inch hose was used before 1 1/2-inch hose, depress and hold dead man release plunger in hose reel cabinet for five to ten seconds to deactivate dead man system. If this procedure is not followed, no fuel will flow to 1 1/2-inch hose.

- h. Set engine throttle at desired flow rate.
    - i. Squeeze trigger on over wing nozzle.
    - j. At end of operation, release trigger on over wing nozzle and adjust engine to idle speed (1,000 to 1,200 RPM).
    - l. Evacuate hose.
    - m. Rewind 1 1/2-inch hose reel as described in this task. Tighten hose reel lock.
    - n. Close all valves and shut off engine.
    - o. Remove converter from over wing nozzle and install spout to nozzle.

**Performance Steps**

- p. Close hose reel cabinet door and latch it in place. Do not slam door.
- q. Store fire extinguishers.

18. Dispense fuel at a single point underwing of aircraft using vehicle pump and 2 1/2-inch discharge hose (M970).

- a. Open hose reel cabinet door.
- b. Be sure all valves are closed.
- c. Bond and ground vehicle.
- d. Remove fire extinguishers and bring them to point of operation.
- e. Start engine and pump as described in this task. When engine is warm, adjust idle speed to 1,000 to 1,200 RPM.
- f. Open operator's valve, manifold valve, filter separator inlet valve, and hose reel inlet valve.
- g. Reset meter to zero by pushing in meter reset knob and turning it clockwise.
- h. Adjust engine throttle for desired flow rate.

NOTE: The breakaway fitting is a safety feature on the 2 1/2-inch hose reel. It consists of a breakaway coupling installed between hose and outlet port of hose reel. If aircraft is moved with single point nozzle attached to wing, coupling will break apart as hose is pulled tight against coupling. This prevents damage to aircraft.

- i. Release lock on 2 1/2-inch hose reel. Unreel all 50 feet of hose to ensure breakaway feature will be operable.

<p><b>WARNING</b></p> <p><b>Proper bonding of semitrailer to aircraft while it is being refueled is mandatory due to dangers of static electricity. Bond fuel nozzle ground wire to aircraft before bringing nozzle in contact with aircraft.</b></p>
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- j. Attach single point nozzle ground wire to aircraft.
- k. Connect single point nozzle to adapter on aircraft. Open nozzle by turning lever on side of nozzle.
- k. Disconnect over wing nozzle/converter from re-circulation fitting. Reinstall dust cap on fitting.
- l. Unreel dead man control hose. Activate dead man control by depressing control lever. Meter inlet gauge should read a minimum of 25 psi. If gauge does not read a minimum of 25 psi, shut down operation and contact organizational maintenance.
- m. Release dead man control at end of operation. Adjust engine to idle speed (1,000 to 1,200 RPM).
- n. Rewind dead man control hose.
- o. Close single point nozzle. Disconnect nozzle from aircraft, then disconnect nozzle ground wire.
- p. Evacuate hose as described in this task.
- q. Rewind 2 1/2-inch hose as described in this task.
- r. Close all valves and shut off engine.
- s. Remove bonding and grounding wires. Disconnect ground connection first from aircraft and then from grounding stud.
- t. Close hose reel cabinet door using both hands and then latch in place.
- u. Store fire extinguishers.

## Performance Steps

### CAUTION

When using static ground cable reel, do not let go of cable when rewinding until ball stop is firmly touching reel.

19. Dispense fuel close circuit over wing of an aircraft, using vehicle pump and 1 1/2-inch discharge hose (M970). Product is filtered and metered by vehicle. The over wing fuel dispensing operation is used and metered by vehicle. The over wing fuel dispensing operation is used to fuel winged aircraft through a fill port on top of the aircraft wings. The closed circuit fuel dispensing operation is used to fuel helicopters.
- Open hose reel cabinet door.
  - Be sure all valves are closed.
  - Bond and ground vehicle.
  - Remove fire extinguishers and bring them to point of operation.
  - Start engine and pump as described in this task. When engine is warm, adjust idle speed to 1,000 to 1,200 RPM.
  - Open operator valve, manifold valve, filter separator inlet valve, and hose reel valve.
  - Reset meter to zero by pushing in meter reset knob and turning it clockwise.

NOTE: If 2 1/2-inch hose was used before 1 1/2-inch hose, depress and hold dead man release plunger in hose reel cabinet for five to ten seconds to deactivate dead man system. If this procedure is not followed, no fuel will flow to 1 1/2-inch hose.

- Adjust engine throttle to desired flow rate.
- Release lock on 1 1/2-inch hose reel. Unreel hose far enough to reach aircraft.

### WARNING

**Proper bonding of semitrailer to aircraft while refueling is mandatory due to dangers of static electricity. Bond fuel nozzle ground wire to aircraft before bringing nozzle in contact with aircraft.**

- Before removing aircraft fill cap, attach nozzle ground wire to aircraft.
  - Insert over wing nozzle into fill port of aircraft or connect close circuit nozzle to helicopter.
  - Squeeze nozzle control handle on close circuit nozzle. Complete extension of red indicator indicates no flow.
  - At end of operation, release over wing nozzle trigger or return close circuit nozzle control handle to no flow position.
- NOTE: Do not disconnect nozzle ground wire before removing nozzle. Always remove nozzle first.
- Remove over wing nozzle or disconnect close circuit nozzle by pulling actuating cable loop.
  - Reinstall aircraft fill cover.
  - Evacuate hose.
  - Rewind 1 1/2-inch hose. Tighten hose reel lock.
  - Close all valves and shut off engine.
  - Remove bonding and grounding wires. Disconnect ground connection first from aircraft and then from grounding stud.
  - Close hose reel cabinet door using both hands and latch it in place.
  - Store fire extinguishers.

**Performance Steps****CAUTION**

When using static ground cable reel, do not let go of cable when rewinding until ball stop is firmly touching reel.

20. Defuel using vehicle pump and 1 1/2-inch or 2 1/2-inch discharge hose (M970). Product is metered and filtered by vehicle.

NOTE: A defueling hose must be available at site. The semitrailer does not include a defueling hose.

- a. Open hose reel cabinet door.
- b. Be sure all valves are closed.
- c. Remove fire extinguishers and bring them to point of operation.
- d. Start engine and pump as described in this task. When engine is warm, adjust idle speed to 1,000 to 1,200 RPM.
- e. Bond and ground vehicle.

**WARNING**

**Proper bonding of semitrailer to aircraft while it is being refueled is mandatory due to dangers of static electricity. Bond fuel nozzle ground wire to aircraft before bringing nozzle in contact with aircraft.**

- f. Release lock on the 1 1/2-inch or 2 1/2-inch hose reel. Unreel hose to full length.
- g. Remove dust cap on bottom load adapter and connect single point nozzle to adapter. Open single point nozzle by turning handle on side of nozzle.
- h. Remove dust cap from inlet and connect defueling hose to inlet.
  - i. Connect defueling hose ground wire to aircraft and then connect hose to aircraft.
  - j. Connect adapter to re-circulation fitting on tank vehicle.
- k. Open operator's valve, manifold valve, filter separator inlet valve, and hose reel inlet valve.
- l. Reset meter to zero by pushing in reset knob and turning it clockwise.

NOTE: If 2 1/2-inch hose was used before 1 1/2-inch hose, depress and hold dead man release plunger in hose reel cabinet for five to ten seconds to deactivate dead man system. If this procedure is not followed, no fuel will flow to 1 1/2-inch hose.

- m. Set engine throttle to desired flow rate.
- n. Unreel dead man control. Squeeze trigger on dead man control to start fuel flow. Meter inlet pressure gauge should indicate a minimum of 25 psi. If a minimum of 25 psi is not indicated, shut down operation and contact organizational maintenance personnel.
- o. Shortly after flow has begun, turn pre-check valve to OPEN position to pre-check automatic shutoff float. After about 20 to 25 seconds, flow should stop to indicate that float is working properly. If it is not working, stop all operations and notify higher maintenance.
- p. Turn pre-check valve to CLOSED position. The fuel flow will resume in about 20 seconds.

NOTE: When tank is full, flow should stop automatically.

- q. At end of operation, release dead man control and adjust engine to idle speed (1,000 to 1,200 RPM). Rewind dead man control hose.
- r. Remove defueling hose from aircraft and then remove hose ground wire. Disconnect defueling hose from inlet. Replace dust cap on inlet.
- s. Close single point nozzle and disconnect nozzle from bottom load adapter. Replace dust caps on adapter and nozzle.
- t. Evacuate hose as described in this task.
- u. Rewind hose as described in this task. Tighten hose reel lock.
- v. Close all valves and shut off engine.

**Performance Steps**

- w. Remove bonding and grounding wires. Disconnect ground connection first from aircraft and then from grounding stud.
- x. Close hose reel cabinet door and latch it in place. Do not slam door.
- y. Store fire extinguishers.

**CAUTION**

When using static ground cable reel, do not let go of cable when rewinding until ball stop is firmly touching reel.

21. Load and dispense petroleum products from M969A3 5,000 gallon tanker according to TM 9-2330-398-10.

- a. Bottom loading (non-filtered). Using self-contained overfill prevention system.
  - (1) Ensure all valves are closed.
  - (2) Ground semitrailer tank to fill rack ground.
  - (3) Hook up vapor recovery system if available. If vapor recovery system is not available, open vapor recovery outlet slowly on opposite side of loading operation. This will let fumes vent away from operator while loading.
  - (4) Remove cover from bottom loading connection. Connect bottom loading hose to bottom loading connection.
  - (5) Bring fire extinguisher to point of operation.
  - (6) Open valve D and begin flow.

**WARNING**

**When filling tank by means of bottom loading, a test of pre-check system is mandatory. If this system is not functioning, stop all operations. Determine problem and have it corrected by a qualified technician. Failure of automatic shutoff to function may result in uncontrolled fuel spillage and danger of fire and explosion.**

- (7) After flow has begun, close valve D to pre-check shutoff float. If float is functional, flow should stop after about 20 to 25 seconds.
- (8) Open D valve. Flow should resume in about 20 seconds.
- (9) When tank is full, flow should stop automatically. Close all valves, disconnect hoses, and replace all covers.
- (10) Drain accumulated water.
  - (a) Ensure all valves are closed.
  - (b) Put a container under manifold drain in piping control cabinet. Open emergency valve A. Slowly open valves H and J. Allow fuel to drain until pure fuel begins to flow.
  - (c) Close valves H, J, and emergency valve A.
  - (d) Remove grounding wires, store, and cover fire extinguisher.
- b. Bottom loading using rack monitored electronic overfill prevention system.
  - (1) Ensure all valves are closed.
  - (2) Ground semitrailer tanker.



**Performance Steps****WARNING**

**Always stand to side when opening vapor recovery outlet.**

- (3) Hook up vapor recovery system if available. If vapor recovery system is not available, open vapor recovery outlet on opposite side of loading operation. This will let fumes vent away from operator while loading.
  - (4) Remove cover from bottom loading connection. Connect rack's bottom loading hose to bottom loading connection.
  - (5) Bring fire extinguisher to point of operation.
  - (6) Connect overfill prevention cable at terminal to proper overfill socket on tank. Check Civacon monitor for errors and make sure Green permit light is lit.
  - (7) Open valve D and begin flow.
  - (8) After flow has begun, close valve D to pre-check shutoff float. If float is functional, flow should stop after about 20 to 25 seconds.
  - (9) Open valve D. Flow should resume in about 20 seconds.
  - (10) When tank is filled, close valve D, disconnect hoses and overfill prevention cable, and replace all covers.
  - (11) Drain accumulated water.
    - (a) Ensure all valves are closed.
    - (b) Put container under manifold drain in piping control cabinet. Open emergency valve A.
    - (c) Slowly open valves H and J. Allow fuel to drain until pure fuel begins to flow.
    - (d) Close valves H, J, and emergency valve A.
    - (e) Remove grounding wires, store, and cover fire extinguishers.
22. Gravity unload M969A3.
- a. Ensure all valves are closed.
  - b. Connect grounding wire to storage facility and grounding stud on semitrailer.
  - c. Remove 4-inch bulk delivery hose(s) from tanker hose tube.
  - d. Remove dust cover from outlet B and connect hose to outlet B and to storage facility.
  - e. Open vapor recovery outlet cap on vapor recovery line to allow airflow into tank during unloading process.
  - f. Remove fire extinguishers and bring to point of operation.
  - g. Open valves A, H, G, and B to begin flow.
  - h. At the end of operation, close all valves. Disconnect hose and put it in hose tube. Secure hose tube latch.
  - i. Reinstall dust cover on outlet B. Reinstall cap on vapor recovery outlet.
  - j. Drain accumulated water.
    - (1) Ensure all valves are closed.
    - (2) Put a container under manifold drain in piping control cabinet. Open emergency valve A.
    - (3) Slowly open valves H and J. Allow to drain until pure fuel begins to flow.
    - (4) Close valves H, J, and emergency valve A.
  - k. Remove grounding wires.
  - l. Store and cover fire extinguisher.
23. Self load non-filtered fuel servicing involving use of engine and pump.
- a. Ensure all valves are closed.
  - b. Connect static reel to storage facility. Bring fire extinguisher to point of operation.
  - c. Start engine. When engine is warm, adjust to idle speed (1,000 to 1,200 RPM).
  - d. Remove 4-inch bulk fuel hose from hose tube.
  - e. Remove dust cover from outlet B and connect bulk fuel hose to outlet and storage facility.
  - f. Open vapor recovery outlet.

### Performance Steps

- g. Open valves B, E, D, and G.
  - h. Adjust engine throttle for desired flow rate.
  - i. Shortly after flow has started, close valve D to pre-check the shutoff float. If float is functional, flow should stop after 20 to 25 seconds.
  - j. Open valve D. Flow will resume in about 20 seconds.
  - k. When tank is full, flow should stop automatically.
  - l. At end of operation, idle down engine. Close all valves. Disconnect 4-inch bulk fuel hose(s) and put them in hose tube. Secure hose tube latches.
  - m. Stop engine.
  - n. Drain accumulated water in same manner as with top loading.
  - o. Remove grounding wire, store, and cover fire extinguishers
24. Hose evacuation (M969A3 only). Purging or removing fuel from dispensing system must be done after every operation that uses dispensing hoses. Use following procedures to purge hoses.
- a. Ensure all valves are closed.
  - b. Bring fire extinguishers to point of operation.
  - c. Start engine and when warm, adjust to idle speed (1,000 to 1,200 RPM).
  - d. Open valves A, G, E, and K. Open valve P or R (whichever was used) to evacuate the 1 1/4-inch hose.
  - e. Set engine throttle to maximum speed (2,400 RPM) for a few seconds until evacuation is completed (meter turns backward slowly until fuel is evacuated).
  - f. Idle down engine. Close all valves. Stop engine.
  - g. Store and cover fire extinguishers.
25. Non-filtered dispensing.
- a. Ensure that all valves are closed.
  - b. Unreel static reel cable and connect it to a suitable ground and to automotive unit/container. Bring fire extinguishers to point of operation.
  - c. Start engine. When engine is warm, adjust throttle to idle speed (1,000 to 1,200 RPM).
  - d. Remove cap on vapor recovery outlet.
  - e. Open valves A, H, F, and K.
  - f. Open hose reel cabinet door. Reset meter to zero by pushing reset knob and turning clockwise.
  - g. Unreel dispensing hose that you are using. Open corresponding valve P or R of hose being used. Make sure fuel dispensing nozzle is on end of hose being used.
  - h. Adjust engine throttle for desired flow rate.
  - i. Insert nozzle into vehicle fuel tank/container. Squeeze nozzle trigger to start flow.
  - j. At the end of operation, release nozzle trigger and remove nozzle from vehicle fuel tank/container.
  - k. Idle down engine to 1,000 to 1,200 RPM.
  - l. Close all valves.
  - m. Evacuate hose(s).
    - (1) Ensure all valves are closed.
    - (2) Open valves A, G, E, and K. Open valve P or R (whichever was used) to evacuate the 1 1/4-inch hose.
    - (3) Set engine throttle to maximum speed (2,400 RPM) for a few seconds until evacuation is completed (meter turns backward slowly until fuel is evacuated).
    - (4) Idle down engine. Close all valves.
    - (5) Rewind hose(s).
    - (6) Stop engine. Disconnect and rewind static ground wire.
    - (7) Store and cover fire extinguishers.
26. Filtered bulk delivery.
- a. Ensure that all valves are closed.
  - b. Connect grounding wire to storage facility and semitrailer.
  - c. Remove 4-inch bulk fuel hose from hose tube and connect it to the receiving facility.

**Performance Steps**

- d. Remove dust cap from outlet B and connect bulk fuel hose to outlet.
- e. Bring fire extinguishers to point of operation.
- f. Start engine and when warm, adjust idle speed to 1,000 to 1,200 RPM.
- g. Remove cap on vapor recovery outlet to allow air to flow back into tank.
- h. Open valves A, B, H, M and K.
- i. Adjust engine throttle for desired flow rate.
- j. At end of operation, decrease engine to idle speed (1,000 to 1,200 RPM).
- k. Close all valves. Remove all hoses and store in hose tubes.
- l. Close hose tube doors. Reinstall dust cover on outlet B.
- m. Shut off engine. Remove grounding wire. Cover and store fire extinguishers.

## 27. Filtered fuel dispensing.

- a. Ensure all valves are closed.
- b. Unreel static reel and connect cable first to grounding stud, then to vehicle.
- c. Bring fire extinguishers to point of operation.
- d. Start engine and when warm, adjust engine speed to 1,000 to 1,200 RPM.
- e. Remove cap on vapor recovery outlet to allow air to flow back into the tank.
- f. Open valves A, H, M, and P or R, depending on which hose reel is to be used. If both hose reels are to be used, open both valves P and R. Reset meter to zero by pushing in meter reset knob and turning clockwise.
- g. Adjust engine throttle for desired flow rate.
- h. Unreel hose(s) completely. Make sure fuel dispensing nozzle is on end of hose(s).
- i. Open safety valve on nozzle. Insert nozzle into vehicle being serviced and squeeze nozzle trigger to start flow.
- j. Release nozzle trigger at end of operation and remove nozzle from vehicle.
- k. Decrease engine to idle speed (1,000 to 1,200 RPM).
- l. Close all valves.
- m. Evacuate hose(s).
  - (1) Ensure all valves are closed.
  - (2) Open valves A, E, G, and K. Open valve P or R (whichever was used) to evacuate the 1 1/4-inch hose.
  - (3) Set engine throttle to maximum speed (2,400 RPM) for a few seconds until evacuation is completed (meter turns backward slowly until fuel is evacuated).
  - (4) Idle down engine. Close all valves.
- n. Rewind hose(s). You can use automatic rewind button and then use handle to rewind last few feet. Do not rewind both hose reels at same time.
- o. Replace vapor recovery outlet cap.
- p. Shut off engine.
- q. Disconnect static reel cables first from vehicle, then from ground. Rewind static reel cable.
- r. Cover and store fire extinguishers.

## 28. Re-circulation operation with 1 1/4-inch hose reel.

- a. Open hose reel cabinet door. Turn release handle and lift door with both hands.

**WARNING**

**Hose reel cabinet is heavy. Use two hands when opening and closing. Use latches to lock door. Do not slam.**

- b. Ensure all valves are closed.
- c. Unreel static reel cable and connect to an approved earth ground.
- d. Bring fire extinguishers to point of operation.
- e. Start engine and when warm, adjust engine speed to 1,000 to 1,200 RPM.
- f. Unreel hose you are going to use. Remove single point nozzle from hose reel coupling.

### Performance Steps

- g. Connect under wing nozzle to hose reel.
  - h. Remove dust cap on re-circulation fitting and connect the hose to the re-circulation fitting on tanker.
  - i. Open valves A, H, M, R or P (depending on which hose reel you use).
  - j. Set engine throttle at desired flow rate.
  - k. Move lever to OPEN position on underwing nozzle and safety valve at end of hose to begin flow.
  - l. At end of operation, adjust to idle speed (1,000 to 1,200 RPM).
  - m. Move lever to CLOSE position on underwing nozzle and safety valve on hose.
  - n. Disconnect underwing nozzle from recirculation fitting. Replace dust cap on recirculation fitting.
  - o. Replace dust cap on underwing nozzle.
  - p. Close all valves.
  - q. Over spill container pull locking pin and twist to disconnect nozzle.
  - r. Evacuate hose.
    - (1) Ensure all valves are closed.
    - (2) Open valves A, E, G, and K. Open valve P or R (whichever was used) to evacuate the 1 1/4- inch hose.
    - (3) Set engine throttle to maximum speed (2,400 RPM) for a few seconds.
    - (4) Open HTARS lever until evacuation is complete (meter turns backward slowly until fuel is evacuated).
    - (5) Idle down engine. Close all valves.
  - s. Rewind 1 1/4-inch hose. Shut off engine.
  - t. Disconnect static reel cable from its ground connection and rewind.
  - u. Close hose reel cabinet door and latch it in place.
  - v. Store and cover fire extinguishers.
29. Load and dispense petroleum products from M967A2 5,000-gallon tanker according to TM 9-2330-356-14.
- a. Bottom loading using self-contained overfill prevention system.
    - (1) Ensure all valves are closed.
    - (2) Ground semitrailer tanker.
    - (3) Hook up vapor recovery system if available. If vapor recovery system is not available, open vapor recovery outlet slowly on opposite side of loading operation. This will let all fumes vent away from operator while loading.
    - (4) Remove cover from bottom loading connection. Connect bottom loading hose to bottom loading connection.
    - (5) Bring fire extinguisher to point of operation.
    - (6) Open valve D and begin flow.

### **WARNING**

**When filling tank by means of bottom loading, a test of the pre-check system is mandatory. If this system is not functioning, stop all operations. Determine problem and have it corrected by a qualified technician. Failure of automatic shutoff to function may result in uncontrolled fuel spillage and danger of fire and explosion.**

- (7) After flow has begun, close valve D to pre-check shutoff float. If float is functional, flow should stop after about 20 to 25 seconds.
- (8) Open valve D. Flow will resume in about 20 seconds.
- (9) When tank is full, flow should stop automatically.
- (10) Close all valves, disconnect hoses, and replace all covers.

**Performance Steps**

- (11) Drain accumulated water.
    - (a) Put container under manifold drain in piping control cabinet. Open emergency valve A.
    - (b) Slowly open valves H and J. Allow fuel to drain until pure fuel begins to flow.
    - (c) Close valves H, J and emergency valve A.
  - (12) Remove grounding wires. Store and cover fire extinguishers.
  - b. Bottom loading using rack monitor overfill prevention system.
    - (1) Ensure all valves are closed.
    - (2) Ground semitrailer tanker.
    - (3) Hook up vapor recovery system if available. If vapor recovery system is not available, open vapor recovery outlet on opposite side of loading operation. This will let the fumes vent away from operator while loading.
    - (4) Remove cover from bottom loading connection. Connect rack's bottom loading to bottom loading connection.
    - (5) Bring fire extinguisher to point of operation.
    - (6) Connect overfill prevention cable at terminal to proper overfill socket on tank.
    - (7) Check Civacon monitor for errors and make sure Green permit light is lit.
    - (8) Open valve D and begin flow.
    - (9) After flow has begun, close valve D to pre-check shutoff float. If float is functional, flow should stop after about 20 to 25 seconds.
    - (10) Open valve D. Flow will resume in about 20 seconds.
    - (11) When tank is filled, close valve D, disconnect the hoses and overfill prevention cable, replace all covers.
    - (12) Drain accumulated water same as prior operation.
    - (13) Remove grounding wires, store, and cover fire extinguishers.
  - 30. Gravity unload using the M967A2.
    - a. Ensure all valves are closed.
    - b. Connect grounding wire to storage facility and grounding stud on semitrailer.
    - c. Remove 4-inch bulk delivery hose (SE) from hose tube.
    - d. Remove dust cover from outlet B and connect hose to outlet B and to storage facility.
    - e. Open vapor recovery outlet cap on vapor recovery line to allow airflow into tank during unloading process.
    - f. Remove fire extinguishers and bring to point of operation.
    - g. Open valves A, H, G, and B to begin flow.
- WARNING**

**Disconnect hose one side at a time to relieve pressure off of hose.**
- h. At end of operation, close all valves. Disconnect hose, replace cap on hose, and put it in hose tube.
  - i. Reinstall dust cover on outlet B.
  - j. Reinstall cap on vapor recovery outlet.
  - k. Drain accumulated water in same manner as with loading procedure.
  - l. Remove grounding wires. Store and cover fire extinguishers.
31. Self load non-filtered fuel servicing involving use of engine and pump.
  - a. Ensure all valves are closed.
  - b. Connect static reel to storage facility. Bring fire extinguishers to point of operation.
  - c. Start engine. When engine is warm, adjust to idle speed (1,000 to 1,200 RPM).
  - d. Remove 4-inch bulk fuel hose from hose tube.
  - e. Remove dust cover from outlet B and connect bulk fuel hose to outlet and storage facility.
  - f. Open vapor recovery outlet.

### Performance Steps

- g. Open valves B, E, D, and G.
  - h. Adjust engine throttle for desired flow rate.
    - i. Shortly after flow has started, close valve D to pre-check shutoff float. If float is functional, flow should stop after 20 to 25 seconds.
    - j. Open valve D. Flow will resume in about 20 seconds.
    - k. When tank is full, flow should stop automatically.
    - l. At end of operation, idle down engine. Close all valves.
  - m. Disconnect 4-inch bulk fuel hose(s) and put them in hose tube. Secure hose tube latches.
  - n. Stop engine.
  - o. Drain accumulated water in same manner as with loading procedures.
  - p. Remove grounding wires. Store and cover fire extinguishers.
32. Bulk delivery from semitrailer to storage facility.
- a. Ensure all valves are closed.
  - b. Connect grounding wire to storage facility and grounding stud on semitrailer. Bring fire extinguishers to point of operation.
  - c. Start engine. When engine is warm, adjust throttle to engine speed (1,000 to 1,200 RPM).
  - d. Remove 4-inch bulk fuel hose from tube.
    - f. Remove vapor recovery outlet cap to allow airflow into the tank.
  - g. Open valves A, B, F, and H.
  - h. Adjust engine throttle for desired flow rate.
    - i. Idle down engine at end of operation.
    - j. Close all valves, disconnect hose(s), and reinstall dust cover.
    - k. Reinstall cap on vapor outlet.
    - l. Replace bulk fuel hose in hose tube and secure latches.
    - l. Remove thermometer after required time and record temperature on gauge worksheet.
  - m. Stop engine.
  - m. Correct volume to 60 degrees F (according to task 101-92F-1409) if required and record and give gauge worksheet to your supervisor.
  - n. Drain accumulated water in same manner as loading procedures.
  - o. Remove grounding wire. Store and cover fire extinguishers.
33. Top loading.
- a. Make sure all valves are closed.

### WARNING

**Top loading should only be done when bottom loading is not possible. When top loading, there is no automatic shutdown system. Man the loading hose to avoid fuel spillage. Use capacity indicator gauge and dipstick gauge to determine the amount of fuel loaded. Failure to follow this warning may result in a fire or explosion hazard.**

- b. Ground semitrailer tanker.
  - (1) Loading with rack or stand. Connect bonding and grounding cable of loading rack or stand to grounding stud on top of tank or one of two on lower side of tank before opening fill cover.
  - (2) Loading with a hose. The loading hose from storage facility may have a metal fitting on free end and hose may not be bonded internally. Before opening fill cover, connect vehicle bonding and grounding cable to grounding stud on top of tank and to some part of permanent piping of loading facility.
- c. Bring fire extinguisher to point of operation.

**Performance Steps**

- d. Slowly open fill cover and insert hose far enough to keep end of hose in contact with bottom of tank.
- e. Remove dust cover from outlet B and connect fuel hose to outlet B and storage facility.
- e. Slowly begin flow and fill tank no further than to bottom of capacity indicator.

NOTE: The capacity indicator gauge is located inside tank near the fill cover. The capacity indicator is a 14-inch long threaded stainless steel rod bolted to the manhole collar. Threaded onto the rod is one 2-inch diameter round disc. The disc can be adjusted on rod to indicate desired liquid capacity level.

- 34. Complete DA Form 3643 and DA Form 2404 or DA Form 5988-E and turn in to supervisor.
- 35. Maintain communications with higher HQ using MTS.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—
5. Performed before-, during-, and after-operations PMCS on system's components according to appropriate TMs. Annotated on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.	—	—
6. Performed safety procedures prior to operations.	—	—
7. Dispatched vehicle using DD Form 1970 or DA Form 5987-E and DA Form 2404 or DA Form 5988-E.	—	—
8. Gauged petroleum tank vehicles.	—	—
9. Operated TPU according to TM 10-4930-236-13&P.	—	—
10. Operated HEMTT according to TM 9-2320-279-10-1.	—	—
11. Performed operator's maintenance and load, unload, and dispense products from M131A5C and M900-series tank vehicles (M967, M969, and M970) and M49A2C tank truck.	—	—
12. Discharged product under pressure using vehicle pump and 4-inch suction hose. Product is not filtered or metered by vehicle.	—	—
13. Performed pressure discharge using the vehicle pump and 4-inch hose (M969 and M970). Product is filtered but not metered by vehicle.	—	—
14. Dispensed non-filtered using vehicle pump and 1 1/4-inch discharge hose (M969).	—	—
15. Dispensed filtered using vehicle pump and 1 1/4-inch discharge hose (M969). Product is metered and filtered by vehicle.	—	—
16. Re-circulated using vehicle pump and 2 1/2-inch discharge hose (M970). Product is metered and filtered by the vehicle.	—	—
17. Re-circulated using vehicle pump and 1 1/2-inch discharge hose (M970). Product is metered and filtered by vehicle.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
18. Dispensed fuel at a single point underwing of aircraft using vehicle pump and 2 1/2-inch discharge hose (M970).	—	—
19. Dispensed fuel closed circuit over wing of an aircraft using vehicle pump and 1 1/2-inch discharge hose (M970).	—	—
20. Defueled using vehicle pump and 1 1/2-inch or 2 1/2-inch discharge hose (M970). Product is metered and filtered by vehicle.	—	—
21. Loaded and dispensed petroleum products from M969A3 5,000 gallon tanker according to TM 9-2330-398-10.	—	—
22. Gravity unloaded M969A3.	—	—
23. Self loaded non-filtered fuel servicing involving use of engine and pump.	—	—
24. Performed hose evacuation (M969A3 only). Purging or removing fuel from dispensing system must be done after every operation that uses dispensing hoses.	—	—
25. Performed non-filtered dispensing.	—	—
26. Performed filtered bulk delivery.	—	—
27. Performed filtered fuel dispensing.	—	—
28. Performed re-circulation operation with 1 1/4-inch hose reel.	—	—
29. Loaded and dispensed petroleum products from M967A2 5,000-gallon tanker according to TM 9-2330-356-14.	—	—
30. Performed gravity unload using M967A2.	—	—
31. Performed self load non-filtered fuel servicing involving use of engine and pump.	—	—
32. Performed bulk delivery from semitrailer to storage facility.	—	—
33. Performed top loading.	—	—
34. Completed DA Form 3643 and DA Form 2404 or DA Form 5988-E and turned in to supervisor.	—	—
35. Maintained communications with higher HQ using MTS.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.



**References**

**Required**

DA FORM 2404  
DA FORM 3643  
DA FORM 5987-E  
DA FORM 5988-E  
DD FORM 1970  
FM 10-67-1  
TB 11-5825-291-10-2  
TM 10-4930-204-13  
TM 10-4930-236-13&P  
TM 11-5825-291-13  
TM 5-4930-237-10  
TM 9-2320-279-10-1  
TM 9-2330-272-14  
TM 9-2330-356-14  
TM 9-2330-398-10

**Related**

DA PAM 750-8  
FM 3-100.12  
FM 3-100.4

## Operate Pumps and Filter Separators

### 101-92F-1415

**Conditions:** Given the requirement to operate and maintain petroleum pumps and filters in a field environment. Personnel and materials required to perform task: all personnel; 50-gallons per million (GPM), 100-GPM, 220-GPM, and 350-GPM pumps and filter separators; a fuel source; fire extinguishers; rags; spill containers; risk management procedures; appropriate Material Safety Data Sheet (MSDS) or Hazardous Material Information Sheet; Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; unit standing operating procedure (SOP); oral or written operations order (OPORD); personal protection equipment (PPE) such as goggles, gloves, and hearing protection; rubber boots; DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); and full access to all reference materials.

**Standards:** Perform operator's preventive maintenance checks and services (PMCS) and dispatch equipment. Emplace and operate given petroleum pumps and filter separators completing all performance measures without injury to personnel or damage to the environment.

#### Performance Steps

### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

NOTE: In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements of performing the task to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation standing operating procedure (SOP)/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.

## Performance Steps

4. Wear appropriate PPE as required.

### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Perform before-operations PMCS on 50-, 100-, 220-, and 350-GPM pumps and filter separators.
- a. Perform before-operations PMCS on 50-GPM pumps according to TM 10-4930-236-13&P using the following procedures:
    - (1) Check discharge nozzle for tight connection and for proper valve operation.
    - (2) Check discharge hoses for leaks or collapsed walls.
    - (3) Check oil level.
    - (4) Check fuel strainer for obstructions and serviceability.
    - (5) Check fuel tank for fuel, insecure mounting, or leaks.
    - (6) Check starting rope for fraying or damage.
    - (7) Check air cleaner.
    - (8) Check suction hose for leaks or collapsed walls.
    - (9) Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be fixed by operator. Notify your supervisor if system is found to be non-mission capable (NMC).
  - b. Perform before-operations PMCS on 50-GPM filter separator according to TM 5-4330-232-12&P.
    - (1) Check differential pressure gauge for secure mounting, loose connections, or damage.
    - (2) Check tube assemblies for kinks, breaks, and loose fittings.
    - (3) Check sight gauge for cracked gauge body. See that mounting screws are tight.
    - (4) Check pressure vent valve by pressing valve to check operation.
    - (5) Check drain valve to ensure that handle is closed.
    - (6) Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by operator. Inform your supervisor if system is found to be NMC.
  - c. Perform before-operations PMCS on 100-GPM pump according to TM 10-4320-310-14 and TM 10-4930-229-12&P.
    - (1) Inspect fuel tank for insecure mounting or defective strap. Replenish fuel supply as required.
    - (2) Check gasoline hose for damage or loose fittings from engine fuel tank to carburetor.
    - (3) Inspect coupling valve for loose or missing gaskets, corroded or stuck valve stem, and cracked or missing parts. Remove and replace defective gaskets.
    - (4) Check pump for leaks.
    - (5) Check and clean fuel inlet strainer as required.
    - (6) Check oil level in gear housing. Add oil as required.
  - d. Perform before-operations PMCS on a 100-GPM filter separator according to TM 5-4330-217-12.
    - (1) Inspect filter separator for dents and evidence of leaks.
    - (2) Inspect cover clamp for secure fit.
    - (3) Inspect cover and O-ring for damage.
    - (4) Inspect frame for dents and cracked welds.
    - (5) Inspect vent valve operation, replace if defective.
    - (6) Inspect drain valve operation and check for evidence of leaks.
    - (7) Inspect dust caps and dust plugs for burns, cracks, breaks, and loose fit.
    - (8) Inspect sight glass for leaks, cracks, or breaks.

**Performance Steps**

- (9) Ensure filter separator is grounded. Grounding rod should be two to three feet in the ground and approximately four feet from the filter separator. Clip grounding wire to grounding rod and to a bare metal area on the filter separator.
- (10) Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by operator. Inform your supervisor if system is found to be NMC.
- e. Perform before-operations PMCS on 220-GPM pump according to TM 10-4320-351-14.
  - (1) Check engine crankcase oil level on dipstick. Oil is at correct level when between upper and lower marks on dipstick.
  - (2) Check condition of air filter element.
  - (3) Inspect ground cable for cuts, breaks, or loose connections.
  - (4) Inspect fuel and oil lines for cuts, breaks, or loose connections.
  - (5) Open vent on filter head assembly. Then open drain valve and drain water until fuel appears.
  - (6) Verify that black start control cable and knobs are down against casing.
  - (7) Check that pulley guard screen and latches are not broken or damaged.
  - (8) Inspect shock mounts for breaks, cuts, or looseness.
  - (9) Check emergency shutoff valve. Remove dust cap, depress continuity ball on valve seat, release, and observe that the ball pops back out. If ball does pop back freely, electrical continuity is lost and static discharge is possible. The coupling must be replaced. Notify unit maintenance.
  - (10) Check electrical cables for tightness and cuts or breaks in cables.
  - (11) Check accessory module ground cable for cuts or breaks or loose connections.
  - (12) Check accessory module battery cable for corrosion.
  - (13) Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by operator. Inform your supervisor if system is found to be NMC.
- f. Perform before-operations PMCS on a 220-GPM filter separator according to TM 10-4330-237-13&P, TM 10-4930-250-13&P, and TM 10-4320-351-14.
  - (1) Insect for physical damage that might prevent successful operation.
  - (2) Check bolts on inlet and outlet coupling. If any bolt or nut is loose, notify supervisor.
  - (3) Check that grounding cable attachment screw and clamp are tightly fastened. If loose, notify unit maintenance.
  - (4) Check liquid fuel filter separator unisex couplings. Remove dust cap, depress continuity ball on valve seat, release, and observe that ball pops out. If ball does not pop back freely, electrical continuity is lost and static discharge is possible. Coupling must be replaced. Notify unit maintenance.
  - (5) Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by operator. Inform your supervisor if system is found to be NMC.
- g. Perform before-operations PMCS on a 350-GPM pump according to TM 5-4320-273-14 and TM 10-4930-239-12&P.
  - (1) Check general condition of the pump to include loose or missing bolts, screws and nuts, loose hose connections, and other loose or damaged fittings or components.
  - (2) Check lubricating system for leaks, check oil level in crankcase, and add oil if below normal.
  - (3) Check fuel system for leaks and add fuel if necessary.
  - (4) Check air cleaner evacuator valve, dust cap, and filter element.
  - (5) Check battery level of electrolyte. If low, fill to proper level with distilled water.
  - (6) Check suction strainer. Remove basket strainer and clean as necessary. Inspect basket for damage.
  - (7) Check gate valves for leaks around stems and for freedom of operation.
  - (8) Check exhaust system, muffler, pipes, and manifold for damage and leaks.
  - (9) Check ground rod assembly. Inspect wire and clamps for damage.
  - (10) Check dust plugs and caps for broken retaining chains and missing parts.
  - (11) Check tires for improper inflation, cuts, blisters, and leaky valve stems.
  - (12) Check control switches for malfunctions.
  - (13) Check wiring harness for frayed or worn spots.

**Performance Steps**

- (14) Check wheels, axle, and frame assembly for broken welds and damage or loose hardware (including lug nuts).
  - (15) Determine if system is NMC if any of the following conditions are found: valve does not turn on or off or leaks; leaks are present in system; battery is too low to crank engine; throttle control is inoperative; or wiring is excessively frayed, worn, or deteriorated.
  - (16) Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by operator. Inform your supervisor if system is found to be NMC.
- h. Perform before-operations PMCS on a 350-GPM filter separator according to TM 5-4330-211-12 and TM 10-4930-239-12&P.
- (1) Make a visual inspection for cracks, breaks, and loose or missing bolts.
  - (2) Inspect to make sure that separator has not been tampered with or damaged.
  - (3) Check sight glass for cracked or broken glass.
  - (4) Make sure that separator is grounded and as level as possible.
  - (5) Check air eliminator to make sure it is tight.
  - (6) Annotate on DA Form 2404 or DA Form 5988-E any deficiencies found that cannot be repaired by operator. Inform your supervisor if system is found to be NMC.
6. Emplace and start pumps according to applicable 10-level TM.
- a. Emplace and start 50-GPM pump according to TM 10-4930-236-13&P.
- (1) Position pump on level ground as close as possible to fuel source (but not less than ten feet).
  - (2) Position fire extinguishers.
  - (3) Connect hoses, nozzles, and filter separator.
    - (a) Place spill containers under each component as connection is made.
    - (b) Connect hard hose from fuel source to intake port on pump.
    - (c) Connect soft hose to discharge ports on pump.
    - (d) Connect filter separator and set it up for operation in accordance with this task.
    - (e) Connect two nozzles to end of each discharge (soft) hose.
  - (4) Ground pump.
    - (a) Drive ground rod into ground close to pump.
    - (b) Attach one end of cable clip to ground rod and other end to an unpainted metal surface on base plate.
  - (5) Prime pump.
  - (6) Ensure proper valves are opened or closed for operation. Start pump by wrapping starting cord around pulley and pulling it.
- b. Emplace and start 100-GPM pump.
- (1) Position pump on level ground as close as possible to fuel source (but not less than ten feet).
  - (2) Position fire extinguishers.
  - (3) Connect hoses, nozzles, and filter separator.
    - (a) Place spill containers under each component as connection is made.
    - (b) Connect hard hose from fuel source to intake port on pump.
    - (c) Connect soft hose to discharge ports on pump.
    - (d) Connect filter separator to system and set it up for operation in accordance with this task.
    - (e) Connect two nozzles to end of each discharge (soft) hose.
  - (4) Ground pump.
    - (a) Drive ground rod into ground close to pump.
    - (b) Attach one end of cable clip to ground rod and other end to an unpainted metal surface on base plate.
  - (5) Start pump.
    - (a) Ensure appropriate valves are open or closed for type of operation.
    - (b) Close choke control lever.
    - (c) Set throttle control lever to idle speed (fully clockwise) position.
    - (d) Set engine ignition switch to ON position.

### Performance Steps

- (e) Wind starter rope around starter flange and pull briskly on handle of rope to start engine.
- (f) After starting engine, set choke control lever to running position when engine has warmed up sufficiently to control running.
- c. Emplace and start 220-GPM pump and filter separator according to critical task 101-92F-1501.
- d. Emplace and start 350-GPM pump.
  - (1) Emplace pump.
    - (a) Locate pump assembly as close as possible to pumping source, but no closer than ten feet. Position it in such a way that hose suction/discharge connections will be easy to make.
    - (b) Be sure site is as level as possible. If the ground is soft, place pump on a foundation of planking, logs, or any other suitable material.
    - (c) Be sure that all sides of pump are easily accessible.
    - (d) Extend trailer support legs as far as possible.
    - (e) Chock wheels once pump is in place.
    - (f) Drive grounding rod approximately three to four feet into ground near pump.
    - (g) Place fuel selector valves in FUEL TANK position.
    - (h) Disconnect and remove coupling half from suction valve.
      - (i) Connect suction hose to suction valve.
      - (j) Disconnect and remove coupling half from discharge valve.
      - (k) Connect discharge hose to discharge valve.
      - (l) Connect suction hose to pumping source.
    - (m) Connect discharge hose to filter separator. Ensure filter separator is ready for operation in accordance with this task.
  - (2) Start pump.
    - (a) Open vent valve and ensure that all suction valves and discharge valves are closed.
    - (b) Check pump fluid level by carefully opening the cam lock levers on priming port cap and raising port cap slightly to see if liquid is discharged from priming port. If liquid is discharged, quickly install priming port cap and place cam lock levers in locked position. If fluid is not discharged, remove port cap and add clean liquid of type to be pumped until liquid level reaches top of priming port.

### WARNING

**Failure to replace priming port cap and lock securely will result in a 2-inch stream of liquid at high pressure, creating a severe fire hazard if fluid is flammable.**

- (c) Install priming port cap and place cam lock levers in locked position.
- (d) Push and raise throttle control from detect latch, releasing it to idle position for manually operated models. For automatic models, place pressure controller manual speed control to IDLE and pressure controller mode selector to START.
- (e) Pull out START/STOP switch.
- (f) Push in START switch and OIL PRESSURE BYPASS switch simultaneously.
- (g) Upon engine start, release START switch.

### CAUTION

Do not hold starter switch for more than ten seconds if engine does not start.

- (h) Release OIL PRESSURE BYPASS switch when 8 psi is exceeded on gauge.

**Performance Steps**

- (i) Allow engine to idle approximately two minutes, then smoothly push throttle control into detect for manual models. For automatic models, place mode selector switch in MANUAL.
- (j) Turn throttle control (for manual models) or manual speed control for (automatic models) to adjust engine speed to approximately 2,400 RPM as indicated on gauge.
- (k) Open suction valve that is connected to suction line.
- (l) Slowly open discharge valve that is connected to discharge line.
- (m) Observe end of vent line for liquid flowing from it. Once liquid begins to flow from line, close vent valve.

**CAUTION**

As pump begins to pump, reduce engine speed and discharge valve opening to prevent hydraulic shock to system when line is filled too fast, causing hose rupture and fitting failure.

NOTE: When pump picks up prime, a change in engine RPM will be noted. Depending on pumping conditions, pump may not take suction immediately. It may be necessary to fill suction line with liquid before pump takes suction. If after a reasonable time pump fails to take suction, shut down engine and check suction line for leaks, then repeat steps (a) through (m).

- (n) Readjust pump speed to desired level. On automatic models, place mode selector on AUTOMATIC.
  - (o) Check all control panel gauges for indications of malfunctions. If a malfunction is indicated, shut down pump immediately.
7. Troubleshoot, perform during-operations PMCS, and dispense product on pumps and filter separators according to applicable 10-level TM.
- a. Troubleshoot, perform during-operations PMCS, and dispense product using 50-GPM pump according to TM 10-4930-236-13&P.
    - (1) Listen for unusual noises.
    - (2) Check for unusual vibration.
    - (3) Observe pump constantly for leaks.
    - (4) Shut down system immediately if any of above conditions exist. Attempt to locate problem and correct it. Clean up and report any spills immediately. Annotate on DA Form 2404 or DA Form 5988-E any uncorrectable system problems. Report any problems to your supervisor.
    - (5) Operate nozzle to dispense product.
  - b. Troubleshoot, perform during-operations PMCS, and dispense product using a 50-GPM filter separator.
    - (1) Check differential pressure gauge, should be in GREEN.
    - (2) Check sight gauge water level drain when ball reaches mark.
  - c. Troubleshoot, perform during-operations PMCS, and dispense product using a 100-GPM pump.
    - (1) Check pump assembly for leaks, cracks, or loose or missing parts.
    - (2) Check for abnormal operation (for example, undue vibration and erratic operation).
    - (3) Check for unusual noises.
    - (4) Check that clutch disengages when engine is set to idle speed.
    - (5) Shut down system immediately if any of the above conditions exist. Attempt to locate problem and correct it. Clean up and report any spills immediately. Annotate on DA Form 2404 or DA Form 5988-E any uncorrectable system problems. Report any problems to your supervisor.
    - (6) Dispense product. Set the throttle control lever to maximum speed. Operate filter separator as outlined in filter separator performance measures below.

**Performance Steps**

- d. Troubleshoot, perform during-operations PMCS, and dispense product using a 100-GPM filter separator.
  - (1) Open vent valve on filter separator and allow the filter separator to fill until product flows out on vent tube.
  - (2) If pressure differential indicator button is in UP position, stop system and change filter elements.
  - (3) Observe system for leaks. Drain water as necessary.
  - (4) Shut down system immediately if any of the above conditions exist. Attempt to locate problem and correct it. Clean up and report any spills immediately. Annotate on DA Form 2404 or DA Form 5988-E any uncorrectable system problems. Report any problems to your supervisor.
- e. Troubleshoot, perform during-operations PMCS, and dispense product using a 220-GPM pump. Inspect for leaks. Operation may continue with class I or class II oil leaks.
- f. Troubleshoot, perform during-operations PMCS, and dispense product using a 220-GPM filter separator.
  - (1) Drain water from sump to avoid freezing.
  - (2) Periodically check for leaks, especially at unisex couplings, vessel end cover, and sight gauge.
- g. Troubleshoot, perform during-operations PMCS, and dispense product using a 350-GPM pump.
  - (1) Troubleshoot 350-GPM pump.
    - (a) Follow these steps if engine fails to crank when starter button is depressed:
      - 1. Check to ensure battery has correct level of electrolyte.
      - 2. Inspect for broken or damaged battery cables and for loose or corroded connections.
    - (b) Troubleshoot engine if it cranks but fails to start.
      - 1. Check ignition switch to see if it is in ON position.
      - 2. Check for insufficiently choked carburetor.
      - 3. Check fuel supply.
      - 4. Check for improper setting on fuel source.
      - 5. Check for water or dirt in fuel bowl.
    - (c) Troubleshoot engine if it starts but then stops.
      - 1. Check for insufficient fuel supply.
      - 2. Check for dirt or water in fuel bowl.
      - 3. Check for pulled out choke.
      - 4. Check for clogged fuel lines.
    - (d) Troubleshoot engine if it runs but continually misfires.
      - 1. Check for water in fuel.
      - 2. Check for clogged fuel strainer.
    - (e) Troubleshoot engine if it overheats.
      - 1. Check oil level.
      - 2. Check that all air shrouding is unclogged, undamaged, and in place.
    - (f) Troubleshoot engine if it runs but lacks power.
      - 1. Ensure throttle is in correct speed position.
      - 2. Check for dirty or incorrect grade of oil.
      - 3. Check that all air shrouding is unclogged, undamaged, and in place.
    - (g) Troubleshoot pump if it fails to prime.
      - 1. Check for insufficient priming liquid in pump.
      - 2. Check for a loose connection on suction side of pump.
  - (2) During operations, observe pump body, fuel lines, and oil lines for leaks. Monitor all controls and instruments for damage, secure mounting, and proper operation.
  - (3) If any of the above problems occur, immediately inform your supervisor. Stop operations and attempt to correct problem. Annotate on DA Form 2404 or DA Form 5988-E any problems requiring a mechanic's attention.
  - (4) Operate appropriate valve and nozzles to dispense product.



**Performance Steps**

h. Troubleshoot, perform during-operations PMCS, and dispense product using a 350-GPM filter separator. Prior to starting system pump, do the following:

- (1) Open valves for operation.
  - (a) Close water drain valve.
  - (b) Open gate valve to inlet side of unit.
  - (c) Open gate valve to outlet side of unit.
  - (d) Turn on system pump as described in this task.
  - (e) Open air eliminator valve on top of unit, if applicable, and close valve when fuel appears.
- (2) Monitor pressure indicator during operation.

NOTE: There are two types of filter separators. One type has a pressure gauge and the other type has a pop up button which indicates too much pressure.

- (3) Perform during-operations PMCS.
  - (a) Check liquid level gauge for presence of water.
  - (b) Check unit for leaks during operation.
  - (c) Check drain valve for proper operation.
- (4) Troubleshoot filter separator.
  - (a) Increase pump speed if flow eliminator shuts off fuel flow.
  - (b) If pressure differential gauge activates or pressure gauge indicates that pressure is too high, take these steps:
    1. Check discharge line for obstructions or kinks.
    2. Check filter elements to see if they require changing.
  - (c) If performance is inadequate, take these steps:
    1. Check to see if canister screen is coated or clogged.
    2. Check for dirty filter elements.
    3. Check pump for proper operation.
    4. Check for a clogged air vent line or valve.
  - (d) Check for a clogged drain line or valve if drainage is inadequate.
- (5) If any of the above problems occur, immediately stop operations and attempt to correct problem. Annotate on DA Form 2404 or DA Form 5988-E any problems requiring a mechanic to fix.

8. Stop pumps and perform after-operations PMCS according to applicable 10-level TM.

- a. Stop 50-GPM pump.
  - (1) Idle pump three to five minutes and push and hold ignition switch in UP position until engine stops.
  - (2) Close fuel shutoff valve.
- b. Perform after-operations PMCS on 50-GPM pump according to TM 10-4930-236-13&P.
  - (1) Recheck all items in before- and during-operations PMCS.
  - (2) Add oil and fuel, as required.
  - (3) Clean assembly.
  - (4) Annotate on DA Form 2404 or DA Form 5988-E any maintenance deficiencies requiring a mechanic's attention. Complete DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)). Forward maintenance forms to your supervisor for review and signature.

9. Perform after-operations PMCS on filter separators.

- a. Perform after-operations PMCS on 100-GPM filter separator.
  - (1) Close gate valves on inlet and outlet sides of filter separator.
  - (2) Check sight gauge for evidence of water. Drain as necessary.
  - (3) If pressure differential indicator is in yellow or red range, change filter elements.
- b. Perform after-operations PMCS on 350-GPM filter separator.
  - (1) Close gate valves on inlet and outlet sides of filter separator.
  - (2) Drain water through water drain valve, if applicable.

**Performance Steps**

- (3) Change filter separator elements if pressure differential gauge pops up or indicates in red or yellow range (depends on type of gauge on the system).
- (4) Make sure dust cap and plug are in place.
- (5) Annotate on DA Form 2404 or DA Form 5988-E any maintenance deficiencies requiring a mechanic's attention. Complete DD Form 1970 or DA Form 5987-E. Forward the maintenance forms to your supervisor for review and signature.
- c. Stop 100-GPM pump.
  - (1) Set throttle control lever to idle speed.
  - (2) Set ignition switch to OFF position.
- d. Perform after-operations PMCS on 100-GPM pump.
  - (1) Check oil and fuel and add as necessary.
  - (2) Recheck all items in before- and during-operations PMCS.
  - (3) Clean assembly.
  - (4) Annotate on DA Form 2404 or DA Form 5988-E any maintenance deficiencies requiring a mechanic's attention. Complete DD Form 1970 or DA Form 5987-E. Forward the maintenance forms to your supervisor for review and signature.
- e. Stop 220-GPM pump and filter separator according to critical task 101-92F-1501.
- f. Stop 350-GPM pump.

**CAUTION**

Do not shut engine down suddenly from full speed unless an emergency exists. Allow engine to stabilize at idle before shutdown.

- (1) On manual models, push and raise throttle control from detect to set engine speed to idle. On automatic models, place PRESSURE CONTROLLER MODE SELECTOR switch to MANUAL. Place the pressure controller manual speed control to IDLE position.
- (2) After approximately two minutes, close discharge valve and suction valve.
- (3) Push in START/STOP switch.
- g. Perform after-operations PMCS on 350-GPM pump.
  - (1) Recheck all items in before- and during-operations PMCS.
  - (2) In addition, check the following:
    - (a) Check fuel and oil levels and add as required. If pump is in continuous operation, check oil levels every ten hours.
    - (b) Remove plug on pump and drain water if ambient temperature is expected to fall below 32 degrees F.
    - (c) Drain fuel filter and water separator if ambient temperature is expected to fall below 32 degrees F.
    - (d) Clean pump.
    - (e) Annotate on DA Form 2404 or DA Form 5988-E any maintenance deficiencies requiring a mechanic's attention. Complete DD Form 1970 or DA Form 5987-E. Forward maintenance forms to your supervisor for review and signature.

**Evaluation Preparation:** See task Conditions and Standards and have MSDS and all safety equipment.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation standing operating procedure (SOP)/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
4. Wore appropriate PPE as required.	—	—
5. Performed before-operations PMCS on 50-, 100-, and 350-GPM pumps and filter separators.	—	—
6. Emplaced and started pumps according to applicable 10-level TM.	—	—
7. Performed troubleshooting and during-operations PMCS on pumps and filter separators according to applicable 10-level TM.	—	—
8. Stopped pumps and performed after-operations PMCS according to applicable 10-level TM.	—	—
9. Performed after-operations PMCS on filter separators.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 2404
- DA FORM 5988-E
- FM 10-67-1
- TM 10-4320-310-14
- TM 10-4320-351-14
- TM 10-4330-237-13&P
- TM 10-4930-229-12&P
- TM 10-4930-236-13&P
- TM 10-4930-250-13&P
- TM 5-4330-217-12

**Related**

- DA PAM 750-8
- FM 3-100.12
- FM 3-100.4

## Perform HEMTT Tanker Aviation Refueling System (HTARS) Operations

101-92F-1417

**Conditions:** Given the requirement to perform fueling operations in a field environment. Personnel and materials required to perform task: five military occupational specialty (MOS)-qualified (92F) Soldiers; risk management procedures; Heavy Extended Mobility Tactical Truck (HEMTT) tanker; HEMTT Tanker Aviation refueling system (HTARS) system; fire extinguishers; spill containers/clean-up materials; personal protective equipment (PPE); appropriate Material Safety Data Sheet (MSDS) or Hazardous Material Information Sheet; radios; Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; unit standing operating procedure (SOP); oral or written operations order (OPORD); DA Form 3643 (Daily Issues of Petroleum Products), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)); and full access to all reference material.

**Standards:** Perform operator's preventive maintenance checks and services (PMCS) and dispatch equipment. Assemble, operate, and perform aviation fuel quality tests prior to servicing aircraft, maintain fuel accountability record, and disassemble the HTARS without damage to equipment or injury to personnel and environment.

### Performance Steps

#### **DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL. AVIATION FUEL IS HIGHLY FLAMMABLE. NO SMOKING OR OPEN FLAMES ARE PERMITTED DURING FUELING OPERATIONS.**

#### **CAUTION**

Before performing this task, read and comply with the appropriate MSDS.

**NOTE:** In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements before performing the task to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor.

Laying out/assembling the HTARS

## Performance Steps

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Wear appropriate PPE as required.

### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Perform before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.
6. Dispatch HEMTT tanker.
  - a. Present your OF Form 346 (US Government Motor Vehicle Operator's Identification Card) or DA Form 5984-E (Operator's Permit Record (EGA)) to motor pool dispatcher to dispatch equipment.
  - b. Obtain equipment record folder from dispatcher once he/she has verified you are qualified to operate equipment.
  - c. Perform before-operations PMCS on the equipment and annotate on DA Form 2404 or DA Form 5988-E appropriately according to TM 5-4930-237-10 and TM 9-2320-279-10-1.
7. Position the vehicle as directed by supervisor.
  - a. Position vehicle for ease of exit from the site.
  - b. Do not block exit routes.
  - c. Position vehicle on level ground.
  - d. Maintain at least 25 feet between tank vehicle during all loading, unloading, and fuel servicing operations.
  - e. Chock wheels and set parking brakes on vehicle.
  - f. Open manhole cover during all loading, unloading, and fuel servicing operations.
  - g. Post NO SMOKING signs and position fire extinguishers within easy reach.
  - h. Ground and bond vehicle. Drive a grounding rod into ground to level of permanent moisture. Under arid conditions, keep ground moist around grounding rod. If soil is not conductive, keep ground moist with a 50/50 water and salt mixture. Epsom salts, copper sulfate, calcium chloride, and potassium nitrate may also be used. Ground and bond the vehicle.
  - i. Connect one static cable to grounding rod to ground system.

NOTE: Grounding plug on HTARS is used to bond system to aircraft being refueled.

8. Assemble system.

NOTE: System can be configured to meet varying mission and site requirements.

- a. Layout system. Do not throw or drag hoses on ground. Do not walk on hoses. Failure to comply can result in damage to hose and end connectors.
- b. Assemble the appropriate components of system as directed by the supervisor.

NOTE: When laying out equipment, never remove a dust cap until ready to make a connection. This will prevent dust or particulate matter from entering system and causing fuel contamination.

### Performance Steps

- (1) Connect a 3-inch discharge hose as follows:

NOTE: Unisex fittings will not connect if the FLOW handles are in flow position.

- (a) Remove carrying strap from a 3-inch discharge hose.
  - (b) Roll the 3-inch discharge hose out flat and straight on ground behind truck.
  - (c) Pull cam arms away from body.
  - (d) Connect cam lock coupling end to V-11 valve on tanker.
  - (e) Push cam arms against body.
- (2) Connect T connectors, 2-inch discharge hose, and elbow connectors as follows:
    - (a) Remove dust caps from center of one T connector.
    - (b) Connect T connector to 3-inch discharge hose.
    - (c) Remove carrying straps from two 2-inch discharge hoses.
    - (d) Roll both 2-inch discharge hoses out flat and straight on ground near T connector.
    - (e) Remove dust caps from T connector and both 2-inch discharge hoses.
    - (f) Connect both 2-inch discharge hoses to T connector.
    - (g) Remove dust caps from two T connectors.
    - (h) Connect one T connector to each 2-inch discharge hose.
    - (i) Remove carrying straps from four 2-inch discharge hoses.
    - (j) Roll 2-inch discharge hoses out flat and straight on ground near T connectors.
    - (k) Remove dust caps from T connectors and 2-inch discharge hoses.
    - (l) Connect both 2-inch discharge hoses to T connectors.
    - (m) Connect 2-inch discharge hoses together.
    - (n) Remove one dust cap from each elbow connector.
    - (o) Connect one elbow connector to each 2-inch discharge hose.
    - (p) Remove carrying straps from four 2-inch discharge hoses.
    - (q) Roll a 2-inch discharge hose out on the ground near T and elbow connectors.
    - (r) Remove dust caps from the T and elbow connectors.
    - (s) Remove dust caps from the 2-inch discharge hoses.
    - (t) Connect a 2-inch discharge hose to each T or elbow connector.
  - (3) Put FLOW handles in flow position.
  - (4) Connect CCR nozzle as follows:
    - (a) Remove dust cap from coupling on CCR nozzle.
    - (b) Connect CCR nozzle to coupling.
    - (c) As required, repeat steps (1) and (2) for each CCR nozzle.
  - (5) Connect over wing nozzle.
    - (a) Remove dust cap from over wing nozzle.
    - (b) Remove outlet cap from CCR nozzle.
    - (c) Insert inlet end of over wing nozzle in outlet end of CCR nozzle.
    - (d) As required, repeat steps (1), (2), and (3) for each over wing nozzle.
  - (6) Connect recirculation nozzle.
    - (a) Remove dust cap from recirculation nozzle.
    - (b) Remove outlet cap from CCR nozzle.
    - (c) Insert inlet end of recirculation nozzle.
    - (d) As required, repeat steps (1) (2), and (3) for each recirculation nozzle.
  - (7) Connect D1 nozzle.
    - (a) Twist dust cap to left and remove dust cap from D1 nozzle.
    - (b) Connect coupling on D1 nozzle.

c. Position fire extinguishers according to refueling points.

d. Camouflage truck and system.

### Operating system

9. Recirculate fuel prior to servicing aircraft.
  - a. Connect recirculation nozzle to end of last refueling point.
  - b. Bring hose back from last refueling point to HEMMT tanker.
  - c. Remove dust cover from A B/L RECEPTACLE.
  - d. Remove dust cover from recirculation nozzle.

**Performance Steps**

- e. Connect recirculation nozzle to A B/L RECEPTACLE.
- f. Open V-11 valve on HEMMT tanker.
- g. Push in V6 FUEL/DEFUEL valve control rod.
- h. Pull back MC MANUAL CONTROL EM VALVE lever.
- i. Push PUMP ENGAGEMENT LEVER forward.
- j. Set TC/THROTTLE CONTROL switch up to ON position.
- k. Press HI/HIGH IDLE switch.
- l. Pull out HAV HAND-ACTUATED CONTROL valve.
- m. Move recirculation adapter valve lever to OPEN position.

NOTE: The HAV HAND ACTUTED CONTROL valve must be open for fuel to flow.

- n. Squeeze and hold HAV HAND ACTUATED CONTROL valve lever to recirculate fuel.
- o. When recirculation is complete, release HAV HAND ACTUATED CONTROL valve lever.
- p. Move recirculation adapter valve lever to CLOSE position.
- q. Close V-11 valve on HEMMT tanker.
- r. Set TC/THROTTLE CONTROL switch down to OFF position.
- s. Disconnect recirculation adapter from A B/L RECEPTACLE.
- t. Replace dust cap on A B/L RECEPTACLE.
- u. Replace dust cap on recirculation adapter.
- v. Pull back on PUMP ENGAGEMENT LEVER until locked.
- w. Push MC MANUAL CONTROL EM VALVE lever forward.
- x. Return hose to refueling point.
- y. Remove and store recirculation adapter.
- z. Repeat steps for other side.

10. Perform Millapore and Aqua-Glo tests according to TM 5-6630-218-10.

11. Operate system as directed by supervisor.

- a. Place HEMTT fuel pumps into operation according to task 101-92F-1414.
- b. Guide aircraft into position using proper hand and arm signals in FM 10-67-1(Chapter 2).
- c. Check with pilots to be sure all armaments are on SAFE.
- d. Deplane crew and passengers.

NOTE: Passengers must go to designated marshalling area. Members of the crew, except pilot or copilot who may remain at controls if necessary, should deplane and assist with refueling or man fire extinguisher.

- e. Carry fire extinguisher out to aircraft and place it within reach of aircraft fill port.
- f. Put spill container in place.
- g. Ensure pilot notifies his/her commander that he/she will be off the air during refueling.
- h. Connect HTARS ground plug to aircraft.

<p><b>WARNING</b></p> <p><b>The ground plug must be connected before attaching nozzle to aircraft. Failure to comply can result to injury or death to personnel from static discharge.</b></p>
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- i. Open and wipe around aircraft fill port with a clean cloth to remove dust or dirt.
- j. Remove dust cap from nozzle
- k. Connect nozzle being used as follows:
  - (1) Grasp handle grips and align inlet with fuel receptacle.
  - (2) Press nozzle against fuel receptacle and turn to align pins.
  - (3) Turn nozzle clockwise until it stops.
- l. Put the FLOW handle in flow position.

## Performance Steps

### WARNING

**Do not leave nozzle at any time during refueling. Stop flow of fuel if there is any emergency at refueling point.**

- m. When tank is full, close flow handle.
  - n. Turn nozzle counterclockwise to remove it from aircraft receptacle and install dust cap. Place nozzle in the container.
  - o. Install fuel cap on aircraft receptacle.
  - p. Wipe exterior of recirculation nozzle and aircraft receptacle with a clean cloth to remove dust or fuel.
  - q. Unplug nozzle bonding plug or release bonding clip. Carry nozzle back to hanger. Do not lay it or drag it across the ground.
  - r. Release grounding cable clip from aircraft.
  - s. Take fire extinguisher back to a position near nozzle hanger.
  - t. Record issue on DA Form 3643 according to DA Pamphlet 710-2-1.
  - u. Have aircrew and passengers reboard aircraft. Turn off pump on HEMTT tanker if no other aircraft is being refueled.
  - v. After receiving clearance guide aircraft to lift off.
  - w. Once aircraft has departed area, immediately clean up any spills and report them to supervisor. Dispose of waste fuel and fuel contaminated materials in an environmentally safe manner according to local policies and procedures.
12. Shut down system. Shut down HEMTT according to task 101-92F-1414.
- a. Drain/disassemble/store system.

### CAUTION

Do not throw or drag hoses on ground. Do not walk on hoses or flatten it to drain fuel. FLOW handles must be closed to disconnect components.

- (1) Operate HEMTT tanker to evacuate fuel from hoses.
  - (a) Open FLOW handles.
  - (b) Pull down fuel/defuel valve on HEMTT.
  - (c) Engage PTO on HEMTT.
  - (d) Squeeze HAV VALVE on HEMTT.
  - (e) Engage HI idle and throttle control on HEMTT until hoses are drained.
  - (f) Disengage HI idle and throttle control on HEMTT.
  - (g) Release HAV VALVE on HEMTT.
  - (h) Disengage PTO on HEMTT.
  - (i) Push in fuel/defuel valve on HEMTT.
  - (j) Close FLOW handles.
- (2) Disconnect 2-inch discharge hose and elbow connector as follows:
  - (a) Close FLOW handles.
  - (b) Pull interlock pin.
  - (c) Disconnect 2-inch discharge hose from elbow connector.
  - (d) Install dust cap on 2-inch discharge hose.
  - (e) Install dust cap on elbow connector.
  - (f) Pull interlock pin and disconnect elbow connector from 2-inch discharge hose.
  - (g) Install dust cap on elbow connector.



**Performance Steps**

- (h) Repeat steps (1) through (7) for the other 2-inch discharge hoses and elbow connector.
  - (3) Disconnect 2-inch discharge hoses and T connectors as follows:
    - (a) Close FLOW handles.
    - (b) Disconnect 2-inch discharge hose from T connector.
    - (c) Install dust cap on 2-inch discharge hose.
    - (d) Install dust cap on T connector.
    - (e) Repeat steps (1) through (4) for other 2-inch discharge hoses and T connectors.
  - (4) Disconnect T connector and 3-inch discharge hose as follows:
    - (a) Close FLOW handles.
    - (b) Disconnect T connector from 3-inch discharge hose.
    - (c) Install dust cap on 3-inch discharge hose.
    - (d) Install dust cap on T connector.
  - (5) Disconnect 3-inch discharge hose as follows:
    - (a) Pull cam arms away from body.
    - (b) Slide end off cam lock coupling on tanker.
    - (c) Push cam arms against body.
  - (6) Roll discharge hoses into a tight coil and secure them with carrying strap.
  - (7) Wipe equipment with a clean cloth to remove dirt, dust, moisture, and fuel.
  - (8) Store equipment in storage box on tanker.
13. Disassemble and store system's components.
  14. Disassemble and store camouflage equipment.
  15. Complete DA Form 3643 and DA Form 2404 or DA Form 5988-E and turn in to supervisor.

**Evaluation Preparation:** See task Conditions and Standards.

**Performance Measures**

Laying out/assembling the HTARS

	<u>GO</u>	<u>NO-GO</u>
1. Applied risk management procedures.	___	___
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	___	___
3. Read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	___	___
4. Wore appropriate PPE as required.	___	___
5. Performed before-, during-, and after-operations PMCS on system's components according to TM 5-4930-237-10 and TM 9-2320-279-10-1. Annotated on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.	___	___
6. Dispatched HEMTT tanker.	___	___
7. Positioned vehicle.	___	___
8. Assembled system.	___	___
9. Recirculated fuel prior to servicing aircraft.	___	___
10. Performed Millapore and Aqua-Glo tests according to TM 5-6630-218-10.	___	___
11. Operated system as directed by supervisor.	___	___
12. Shut down system as directed by supervisor.	___	___

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
13. Disassembled and stored system's components.	—	—
14. Disassembled and stored camouflage equipment.	—	—
15. Completed DA Form 3643 and DA Form 2404 or DA Form 5988-E and turned in to supervisor.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 2404
- DA FORM 3643
- DA FORM 5984-E
- DA FORM 5987-E
- DA FORM 5988-E
- DD FORM 1970
- FM 10-67-1
- FM 3-04.111
- OF FORM 346
- TM 5-4930-237-10
- TM 5-6630-218-10
- TM 9-2320-279-10-1

**Related**

- DA PAM 710-2-1
- FM 3-100.12
- FM 3-100.4

## Subject Area 3: CLASS III OPERATIONS

**Operate Fuel System Supply Point (FSSP)****101-92F-1153**

**Conditions:** Given the requirement to store and issue bulk petroleum at a Class III supply point in a field environment. Personnel and materials required to perform task: seven military occupational specialty (MOS)-qualified (92F) Soldiers; risk management procedures; applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE); a complete FSSP; 5-ton cargo trailer; prefabricated supports; 5,000-gallon tank semitrailer; spill kit/containers; fire extinguishers; extra hose and fittings for berm drains; layout plans; a rough-terrain forklift with operator; equipment for fire wall construction; Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; Oil Discharge Contingency Plan (ODCP) (if required); DA Form 3643 (Daily Issues of Petroleum Products); DA Form 2765-1 (Request for Issue or Turn-in), DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); and full access to all reference material.

**Standards:** Perform operator's preventive maintenance checks and services (PMCS) and dispatch equipment. Off-load, assemble, operate, maintain fuel accountability record, perform fuel quality surveillance, and disassemble the FSSP without injury to personnel, damage to equipment, or pollution of the environment.

**Performance Steps****DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements before performing the task to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.

## Performance Steps

4. Wear appropriate PPE as required.

### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Dispatch vehicles and equipment using DD Form 1970 or DA Form 5987-E.
6. Perform before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.
7. Unload FSSP equipment.
8. Place FSSP equipment on site according to layout plan. Lay out equipment in this order:
  - a. Collapsible tanks.
    - (1) Maintain at least 40 feet between the 10,000 gallon tanks and 150 feet between larger tanks.
    - (2) Avoid stepping on bags as you unfold them.
    - (3) Inspect bags, tank filler, and vent assemblies for serviceability as you lay out tanks.
  - b. Pumps and filter separators.
    - (1) Place 350-gallons per minute (GPM) pump in position.
    - (2) Lower retractable support and chock wheels on pumps.
    - (3) Place 350-GPM filter separator in position.
    - (4) Put shims under skids to help level them.
    - (5) Ground each pump and filter separator when placed.
    - (6) Connect hose or pipe to automatic water drain port on filter separators.
  - c. Fitting assemblies/hoses.
    - (1) Ensure suction hoses are on the receiving side of system and discharge hoses are on the dispensing side.
    - (2) Place a 3 -inch discharge hose at tank truck bottom loading points.
    - (3) Place a 1 1/2-inch discharge hose at 500-gallon collapsible drum filling points.
    - (4) Place a 1-inch discharge hose at vehicle refueling points.
    - (5) Keep all dust plugs and caps on hoses and fittings until they are connected.
  - d. Fuel- and oil-servicing nozzles.
    - (1) Attach nozzles to 1-inch discharge nozzles. Make sure each nozzle has a dust cover.
    - (2) Place supports under nozzles to prevent them from lying on ground.
9. Assemble FSSP equipment.
  - a. Position and connect components as follows:

NOTE: Steps may change according to terrain and mission requirements.

- (1) Position tank liners inside berms. Inspect it for cuts, tears, and snags as it is laid out.
- (2) Position collapsible tanks in berms. Inspect each tank for cuts, tears, and snags as it is laid out.
- (3) Position and connect drain fitting assemblies on each of the tanks.
- (4) Position and connect filler/discharge assembly on top of each tank.
- (5) Position two tank reference poles, one on each side of each of the tanks. Attach a rope to each set of poles ensuring ropes are 4 feet high in middle of tank.
- (6) Place two suction hoses at each tank in a straight line from filler/discharge ports to outside of berms.
- (7) Place double Tee valve assemblies at end of each set of suction hoses.
- (8) Place a suction hose (the "crossover" hose) at double Tee receiving port.
- (9) Place six suction hoses between double Tee valve assemblies at tank one and tank two.

**Performance Steps**

- (10) Repeat steps (1) through (9) for tanks two through six.
- (11) Place a single Tee valve assembly at end of each crossover hose.
- (12) Place six suction hoses in a straight line between single Tee valve assemblies at tank one and tank two.
- (13) Repeat steps (11) and (12) for tanks two through six.
- (14) Connect suction hoses to each tank's filler/discharge ports.
- (15) Connect two suction hoses together, extending from each tank's filler/discharge port.
- (16) Connect tank's double Tee valve assembly to end of suction hoses and connect crossover hoses to double Tee receiving ports.
- (17) Connect single Tee valve assemblies to ends of crossover hoses.
- (18) Connect six suction hoses between double Tee valve assembly of tanks one and two.
- (19) Repeat steps (14) through (16) for tanks two through six.
- (20) Connect six suction hoses between single Tee valve assembly of tanks one and two.
- (21) Repeat step (20) for tanks two through six.
- (22) Place two suction hoses in a straight line from single Tee valve assembly toward receiving point.
- (23) Place filter separator at end of the two suction hoses.
- (24) Place one suction hose at inlet side of filter separator.
- (25) Place 350-GPM pump at end of suction hose.
- (26) Place two suction hoses in a straight line from pump toward receiving end.
- (27) Place a Y assembly at end of two suction hoses.
- (28) Place three suction hoses on the right side and three suction hoses on the left side of the Y assembly.
- (29) Place a quick acting valve at end of suction hose on the right side and a quick acting valve at end of suction hose on left side.
- (30) Connect one end of two suction hoses to single Tee valve assembly.
- (31) Connect two suction hoses together and connect other end to filter separator outlet port.
- (32) Connect one suction hose to filter separator inlet port and other end to pump outlet.
- (33) Connect one of two suction hoses to pump inlet.
- (34) Connect two suction hoses together and connect other end to Y assembly.
- (35) Connect one of three suction hoses on right side and left side of the Y assembly to Y.
- (36) Connect three suction hoses together on right side and left side of Y assembly and connect gate valve to end hose.
- (37) Place three suction hoses at end of double Tee valve assembly extending from tank three.
- (38) Place three suction hoses at end of double Tee valve assembly extending from tank six.
- (39) Place two suction hoses at end of single Tee valve assembly extending from tank three.
- (40) Place two suction hoses at end of single Tee valve assembly extending from tank six.
- (41) Place one single Tee valve assembly between four suction hoses.
- (42) Place two suction hoses at end of single Tee valve assembly.
- (43) Place one 350-GPM pump at end of two suction hoses.
- (44) Place one discharge hose at pump outlet.
- (45) Place one 350-GPM filter separator at end of discharge hose.
- (46) Place one 25-foot discharge hose at end of filter separator.
- (47) Place a Y assembly at end of discharge hose.
- (48) Place three discharge hoses on right side and left side of the Y assembly.
- (49) Place a gate valve at each end of suction hoses.
- (50) Connect one suction hose to double Tee valve assembly extending from tank three.
- (51) Connect three suction hoses.
- (52) Connect one suction hose to double Tee valve assembly extending from tank six.
- (53) Connect three suction hoses.
- (54) Connect one suction hose to single Tee valve assembly extending from tank three.
- (55) Connect two suction hoses.
- (56) Connect single Tee valve assembly to each hose.
- (57) Connect two hoses extending from single Tee valve assembly together.

**Performance Steps**

- (58) Connect one end of suction hose extending from double Tee valve assembly of tank three to left pump inlet.
  - (59) Connect one end of suction hose extending from double Tee valve assembly of tank six to right pump inlet.
  - (60) Connect one end of suction hose extending from single Tee valve assembly to right pump outlet.
  - (61) Connect one end of discharge hose to left pump outlet and other end to filter separator inlet port.
  - (62) Connect one end of 25-foot discharge hose to filter separator outlet port and other end to Y assembly.
  - (63) Connect one of three discharge hoses on right side and left side of the Y assembly to Y.
  - (64) Connect three discharge hoses together on right side and left side of Y assembly and connect gate valve to end hose.
  - (65) Disconnect and cap two suction hoses.
  - (66) Disconnect and cap remaining suction hoses from double Tee valve assembly.
  - (67) Place a spill container under double Tee valve assembly extending from tank two.
  - (68) Disconnect suction hose leading to receiving point and hold open end of hose in spill container.
  - (69) Lift other end of suction hoses at least shoulder high and uncap hoses.
  - (70) Walk fuel in hose back towards double Tee valve assembly and when reaching spill container, go back to beginning of hose and walk fuel through again.
  - (71) Cap each end of suction hose.
  - (72) Disconnect and cap six suction hoses.
  - (73) Disconnect suction hose leading to tank two and hold open end of hose in spill container.
- b. Recheck all connections to make sure they are tight. Ensure drip pans are in place under nozzles and other connections that are likely to leak.

10. Inform supervisor when system is ready to operate.

Performing operations

11. Operate FSSP to receive and issue product.

**WARNING**

**Death or serious injury can occur from exploding fuel ignited by static electric discharge. Before operating the FSSP, be sure that all components are properly grounded.**

**Performance Steps****WARNING**

**DEATH or SEVERE INJURY can occur from fire and explosion of fuels. To avoid fire and explosion during operation of the FSSP. DO NOT allow any flame producing material within 100 feet of the FSSP.**  
**DO NOT smoke or allow smoking during refueling operations.**  
**DO NOT allow fuel to drip onto hot surfaces.**  
**DO NOT refuel equipment while its engine is running.**

**WARNING**

**Spilled fuel can ignite or explode and cause serious injury or death to personnel. All valves are to remain in the closed position unless one of the following steps specifically instructs you to open a particular valve.**

NOTE: Be sure that fire extinguishing equipment is available and operational.

- a. Store fuel in FSSP.
  - (1) Attach gate valve on receiving side of manifold to outlet of fuel transporter or pipeline and open gate valves.
  - (2) Open gate valves in hose line between fuel transporters or pipeline and fuel storage tank.
  - (3) Start receiving pump.
  - (4) When all fuel is transferred from transporter or tanks are full, shut down pump and close FSSP.
  - (5) Record receipt on DA Form 3643 according to DA Pamphlet 710-2-1.
- b. Dispense fuel from FSSP.

NOTE: Fuel is normally drawn from one tank at a time while valves leading to other tanks in the system are closed to minimize friction loss and reduction in pumping capacity.

- (1) Open gate valves leading from dispensing tank to dispensing pump. Ensure that all quick acting valves leading from pump to dispensing nozzles are closed before operating pump.
  - (2) Operate pump.
  - (3) Open quick acting valves leading from pump and filter separator to dispensing nozzles.
  - (4) Dispense product.
  - (5) When operation is complete, close all valves and shut down pump.
  - (6) Record issue on DA Form 3643 or DA Form 2765-1, according to DA Pamphlet 710-2-1.
  - (7) Report any maintenance shortcomings found during operation of system on DA Form 2404 or equivalent.
  - (8) Check site for any spills and clean them up.
  - (9) Perform after-operations PMCS on FSSP equipment.
12. Evacuate product from FSSP into 5,000-gallon tank semitrailer.
  13. Disassemble and place FSSP equipment into containers as appropriate.
    - a. Disassemble system as follows:
      - (1) Place a spill container under pump inlet.
      - (2) Disconnect suction hose from pump inlet and cap hose.
      - (3) Place a spill container under Y assembly.

### Performance Steps

- (4) Disconnect right suction hose from Y assembly and cap Y.
- (5) Hold open end of hose in spill container.
- (6) Lift other end of suction hose at least shoulder high and open gate valve.
- (7) Walk fuel hose back toward Y and when reaching spill container, go back to beginning of hose and walk fuel through again.
- (8) Disconnect gate valve from suction hose and cap hose.
- (9) Cap end of suction hose in spill container.
- (10) Disconnect and cap three suction hoses.
- (11) Disconnect middle suction hose from Y assembly and cap Y.
- (12) Hold open end of hose in spill container.
- (13) Lift other end of hose at least shoulder high and uncap it.
- (14) Hold fuel in hose back toward Y and when reaching spill container, go back to beginning of hose and walk fuel through again.
- (15) Place spill container under pump outlet.
- (16) Disconnect suction hose from pump outlet and cap hose.
- (17) Place spill container under filter separator inlet port.
- (18) Disconnect suction hose from filter separator inlet port and cap inlet port.
- (19) Hold open end of hose in spill container.
- (20) Lift other end of hose at least shoulder high and uncap hose, letting it drain in spill container.
- (21) Cap each end of the suction hose.
- (22) Place spill container under single Tee valve assembly.
- (23) Disconnect suction hose from single Tee valve assembly and cap hose.
- (24) Place a spill container under filter separator outlet port.
- (25) Disconnect suction hose from outlet port and hold open end of hose in spill container.
- (26) Lift other end of hose at least shoulder high and uncap hose.
- (27) Walk fuel in hose back toward filter separator. When reaching spill container, go back to beginning of hose and walk fuel through again.
- (28) Cap end of suction hose in spill container.
- (29) Cap other end of hose.
- (30) Disconnect and cap two suction hoses.
- (31) Gather up all hoses and fittings and stack them neatly between pump and filter separator.
- (32) Place a spill container under single Tee valve assembly extending from tank one.
- (33) Disconnect both hoses from single Tee valve assembly and cap them.
- (34) Place a spill container under double Tee valve assembly extending from tank one.
- (35) Disconnect crossover hose from double Tee valve assembly and hold open end of hose in spill container.
- (36) Lift other end of crossover hose at least shoulder high, uncap hose, and let fuel drain in spill container.
- (37) Cap each end of the crossover hose.
- (38) Place a spill container under single Tee valve assembly extending from tank two.
- (39) Disconnect suction hose leading to receiving point and hold open end of hose in spill container.
- (40) Lift other end of suction hose at least shoulder high and uncap hose.
- (41) Walk fuel in hose back toward single Tee valve assembly. When reaching spill container, go back to beginning of hose and walk fuel through again.
- (42) Cap each end of the suction hose.
- (43) Disconnect and cap six suction hoses.
- (44) Disconnect two remaining hoses from single Tee valve and cap them.
- (45) Place a spill container under double Tee valve assembly extending from tank two.
- (46) Disconnect crossover hose from double Tee valve assembly and hold open end of hose in spill container.
- (47) Lift other end of crossover hose at least shoulder high, uncap hose, and let fuel drain in spill container.
- (48) Cap each end of the crossover hose.



**Performance Steps**

- (49) Place a spill container under single Tee valve assembly extending from tank three.
- (50) Disconnect suction leading to receiving point and hold open end of hose in spill container.
- (51) Lift other end of suction hose at least shoulder high and uncap hose.
- (52) Walk fuel in hose back toward single Tee valve assembly. When reaching spill container, go back to beginning of hose and walk fuel through again.
- (53) Cap each end of the suction hose.
- (54) Disconnect and cap six suction hoses.
- (55) Disconnect two remaining hoses from single Tee valve assembly and cap them.
- (56) Place a spill container under double Tee valve assembly
- (57) Disconnect crossover hose from double Tee valve assembly and hold open end of hose in spill container.
- (58) Lift other end of crossover hose at least shoulder high, uncap hose, and let fuel drain in spill container.
- (59) Lift other end of crossover hose at least shoulder high, uncap hose, and let fuel drain in spill container.
- (60) Cap each end of the crossover hose.
- (61) Place a spill container under double Tee assembly extending from tank one.
- (62) Disconnect suction hose leading to tank one and hold open end of hose in spill container.
- (63) Disconnect other end from filler/discharge assembly and hold hose in air at least shoulder high.
- (64) Walk fuel in hose back toward double Tee valve assembly. When reaching spill container, go back to beginning of hose and walk fuel through again.
- (65) Cap each end of the suction hose.
- (66) Disconnect and cap two suction hoses.
- (67) Disconnect and cap remaining suction hose from double Tee valve assembly.
- (68) Place a spill container under double Tee valve assembly extending from tank two.
- (69) Disconnect suction hose leading to receiving point and hold open end of hose in spill container.
- (70) Lift other end of suction hose at least shoulder high and uncap hoses.
- (71) Walk fuel in hose back toward double Tee valve assembly. When reaching spill container, go back to beginning of hose and walk fuel through again.
- (72) Cap each end of the suction hose.
- (73) Disconnect and cap other six suction hoses.
- (74) Disconnect suction hose leading to tank two and hold open end of hose in spill container.
- (75) Disconnect other end from filler/discharge assembly and hold hose in air at least shoulder high.
- (76) Walk fuel hose back toward double Tee valve assembly. When reaching spill container, go back to beginning of hose and walk fuel through again.
- (77) Cap each end of the suction hose.
- (78) Disconnect and cap two suction hoses.
- (79) Disconnect and cap remaining suction hose from double Tee valve assembly.
- (80) Place a spill container under double Tee valve assembly extending from tank three.
- (81) Disconnect suction hose leading to receiving point and hold open end of hose in spill container.
- (82) Lift other end of suction hose at least shoulder high and uncap hoses.
- (83) Walk fuel in hose back toward double Tee valve assembly. When reaching spill container, go back to beginning of hose and walk fuel through again.
- (84) Cap each end of the suction hose.
- (85) Disconnect and cap six suction hoses.
- (86) Disconnect suction hose leading to tank two and hold open end of hose in spill container.
- (87) Disconnect other end from filler/discharge assembly and hold hose in air at least shoulder high.
- (88) Walk fuel in hose back toward double Tee valve assembly. When reaching spill container, go back to beginning of hose and walk fuel through again.
- (89) Cap each end of the suction hose.

**Performance Steps**

- (90) Disconnect and cap two suction hoses.
- (91) Place a spill container under double Tee valve assembly extending from tank three.
- (92) Disconnect suction hose leading to receiving point and hold open end of hose in spill container.
- (93) Disconnect other end from filler/discharge assembly and hold hose in air at least shoulder high.
- (94) Walk fuel in hose back toward double Tee valve assembly. When reaching spill container, go back to beginning of hose and walk fuel through again.
- (95) Cap each end of the suction hose.
- (96) Disconnect and cap two suction hoses.
- (97) Disconnect and cap remaining suction hose from double Tee valve assembly.
- (98) Gather all hoses and fittings and place them in their containers.
- (99) Disconnect drain fitting assembly from bottom of tank one.
- (100) Disconnect filler/discharge assembly from top of tank one.
- (101) Disconnect vent filling assembly from top of tank one.
- (102) Fold tank one and place it in its container.
- (103) Fold tank liner and place it in its container.
- (104) Place a spill container under single Tee valve assembly between berms three and six.
- (105) Disconnect suction hoses leading to berm three and hold open end of hose in a spill container.
- (106) Lift other end of suction hose at least shoulder high and uncap hose.
- (107) Walk fuel in hose back toward single Tee valve assembly. When reaching spill container, go back to beginning of hose and walk fuel through again.
- (108) Cap each end of the suction hose.
- (109) Disconnect and cap two suction hoses.
- (110) Disconnect suction hose leading to pump outlet and hold open end of hose in spill container.
- (111) Place a spill container under pump outlet, disconnect suction hose, and hold suction hose at least shoulder high.
- (112) Walk fuel in hose back toward single Tee valve assembly. When reaching spill container, go back to beginning of hose and walk fuel through again.
- (113) Cap each end of the hose.
- (114) Disconnect and cap two suction hoses.
- (115) Place a spill container under pump inlet.
- (116) Disconnect suction hose leading toward berm three and hold open end of hose in spill container.
- (117) Lift other end of suction hose at least shoulder high and uncap hose.
- (118) Walk fuel in hose back toward pump. When reaching spill container, go back to beginning of hose and walk fuel through again.
- (119) Cap each end of the suction hose.
- (120) Disconnect and cap three suction hoses.
- (121) Gather up disconnected hoses and fittings and place them neatly by pump.
- (122) Place a spill container under pump outlet.
- (123) Disconnect and cap discharge hose extending from pump outlet.
- (124) Place a spill container under filter separator inlet port.
- (125) Disconnect discharge hose from inlet port and hold open end of hose in spill container.
- (126) Lift other end of discharge hose at least shoulder high, uncap hose, and let fuel drain into spill container.
- (127) Cap each end of the hose.
- (128) Place a spill container under filter separator outlet port.
- (129) Disconnect discharge hose from outlet port and cap it.
- (130) Place a spill container under Y assembly.
- (131) Disconnect discharge hose from Y, cap Y, and hold open end of hose in spill container.
- (132) Lift other end of discharge hose at least shoulder high and uncap hose.

**Performance Steps**

- (133) Walk fuel in hose back toward Y. When reaching spill container, go back to beginning of hose and walk fuel through again.
  - (134) Cap male end of discharge hose and use it as a reel for rolling hose.
  - (135) Disconnect suction hose leading toward right gate valve and hold open end of hose in spill container.
  - (136) Lift gate valve at least shoulder high and open gate valve.
  - (137) Walk fuel in hose back toward Y. When reaching spill container, go back to beginning of hose and walk fuel through again.
  - (138) Cap one end of suction hose.
  - (139) Disconnect gate valve and cap other end of suction hose.
  - (140) Disconnect and cap three suction hoses.
  - (141) Gather up remaining hoses and fittings and place them neatly between pump and filter separator.
  - (142) Load truck according to unit load plan.
- b. Recheck site for any fuel spills. Clean up fuel spills. Dispose of waste fuels and other fuel contaminated material in an environmentally safe manner according to local policies.
14. Load and brace FSSP equipment on 5-ton cargo truck using a forklift and pre-fabricated supports.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation SOP/operations order requirements for requisitioning, storage, handling, and disposal of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—
5. Dispatched vehicles and equipment using DD Form 1970 or DA Form 5987-E.	—	—
6. Performed before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotated on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.	—	—
7. Unloaded FSSP equipment.	—	—
8. Placed FSSP equipment on site according to layout plan.	—	—
9. Assembled FSSP equipment.	—	—
10. Informed supervisor when system is ready to operate. Performing operations	—	—
11. Operated FSSP to receive and issue product. Disassembly of FSSP	—	—
12. Evacuated product from FSSP into 5,000-gallon tank semitrailer.	—	—
13. Disassembled and place FSSP equipment in containers as appropriate.	—	—
14. Loaded and braced FSSP equipment on a 5-ton cargo truck using a forklift and prefabricated supports.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
DA FORM 3643  
DA FORM 5987-E  
DA FORM 5988-E  
DD FORM 1970  
FM 10-67-1  
TM 10-4320-343-14  
TM 10-4930-232-12&P  
TM 5-4330-211-12  
TM 5-5430-210-12

**Related**

DA PAM 710-2-1  
FM 3-100.12  
FM 3-100.4

## Operate Forward Area Refueling Equipment (FARE)

101-92F-1304

**Conditions:** Given the requirement to provide aviation refueling support on a fixed airstrip or pre-designated field location. Personnel and materials required to perform task: three military occupational specialty (MOS)-qualified (92F) Soldiers and one MOS 93H or pathfinder personnel that have required Air Traffic Control (ATC) skills; customer (aircraft with crew); proper on-specifications product; appropriate communication system; FARE system; fire extinguisher; spill kit/containers; aviation fuel contaminant test kit; millipore/Aqua-Glo test kit; two each 5-gallon water cans; appropriate personal protection equipment (PPE); risk management procedures; applicable Material Safety Data Sheets (MSDS); Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; Oil Discharge Contingency Plan (ODCP) (if required); oral or written operations order (OPORD); unit standing operating procedure (SOP) on aviation refueling operations; DA Form 3643 (Daily Issues of Petroleum Products), DA Form 5830-R (POL Credit Card/AV Fuel Identaplate Control Log), DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); and full access to all reference material.

**Standards:** Layout, assemble, operate, perform operator's preventive maintenance checks and services (PMCS), and disassemble the Fare System without damage to equipment or injury to personnel and surrounding area.

### Performance Steps

#### **DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

NOTE: Lay out the system so that the helicopter can land and refuel into the head wind or crosswind. Avoid laying out the system so that helicopters land and take off in tail winds. Choose the highest ground possible on a given site so that vapors will not collect. Use as much natural camouflage as possible. To avoid contamination, avoid laying out the system near bodies of water.

### Laying Out and Assembling the FARE System

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters.
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.

## Performance Steps

4. Wear appropriate PPE as required.

### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Dispatch FARE using DD Form 1970 or DA Form 5987-E.
  6. Perform before-, during-, and after-operations PMCS on system's components according to TM 10-4930-229-12&P. Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.
  7. Remove FARE components from vehicle or aircraft.
  8. Inspect FARE for damage that may have occurred during transport and ensure system is complete.
  9. Perform FARE set up procedures.
    - a. Position pump and filter/separator.
      - (1) Place pumping assembly on a clear, level spot.
      - (2) Face inlet port toward collapsible drum area.
      - (3) Connect female end of 5-foot suction hose to pump outlet.
      - (4) Connect another length of suction hose to first hose.
      - (5) Connect male end of second hose to inlet port of filter/separator.
    - b. Ground and bond pump and filter/separator.
      - (1) Drive one ground rod into ground between pump and filter/separator. Drive rod to level of permanent moisture in ground. Under arid conditions, keep ground moist around grounding rod. If the soil is not conductive, keep ground moist with a 50/50 water salt mixture. Epsom salts, copper sulfate, calcium chloride, and potassium nitrate may also be used.
      - (2) Attach pump ground cable clip and filter/separator ground cable clip to ground rod.
    - c. Lay out suction hoses.
      - (1) Lay out one 5-foot length of hose to connect pump and T fitting.
      - (2) Lay out four 5-foot lengths to connect T fitting and drums. Lay out butterfly valves between the T fitting and drum hose line.
    - d. Lay out discharge/dispensing hoses and nozzles.
      - (1) Lay out discharge hose so as to provide 100-foot separation (rotor to rotor) between refueling helicopters.
      - (2) Drive a grounding rod into ground approximately 10 feet from the end of each discharge hose. See performance measure 9b for grounding procedures.
    - e. Assemble and connect hoses to appropriate components of system as directed by supervisor.
- NOTE: Keep all dust caps in place until actually coupling pieces of equipment.
- (1) Attach CCR nozzles to end of discharge hoses.
  - (2) Carry nozzles back to grounding rods. Hang them on grounding rods. Attach grounding cable of nozzle to grounding rod. Also hang open port refueling nozzles on grounding rod.
  - (3) Loop hose in an "S" shape so it will not get tangled on itself.
  - (4) Assemble remainder of discharge hoses.
    - (a) Assemble suction hoses, T valve, and butterfly valves between pump inlet and storage drums. Use a male-to-male adapter fitting to connect the 500-gallon drums to system. For larger tanks, insert a butterfly valve and use a 2- to 4-inch coupling adapter.
    - (b) Recheck all fittings and couplings to make sure they are locked tight. Check grounds to pumps, filter/separators, and fueling nozzles.

**Performance Steps**

- f. Position fire extinguishers. Place one fire extinguisher at pump and one by each combination ground rod/nozzle hanger.
- g. Place one five-gallon water can at each ground rod/nozzle hanger.
- h. Camouflage system.
  - (1) Use natural features available to camouflage FARE.
  - (2) If spray paint is available, use earth and grass tones to dull and conceal couplings and fittings.

**10. Operate FARE system.**

- a. Open all system valves.
- b. Prime pump.
  - (1) If fuel source is higher than pump, use gravity to prime.
    - (a) Close water drain valve on filter/separator and open air vent.
    - (b) When fuel can be observed in sight glass of filter/separator, pump is primed. Close filter/separator air vent.
  - (2) If pump is higher than fuel source, use manual prime method.
    - (a) Obtain two gallons of fuel in a clean metal can.
    - (b) Take priming plug off top of pump, fill pump case with fuel, and replace priming plug.
    - (c) Open filter/separator air vent and make sure water drain valve is closed.
- c. Start pump and achieve full system prime.
  - (1) Depending on how far fuel must be lifted, operate pump at appropriate engine speed to achieve full prime. If fuel must be lifted less than two feet, operate pump at idle. If fuel is lifted two to five feet, operate pump at a medium speed. If fuel must be lifted five feet or more, operate pump at full throttle.
  - (2) When pump reaches full prime (indicated by slow down of pump speed), reduce pump speed to prevent damage to filter/separator.
  - (3) Check to see that pump reaches full prime within four minutes. If full prime is not reached in five minutes, shut down system. Check for following problems which would prevent system from priming:
    - (a) Closed valves between fuel source and pump.
    - (b) Air leaking into system at a coupling or priming plug.
    - (c) Sufficient fuel in pump.
    - (d) Damage to pump.
    - (e) Suction lift too great.
  - (4) When system reaches full prime, look for leaks and twisting and ballooning of hoses. Observe filter/separator pressure differential indicator to ensure filter/separator is operating properly. If any of these problems occur, immediately shut down system and correct them.
- d. As soon as system is full of fuel, draw samples from each refueling nozzle for visual sampling and Aqua-Glo testing according to FM 10-67-1, Appendix E. If dirt or other contamination is visible in sampling, flush the discharge lines into a suitable waste fuel container and resample it. If contamination is still present, notify the supervisor immediately. Do not use system for refueling.

NOTE: Fuel used at a forward area refueling point must be sampled, tested, and classified. If FARE System has a two port 500-gallon collapsible drum and if fuel has not been tested or moved within the last 24 hours, fuel must be recirculated and tested. If not moved, go to refuel procedures.

- e. Recirculate FARE System using double port bags only.
  - (1) Move discharge hose back to other end of fuel drum being recirculated.
  - (2) Connect elbow valve to other end of fuel drum.
  - (3) Connect discharge hose to elbow valve.
  - (4) Start pump.
  - (5) Open elbow valve on fuel drum.
  - (6) Recirculate fuel drum three to five minutes before taking samples.
  - (7) Repeat steps for other fuel drum using opposite discharge hose.
  - (8) Perform Millipore and Aqua-Glo tests as required according to TM 5-6630-218-10.

## Performance Steps

### f. Refuel aircraft.

#### CAUTION

Wear appropriate personal protective equipment. Ensure sleeves are completely rolled down and uniform is buttoned up all way to collar.

- (1) Guide aircraft into position using proper hand and arm signals according to FM 3-04.111 and FM 10-67-1.
- (2) Make sure all aircraft armaments are set to SAFE.
- (3) Deplane passengers and take them to passenger marshaling area. The pilot will remain on board. Crew member(s) may assist with refueling by manning fire extinguisher.
- (4) Carry fire extinguisher from grounding rod to side of aircraft by fill port.
- (5) Make sure all radios (except the one used by pilot to monitor air traffic control) are turned off. Inform pilot that he/she must not transmit while actual refueling is taking place.
- (6) If required, lock open port adapter onto CCR nozzle for open port refueling.
- (7) Ground and bond nozzle to aircraft.
  - (a) Insert nozzle bond plug into bond plug receiver on aircraft or attach connector clip to a bare metal part of aircraft (usually the skid).

#### CAUTION

Never attach the clip to a radio antenna or propeller/rotor.

- (b) When using CCR nozzle, ground it to grounding rod.
  - (8) Remove dust cap from nozzle and remove plug from aircraft fill port. Do not put dust cap on ground.
- g. Shut down FARE system.
  - (1) Replace plug of aircraft fill port. Recap nozzle.
  - (2) Unplug nozzle bonding plug or release connector clip. Carry nozzle back to its hangar. Do not lay it on ground or drag it across the ground.
  - (3) Remove fire extinguisher. Take fire extinguisher back to its position by ground rod.
  - (4) Board crew and passengers.
  - (5) Have pilot or crew chief sign for fuel on DA Form 3643 or DA Form 5830-R.
  - (6) Direct aircraft to lift off.
  - (7) Shut off pump if no other aircraft are in sight or expected to arrive shortly or if you are preparing to disassemble system.
11. Disassemble, drain, and stow FARE system.
  - a. Close elbow coupling to fuel drum.
  - b. Place a suitable container under connection at outlet of filter/separator. Disconnect outlet coupling and put end of discharge hose into container.
  - c. Open filter/separator air vent. Drain fuel from filter/separator into container. Plug and cap filter/separator inlet and outlet. Close air vent and drain valves.
  - d. Lift nozzle end of hose. Disconnect nozzle. Plug nozzle inlet and set it aside. While another soldier holds open end of hose up, walk fuel in hose back toward Y fitting. When Y fitting is reached, lift it. Holding Y fitting up and disconnecting drained hose, cap Y outlet. Go back out same section of hose line and disconnect coupling between two 50-foot lengths. Cap outer end of hose and use capped end to reel up hose.
  - e. Repeat procedure in performance measure (d) for other 50-foot hose.
  - f. Drain remaining fuel from Y fitting and from 5-foot length of suction hose into container. Disconnect and plug Y inlet. Cap and plug length of suction hose.



**Performance Steps**

- g. Move container of drained fuel over to pump. Drain pump casing and remaining lengths of suction hose into container. Cap and plug pump inlet and outlet. Close container of drained fuel.

NOTE: This fuel may not be used to fuel aircraft until it has been sampled, tested, and found to be on specification. If disposal is required, ensure local SOP's and environmental regulations are followed.

- 12. Disassemble and store camouflage equipment.
  - a. Stow each component in space provided in frame and canvas container.
  - b. Place fire extinguishers with packaged components of systems.
  - c. Remove ground rods and stow them in suction hose containers.
  - d. Remove 5-gallon water can and stow with equipment.
- 13. Complete DA Form 3643 (DA Form 5830-R if required), DD Form 1970 or DA Form 5987-E and DA Form 2404 or DA Form 5988-E, turn into supervisor.

**Evaluation Preparation:** See task Conditions and Standards.

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—
5. Dispatched FARE using DD Form 1970 or DA Form 5987-E.	—	—
6. Performed before-, during-, and after-operations PMCS on system's components according to TM 10-4930-229-12&P. Annotated on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.	—	—
7. Removed FARE components from vehicle or aircraft.	—	—
8. Inspected FARE for damage that may have occurred during transport and ensure system is complete.	—	—
9. Performed FARE set up procedures.	—	—
10. Operated FARE system.	—	—
11. Disassembled, drained, and stowed FARE system.	—	—
12. Disassembled and stored camouflage equipment.	—	—
13. Completed DA Form 3643 (DA Form 5830-R if required), DD Form 1970 or DA Form 5987-E and DA Form 2404 or DA Form 5988-E and turned in to supervisor.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measures are failed. If the soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
DA FORM 3643  
DA FORM 5830-R  
DA FORM 5987-E  
DA FORM 5988-E  
DD FORM 1970  
FM 10-67-1  
FM 3-04.111  
TM 10-4930-229-12&P  
TM 10-8110-201-14&P  
TM 5-4330-217-12  
TM 5-6630-218-10

**Related**

AR 200-1  
FM 3-100.12  
FM 3-100.4

## Perform Petroleum Assault Hoseline Operations

101-92F-1416

**Conditions:** Given the requirement to perform fueling operations in a field environment. Personnel and materials required to perform task: thirteen military occupational specialty (MOS)-qualified (92F) Soldiers to assist; spill kit/containment and clean up equipment; a complete hose line system (which consists of 13,000 feet of 4-inch collapsible hose packed in flaking boxes (one each Tri-con container); 350-gallons per minute (GPM) pumping assembly; flow control kit; roadway crossing guard; hose line suspension kit; hose line assembly; hose line packing kit and repair kit; fire extinguishers; trucks; evacuation kit; air compressor (250 cubic feet per minute [CFM]), forklift 10,000-pounds; risk management procedures; applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE); Facility Response Plan (FRP); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)); and full access to all reference material.

**Standards:** Dispatch equipment. Layout, assemble, perform operator's preventive maintenance checks and services (PMCS), operate, and disassemble the Assault Hoseline System (AHS) without damage to equipment, injury to personnel, or pollution of the environment and adhere to MSDS.

### Performance Steps

#### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

NOTE: In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements of the task before performing it to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.

## Performance Steps

4. Wear appropriate PPE as required.

### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Perform before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.
6. Lay assault hoseline according to TM 10-3835-241-14&P and FM 5-482.
  - a. Load three to five flaking boxes on a truck. Ensure the boxes are nested properly and retainer pins are in place. Secure the boxes on the truck to prevent sliding.
  - b. Replace the plywood hose retainers with the fabric hose retainers once the boxes are loaded on the truck.
  - c. Connect the hoses in the boxes prior to laying the hose.
  - d. Distribute the hose along the route at recommended maximum speed of 20 miles per hour (MPH).
    - (1) Restrain the leading edge of the hose as the first 100 feet of hose is pulled from the box.
    - (2) After the first 100 feet of hose are on the ground, release the hose as the weight of the hose will be sufficient to pull it from the boxes.
  - e. Walk the line as the host is distributed to straighten out undesirable kinks and bends and to remove small obstructions.
  - f. Lay the hose across streams.
    - (1) Suspend the hose on the existing bridge using improvised brackets if possible.
    - (2) Lay the hose on the streambed of narrow streams that are not prone to flooding if a bridge is not available.
    - (3) Suspend the hose from the cable across wider and flood prone streams.
  - g. Suspend the hose on the cable to cross deep and steep gaps.
  - h. Lay the hose across roads and railroads.
    - (1) Lay the hose under an existing bridge or culvert if possible.
    - (2) If no bridge is available, lay the hose under the roadbed (using hose crossing guard for roads or metal pipe for railroads) or suspend the hose from the cable over the roadbed.
  - i. Insert pumping stations into hose line.
    - (1) Insert a pumping station every 15,000 feet on level ground only.
    - (2) For every 25-foot increase in elevation of the hose line, decrease the distance between pumping stations 1,000 feet.
    - (3) For every 25-foot decrease in elevation, increase the distance between pumping stations 1,000 feet.
  - j. Insert a pressure storage tank, if necessary.
    - (1) If any elevation differences greater than 450 feet exist along the length of the hose line, insert a storage tank into the hose line at the base of the slope to relieve static pressure on the hose line. This will keep static pressure below the maximum safe pressure of 150 pounds per square inch (psi).
    - (2) For placement of pumping stations, the hose line is considered to restart at the pressure reduction tank outlet.
  - k. Compensate for the hose line inlet and outlet pressure variations.
    - (1) Adjust the outlet pressure of the hose line by turning the discharge cylinder pressure knob on the pumping unit in the direction indicated on the knob for the desired discharge pressure.

**Performance Steps**

- (2) If the first pump in the hose line system does not have an available inlet pressure of 20 psi provided from storage tanks, substitute a self priming flood pump (the fuel system supply point pump is recommended as a substitute). Operate this pump at a speed, which will provide a suction pressure of between 5 and 20 psi.
- l. Insert the check valves into the hose line at the downstream end of the discharge manifold section at each pump and near the bottom of the long upgrade sections.
- m. Place drip pans along the hose line where leaks are likely to occur.

**CAUTION**

Wear the appropriate personal protective equipment (such as goggles/face shield, chemical protective gloves, and hearing protection).

- 7. Operate the hose line pump.
  - a. Perform before-operations PMCS on the pump according to task 101-92F-1415.
  - b. Start the pump.
  - c. Raise the system pressure to its maximum safe operating pressure of 150 psi in steps of 50 psi at a time. Inspect the length of hose line at each increment of psi before raising the pressure higher. Stop the system immediately if leaks occur. Report spills immediately to your supervisor and clean them up.
- 8. Evacuate the 4-inch hose line according to FM 5-482.
  - a. Evacuate the product from the hose line according to FM 5-482 using the evacuation kit or by gravity if the hose line gradient allows.
    - (1) Insert the hose clamp on the discharge hose line at pump one.
    - (2) Disconnect the hose line at pump one and attach the ball injector with the ball.
    - (3) Apply the hose clamp upstream from pump two.
    - (4) Attach the ball receiver ahead of the strainer (or in place of strainer).
    - (5) Inject compressed air behind the ball in the hose line.
    - (6) Remove the hose clamps.
    - (7) Operate pump two as you apply 20 to 25 psi of compressed air to the ball to remove fuel from the hose line.
    - (8) Repeat steps (1) through (7) for subsequent pump stations.
  - b. Evacuate the air and vapor from the hose line according to FM 5-482.
    - (1) Once the fuel is removed from the section of hose line, cap its terminal end.
    - (2) Attach the educator to the ball injector on the inlet side of the hose.
    - (3) Attach the air compressor hose to the inlet side of educator. Operate the air compressor approximately ten minutes per 1,000 feet of hose to evacuate the air and vapor.
- 9. Retrieve and pack a 4-inch hose line according to the procedures given in FM 5-482.
  - a. Place flaking boxes along the hose line at 1,000-foot intervals. Retain the last box on the collecting vehicle.
  - b. Pack the hose in flaking boxes.
    - (1) Place the end of the hose at the left front of the flaking box.
    - (2) Lay the hose along the length of the box on the left side.
    - (3) Lay the hose from left to right across the rear of the box and thereafter back and forth across the width of the box from rear to front.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—
5. Performed before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotated on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.	—	—
6. Laid a 4-inch hoseline according to FM 5-482 and TM10-3835-241-14&P.	—	—
7. Operated the hose line pump.	—	—
8. Evacuated the 4-inch hose line according to FM 5-482.	—	—
9. Retrieved and packed a 4-inch hose line according to the procedures given in FM 5-482.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measures are failed. If the soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 2404
- DA FORM 5987-E
- DA FORM 5988-E
- DD FORM 1970
- FM 10-67-1
- FM 5-482
- TM 10-3835-219-14
- TM 10-4320-343-14
- TM 5-4310-452-14

**Related**

- FM 3-100.12
- FM 3-100.4

**Operate Advanced Aviation Forward Refueling System (AAFARS)****101-92F-1501**

**Conditions:** Given the requirement to provide aviation refueling support on a fixed airstrip or pre-designated field location. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers and one MOS 93H or pathfinder personnel that have required Air Traffic Control (ATC) skills; customer (aircraft with crew); proper on-specifications product; AAFARS system; fire extinguishers; spill kit/containers; appropriate communication system; personal protective equipment (PPE); risk management procedures, applicable Material Safety Data Sheets; Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous (HW/HM) material management policy; unit standing operating procedure (SOP); oral or written operations order (OPORD); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); DA Form 3643 (Daily Issues of Petroleum Products); and full access to all reference material.

**Standards:** Layout equipment at selected site, assemble and perform operator's preventive maintenance checks and services (PMCS). Operate, perform fuel quality surveillance prior to servicing aircraft, maintain fuel accountability record, and disassemble the AAFARS without damage to equipment or injury to personnel.

**Performance Steps****DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

**DANGER**

**DEATH OR PERSONAL INJURY MAY RESULT FROM THE EXPLOSION OF FUEL FUMES EXPOSED TO AN OPEN FLAME OR SPARK OR TO STATIC DISCHARGE. DO NOT PERMIT SMOKING, ANY OPEN FLAME, OR SPARK PRODUCING EQUIPMENT WITHIN FIFTY (50) FEET OF AAFARS. ENSURE ALL EQUIPMENT IS WELL GROUNDED PRIOR TO COMMENCING ANY OPERATION OR MAINTENANCE TASK. ALWAYS ENSURE THE GROUND CONNECTION FROM THE AIRCRAFT IS COMPLETE PRIOR TO BEGINNING ANY FUELING OPERATION.**

## Performance Steps

### CAUTION

All couplings have caps that must be removed before a connection is made. Ensure the cap remains in place until just before connection to prevent contamination of the fueling system by foreign materials. Once the caps are removed, couple adjacent caps to reduce the probability of foreign materials contaminating the aircraft fuel.

NOTE: Lay out system so that helicopter can land and refuel into head wind or crosswind. Avoid laying out system so that helicopters land and take off in tail winds. Choose highest ground available to prevent vapors accumulation. Make the most use of natural concealment. Avoid laying out the system near bodies of water to avoid contamination.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
3. Wear appropriate PPE as required.

### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

4. Dispatch AAFARS using DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)) and DA Form 2404 or DA Form 5988-E.
  - a. Present your OF Form 346 (US Government Motor Vehicle Operator's Identification Card) or DA Form 5984-E (Operator's Permit Record (EGA)) to the motor pool dispatcher to dispatch equipment.
  - b. Obtain the equipment record folder from the dispatcher once he/she has verified you are qualified to operate the equipment.
  - c. Perform before-operations PMCS on the equipment and annotate on DA Form 2404 or DA Form 5988-E appropriately.
  - d. If equipment is cleared for dispatch, present the DA Form 2404 or DA Form 5988-E to the dispatcher. Have the dispatcher sign DD Form 1970 or DA Form 5987-E and annotate who you will report to upon completion of the mission. You then sign the DD Form 1970 or DA Form 5987-E to dispatch the equipment.
5. Remove AAFARS components from vehicle or aircraft.
6. Inspect AAFARS for damage that may have occurred during transport and ensure system is complete.



**Performance Steps**

NOTE: An interlock feature of valve unisex coupling prevents disconnection of coupling when valve handle is in the open position. When Unisex coupling is not connected, the pressure tight dust cap shall be connected. Throughout this setup procedure, after connecting Unisex coupling, position handle to OPEN position, unless procedures state otherwise. Do not drag hoses over an improved or abrasive surface. This could damage or decrease life of hoses. To extend usage of hoses, they should be rolled and unrolled during setup or evacuation to prevent abrasion.

7. Perform before-, during-, and after-operations PMCS on system's components according to TM 10-4330-237-13&P. Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.
8. Assemble AAFARS and prepare for use.

**DANGER**

**DO NOT PERMIT SMOKING, OPEN FLAMES, OR SPARK PRODUCING EQUIPMENT WITHIN 50 FEET OF THE AAFARS. ENSURE ALL EQUIPMENT IS WELL GROUNDED PRIOR TO COMMENCING ANY OPERATION OR MAINTENANCE TASK.**

- a. Position containment barriers in a general shape of a "T". Place fuel drums on containment forming top of "T" and insert chocks or dirt berms on both sides of drum to prevent rolling.
- b. Position and open transportation bags. Do not open four bags containing nozzles.
- c. Remove engine module from pump-engine module.
  - (1) Unclamp exhaust pipe from exhaust manifold.
  - (2) Disconnect pumpage over temperature cable at engine module connection panel J3. Install dust caps on connectors. Wrap free end of cable around fuel transfer pump outlet.
  - (3) Disconnect fuel supply line and fuel return line at engine module. Connect free ends of lines together.
  - (4) Disengage latches to unlatch engine module from pump-engine frame and slide engine module out of frame.

**WARNING**

**The AAFARS suction and recirculation hoses are connected to the fuel drums via elbow valves with integral camlock couplers. When the elbow valve coupling is closed, the valve stem is extended; when open, it is retracted. The stem travel is opposite that of conventional valves and requires the operator to double check valve position during system set up and tear down, since observation can be misleading. Failure to heed this warning could result in death or serious injury. Fuel spillage will occur if elbow valve coupling is opened before connection to a fuel drum. Ensure elbow valve coupling is closed before connection to fuel drum. Failure to heed this warning could result in death or serious injury.**

**Performance Steps**

NOTE: When connecting system components, open all valves as components are connected except fuel drum outlet elbow valves and filtration module inlet and outlet valves. Opening unisex coupling valves at time of connection will expedite system setup and latch couplings together. Fuel drum outlet elbow valves should remain closed until after engine is started so that engine does not have to start under load. Fuel drum inlet elbow valves may be opened after the unisex-to-camlock adapters are installed. The liquid fuel filter/separator inlet and outlet valves should remain closed until initial system flooding.

- d. Inspect eight fuel drum elbow valves coupling to ensure each elbow valve coupling is closed (valve stem fully extended). Install elbow valve coupling on outlets and inlets of all four drums.

**WARNING**

**Whenever coupling unisex couplings together, depress continuity ball and observe that ball pops back out. Failure to check or failure of ball to pop back out could allow the buildup of static electric charge that could cause an explosion and death.**

- e. Install one adapter assembly (2-inch unisex nonvalve coupling to a 2-inch male cam lock adapter) on each elbow valve coupling.
- f. Install inlet manifold to camlock quick disconnect on fuel transfer pump inlet.
- g. Position pump engine module six to eight feet from fuel drums to inlet manifold facing fuel drum outlets.

**CAUTION**

Serious injury could occur if heavy equipment is moved or lifted without sufficient personnel to do the job. The engine module should be removed from the pump-engine module for moving or lifting. If the pump-engine module must be moved as a unit, do not lift the module two feet with less than five personnel, three feet with less than six personnel, or five feet with less than eight personnel.

- h. Install 2-inch x 6-foot suction hoses as required to connect fuel drums to inlet manifold. Reposition pump engine module as required. Open valves on unisex coupling on suction hoses and inlet manifold.
- i. Install engine module in pump engine module.
  - (1) Slide engine module into pump engine frame, PTO end first. If flexible coupling will not engage, it may be necessary to rotate the flex portion slightly to align with the engine adapter.
  - (2) Latch engine module to pump engine frame.
  - (3) Clamp exhaust pipe to exhaust manifold.
  - (4) Connect pumping over temperature cable at engine module connection panel connector J3. Couple together adjacent dust caps.
  - (5) Connect fuel supply line and return line at engine module.
  - (6) Check that throttle control is at maximum position (fully right).
- j. Position fuel filter separator four to five feet from pump engine module with inlet facing fuel transfer pump.
- k. Position accessory module between pump engine module in fuel filter separator so operator has a clear view and easy access to all system components.
- l. Connect 3-inch x 6-foot discharge hose between fuel transfer pump and fuel filter separator inlet (lower port). Open shutoff valve and unisex coupling valves on discharge hose.

**Performance Steps**

- m. Connect recirculation manifold to fuel filter separator outlet (upper port) and open manifold unisex coupling valve. Do not open 3-inch unisex coupling of fuel filter separator. Rotate manifold so that 2-inch unisex coupling are facing drums and unoccupied 3-inch unisex coupling facing area selected for fueling point.
- n. On 3-inch x 2-inch x 100-foot discharge hose, identify 3-inch unisex coupling and connect discharge hose to 3-inch valve unisex coupling of recirculation manifold. Open unisex coupling valves on recirculation manifold discharge hose.

NOTE: One 3-inch x 100-foot discharge hose has a 3-inch coupling on one end and a 2-inch coupling on the other. This is the only hose in the system that can only be laid out one way.

- o. Using remaining 3-inch x 100-foot, 2-inch x 100-foot, 2-inch x 50-foot discharge hoses, elbows, and tees as required, lay out discharge hoses to selected points. Open all unisex coupling valves as connections are made.
- p. Establish recirculation path.
  - (1) At fuel drums, connect two 2-inch x 6-foot suction hoses to nonvalve coupling mounted on inlet of two inner fuel drums.
  - (2) Connect 2-inch x 6-foot suction hoses to a wye fitting. Open 2-inch unisex coupling valve on wye fitting and suction hoses.
  - (3) Connect a unisex cross fitting to free leg of wye fitting. Open 2-inch unisex coupling valve at wye cross connection.
  - (4) Connect a 2-inch x 12-foot discharge hose to cross fitting and nonvalve unisex coupling mounted on inlets of two outer fuel drums. Open unisex coupling valves at cross discharge hose connections.
- q. Connect 2-inch x 50-foot discharge hose between cross fitting and RECIRC 1 coupler on recirculation manifold. Open 2-inch unisex coupling valves at each connection.
- r. Open fuel drum inlet elbow valve couplings and 2-inch unisex valve coupling and discharge hose.
- s. Drive a grounding rod between pump engine module, accessory module, and fuel filter separator for grounding AAFARS.
- t. Connect pump engine module, accessory module, and fuel filter separator grounding cables to grounding rod.
- u. Position a fire extinguisher, spill container, and water can at each fueling point and pump engine module.
- v. Position one nozzle kit and one grounding rod at each fueling point.
- w. Drive one grounding rod at each fueling point, approximately ten feet back from discharge hose end.
- x. At each fueling point, select the nozzle for use, connect to discharge hose end, and connect nozzle grounding clamp to grounding rod.
- y. Remove engine air filter from storage cabinet in accessory module. Remove dust caps from intake manifold and install engine air filter with center clamp facing up.
- z. Verify position of toggle switches on control panel.
  - (1) Open control box cover.
  - (2) START-RUN-STOP switch in STOP position.
  - (3) INTAKE HEATER switch in OFF position.
  - (4) FAULT LIGHTS switch in ON position.
  - (5) EMERGENCY STOP switch released.
  - (6) Close control box cover.
- aa. Remove multi-conductor control cable W201 from storage cabinet in accessory module, route through cutout on upper lip of stowage cabinet, and connect to 1A1J2 on engine module. Connect adjacent dust caps together.
- ab. Remove battery power cable W202 and NATO connector end from storage cabinet in accessory module, route through cut out on upper lip of cabinet, and connect to 1A1J1 on engine module. Connect adjacent dust cap together.

**Performance Steps**

- ac. Position ENGINE SWITCH to RUN position and observe PUMPAGE HOT flashes once, ALTNTR and LOW OIL PRESSURE illuminate and remain lit, and ENGINE HOT indicator does not illuminate. If the listed conditions do not occur, determine cause before operating AAFARS.
- ad. Restore ENGINE switch to STOP position.
- ae. Fill engine fuel tank or connect external fuel source.

9. Perform operating procedures.

**WARNING**

**Death or injury may result from the explosion of fuel fumes exposed to an open flame, spark, or static discharge. Do not permit smoking, any open flame, or spark producing equipment within fifty (50) feet of AAFARS. Ensure all equipment is well grounded prior to commencing any operation or maintenance task. Always ensure the ground connection is complete prior to any refueling operation. Grounding rods should be placed within five to ten feet of all operations. Drip pans will be used to prevent environmental contamination.**

**CAUTION**

System components are subject to damage from thermal expansion. As the temperature increases, the pumpage in any component will expand. If trapped in a component, the expanding pumpage may rupture seals and cause a leak or equipment malfunction. For this reason, all system valves should remain open as long as the system is flooded. With all valves open, the hoses will absorb the expansion and protect system seals. If any component must be isolated, it should be drained or defueled immediately to prevent damage.

- a. Perform pre-operation checks.
  - (1) Conduct a visual inspection of AAFARS setup to ensure system is properly assembled and ready to pump fuel. Verify system grounding.
  - (2) Position fuel selector valve in ON or EXTERNAL ON position, according to desired fuel source.
  - (3) Verify that manual start control is fully lowered.
  - (4) At fuel drums, open fuel drum outlet elbow valve couplings allowing pumpage to flow.
- b. Perform start up of pump engine using electric starter or manually.
  - (1) Perform normal electric engine start.
    - (a) Unlatch and open control box cover.
    - (b) Release emergency stop operator.
    - (c) At control panel, hold ENGINE switch in START position until engine starts. If engine fails to start within 15 seconds, release switch and allow starter to cool for a minute before continuing. When ambient temperature is below 20 degrees F (-7 degrees C), position and hold INTAKE HEATER switch in ON position while ENGINE switch is in START position.
    - (d) Adjust control panel lights to desired brightness.

**Performance Steps**

- (e) Disconnect battery power cable from NATO connector 1A1J1 on engine module. Install dust caps on NATO connector and free end of battery power cable. Stow battery power cable in accessory module. Proceed to step 9c below.
- (2) Perform manual engine start.
  - (a) Remove manual starter from container.
  - (b) Disconnect battery cable from NATO connector 1A1J1 on engine module. Install dust caps on NATO connector and free end of battery power cable.
  - (c) Unlatch and open control box cover.
  - (d) Release emergency stop operator.
  - (e) Place START-RUN-STOP switch in RUN position.
  - (f) Disengage both engine-to-frame latches and lower the latching engine module clamp.
  - (g) At front of pump-engine module, remove two quick disconnect pins attaching coupling guard to pump-engine module. Unlatch and remove the coupling guard.
  - (h) Install flexible coupling on manual starter, align flexible coupling with adapter on engine, insert legs of manual starter bracket in pump-engine module frame, adjust position of manual starter as required to engage the flexible coupling on the manual starter with the adapter on the engine, and raise and latch the engine module clamp to hold the manual starter in position.
    - (i) Lift the manual start control knob. Tighten the lower knob.
    - (j) Press the reset button on the manual starter.
    - (k) To wind the manual starter, pull the starter rope steadily and smoothly eight full times. If the temperature is below 20 degrees F, pull twelve times. Do not exceed twelve pulls.
    - (l) Operate trip lever on the manual starter to start engine.

NOTE: The following step restores electrical stop capability to the control panel.

- (m) After engine is running, lower the manual start control fully.

**WARNING**

**Serious personal injury could result from contact with rotating parts such as the engine or starter coupling components. Keep body well clear of coupling while rotating. Do not allow loose clothing near engine where it may be caught on rotating parts. Handle coupling guard by sides when raising and keep fingers well clear of coupling.**

- c. Verify that pump outlet hose pressurizes (hose expands). If hose has not pressurized after two minutes of operation, shut down system and determine why pump has not primed.

**WARNING**

**Serious eye and skin injury could occur from venting of fuel when filter vessel manual vent valve is open. Wear suitable protective clothing and eye protection.**

- d. At the liquid fuel filter separator, depress and latch open the manual vent valve.
- e. Crack open the liquid fuel filter separator inlet valve. Allow fuel to slowly fill filter vessel, forcing air out the manual vent valve.
- f. Close the manual vent valve at first appearance of fuel.
- g. Open the liquid fuel filter separator inlet and outlet valves fully. Allow fuel to recirculate.

### Performance Steps

- h. Conduct appropriate tests as required (Aqua-Glo and particulate contaminates) steps 8 and 9.
- i. Periodically monitor condition of fuel transfer pump discharge hose. A flattened hose indicates a loss of prime. If hose remains flat for two minutes or more, shut down system and determine why pump has lost prime. The most likely cause is a large air bubble in a fuel drum(s).
- j. Periodically monitor differential pressure gauge on liquid fuel filter separator. Normal reading with clean elements is 2 to 3 psid (1.41 to 2.11 gm/mm<sup>2</sup> differential) when operating at full flow. Lower flow rates will cause element clogging at lower differential pressures. If differential pressure approaches 15 psid, notify supervisor for replacement of coalescer elements.
- k. Periodically monitor water level sight gauge on liquid fuel filter separator. The small ball should be afloat at all times. If the ball reaches top of sight gauge, water in sump has risen to highest level that can be monitored. As soon as possible, isolate filter separator by closing inlet and outlet valves, vent pressure by opening manual vent valve, and drain sump until all water has been drained
- l. Refuel aircraft.

### CAUTION

Wear the appropriate personal protective equipment. Ensure sleeves are completely rolled down and uniform is buttoned up all the way to the collar.

NOTE: Operate system in compliance with safety procedures.

- (1) Guide aircraft into position using proper hand and arm signals according to FM 3-04.111 and FM 10-67-1.
- (2) Make sure all aircraft armaments are set to "SAFE".
- (3) Deplane passengers and take them to passenger marshaling area. The pilot will remain on board. Crew member(s) may assist with refueling by manning fire extinguisher.
- (4) Carry fire extinguisher from grounding rod to side of aircraft by fill port.
- (5) Make sure all radios (except one used by pilot to monitor air traffic control) are turned off. Inform pilot that he/she must not transmit while actual refueling is taking place.
- (6) If required, lock open port adapter onto CCR nozzle for open port refueling.
- (7) Ground and bond nozzle to aircraft.

### CAUTION

Never attach clip tip a radio antenna or propeller/rotor.

- (a) Insert nozzle bond plug into bond plug receiver on aircraft or attach connector clip to a bare metal part of aircraft (usually to skid).
- (b) When using CCR nozzle, ground it to grounding rod.
- (8) Remove dust cap from nozzle and remove plug from aircraft fill port. Do not put dust cap on ground.
- (9) Verify that all valves are open.
- (10) Do not leave nozzle at any time during refueling. Stop flow of fuel if there is any emergency at refueling point.

### Performance Steps

- m. Shut down AAFARS system.
  - (1) Replace plug of aircraft fill port and recap nozzle.
  - (2) Unplug nozzle bonding plug or release connector clip. Carry nozzle back to its hangar. Do not lay it on the ground or drag it across the ground.
  - (3) Remove fire extinguisher. Take fire extinguisher back to its position by ground rod.

**Performance Steps**

- (4) Board crew and passengers.
- (5) Have pilot or crew chief sign for fuel on DA Form 3643.
- (6) Direct aircraft to lift off.
- (7) Shut off pump if no other aircraft are in sight or expected to arrive shortly or if you are preparing to disassemble the system.

10. Test for undissolved water in aviation fuel (Aqua-Glo test).

**WARNING**

**Micro filters are prolific generators of static electricity. It is essential that no unbounded metal components are present during filtration since they concentrate and develop voltage sufficient to cause static discharge within the test apparatus. This procedure requires that all metal parts and the receiver must be electrically bonded together. The fuel test apparatus and receiver must be grounded to a known ground. Death or personal injury may result from improperly grounded or bonded components.**

NOTE: The following procedure is applicable for dynamic line samples only. The fuel is to be taken directly from the system under test, through the test pad, without exposing the sample to the atmosphere or to a sample container.

a. Perform Aqua-Glo test.

- (1) Calibrate water detector.

NOTE: Calibrate the water detector prior to use each day, after each hour of use, and when the ultra violet light is replaced or the batteries are recharged.

- (2) Verify a calibrated standard is in water detector window labeled TEST PAD HERE. (Note the "Set" rating recorded on calibrated standard).
- (3) Install instrument pack on back of water detector.
- (4) Place power selector on water detector to desired position (for example, ON-INT.BAT).
- (5) Move light modulating lever below power selector fully to one side or other.
- (6) Press and hold light button located on back side of instrument pack. Hold light button until indicator needle on instrument pack is steady for 10 to 15 seconds.
- (7) When indicator reading has been steady for 10 to 15 seconds, slowly move light modulating lever on water detector in opposite direction until indicator needle on instrument pack is at zero. Always move light modulating lever in same direction when zeroing water detector in calibration or testing to eliminate errors caused by play in lever.
- (8) When indicator needle has been zeroed, observe number directly below light modulating lever on water detector. Compare number below lever with "Set" rating on calibrated standard. Lever position and "Set" point should match.
- (9) If reading in step above does not agree with calibration pad rating, adjust water detector in the following manner:
  - (a) Remove plug screw on side of instrument pack at 45 degree bend.
  - (b) Insert a small screwdriver and adjust reading to correspond with calibration set point rating.

b. Sampling.

- (1) Attach flexible extension tube to monitor housing assembly.
- (2) Verify three position lever is in STOP position.
- (3) Separate monitor housing and install monitor. Reassemble monitor housing.
- (4) Connect attached monitor housing bypass line to valve body on top of monitor housing.

**Performance Steps**

- (5) Place 1,000 milliliters (ml) sample bottle near filtration module and monitor housing assembly.
- (6) Place monitor housing assembly open line into 1,000 ml sample bottle.

**WARNING**

**The filtration module may be under pressure during the next step. Wear proper safety equipment. Prevent fuel from spilling on the ground. Use rags to prevent fuel from spraying on personnel and equipment. Death or personal injury may result.**

- (7) Attach monitor housing assembly to filtration module sample port quick disconnect.
- (8) Connect monitor housing assembly ground cables to ground point on filtration module.
- (9) Move three position lever on monitor housing to FLUSH. Flush monitor assembly immediately prior to sampling. Displace sampling line with at least two volumes of test fuel. Capture displaced fuel in 1,000 ml sample bottle.
- (10) Disconnect monitor housing bypass line from valve body on top of monitor housing.
- (11) Place three position lever on monitor housing to STOP. Remove monitor from monitor housing, open monitor, and use tweezers to insert a new test pad, making sure that treated side of pad (ORANGE) is facing upstream, to inlet side of monitor.
- (12) Reassemble monitor housing and connect monitor housing by-pass line to valve body.
- (13) Place three position lever on monitor housing to TEST position. Pass 500 ml of fuel through test pad. Accurately measure test sample quantity. The normal volume of test fuel is 500 ml. Place three position lever on monitor housing to STOP.

**WARNING**

**Use caution when disconnecting the flexible extension tube from the filtration module. Use rags to prevent fuel from spraying on personnel or equipment. Death or personal injury may result.**

- (14) Disconnect flexible extension tube from filtration module.
- c. Rating procedure.
- (1) Disconnect monitor housing bypass line from valve body.
  - (2) Remove monitor from monitor housing.
  - (3) Using tweezers, remove test pad from monitor.
  - (4) Press test pad between dry paper blotters or absorbent towels to remove excess fuel. To blot, press firmly (about five pounds of force) three or four times with heel of the hand, moving pad with tweezers.

NOTE: The test pad should be read within three minutes after sampling is initiated. If the test pad is not read immediately after sampling, it must be placed in a desiccator to prevent moisture pickup from the air. Ratings made on dried test pads, not damp with fuel, should be avoided as they will give high and erroneous readings. Rating a pad which has not been well blotted will also give a low reading as the excess fuel will absorb part of the ultraviolet (UV) light and decrease fluorescence.

- (5) Using tweezers, remove calibration standard under water detector window. DO NOT DISCARD calibration standard.
- (6) Using tweezers, put test pad under water detector window. Place power selector to appropriate power source.



**Performance Steps**

- (7) Press and hold light button located on back side of instrument pack. The ultra violet light must be on to get a reading. This can be checked by moving light modulating lever on water detector from one extreme to another. The instrument pack indicator needle should swing violently when light modulating lever is moved.
  - (8) Zero water detector by adjusting light modulating lever until there is a steady reading for 10 to 15 seconds. Always move light modulating lever in same direction when zeroing water detector to eliminate errors caused by backlash. Release light button on instrument pack when reading is complete.
  - (9) Observe light modulating lever and corresponding number. Record instrument reading (estimate to nearest tenth) and sample volume.
  - (10) Set the water detector power selector to OFF to conserve power.
  - (11) Record temperature of fuel.
  - (12) Using tweezers, remove test pad from water detector assembly for visual observation. Free water in fuel is normally well dispersed and will form an even distribution of many, small points of yellow fluorescence on test pad when illuminated by ultra violet light. Large drops of water will form a few large spots of yellow fluorescence on pad. The large spots may give erroneous readings and should be disregarded and a new sample taken.
- d. Calculations.
- (1) Instrumentation reads directly, if sample volume is 500 ml.
  - (2) Correct readings for other size samples by multiplying reading by 500/sample size in milliliters: Free water, parts per million (ppm) = (meter reading, ppm) (500) / (sample volume, ml).
- e. Reporting.
- (1) Report results to nearest whole number as ppm by volume of undissolved water in fuel, and also sample volume used in test.
  - (2) Report temperature of sample, if available.
- f. Equipment cleaning and stowage.
- (1) Fill solvent dispenser bottle from ether storage bottle. Disassemble monitor housing assembly and flush with ether. Wipe all components with a clean rag or paper towel. Pour any unused ether into ether storage bottle. Stow each item in fuel contamination test kit.
  - (2) Verify power selector on water detector is in OFF position.
  - (3) Remove instrument pack from water detector and stow both items in fuel contamination test kit.
  - (4) Secure fuel contamination test kit for transport.
11. Perform particulate contamination fuel test.

**WARNING**

**Micro filters are prolific generators of static electricity. It is essential that no unbounded metal components are present during filtration since they concentrate and develop voltage sufficient to cause static discharge within the test apparatus. This procedure requires that all metal parts and the receiver must be electrically bonded together. The fuel test apparatus and receiver must be grounded to a known ground. Death or personal injury may result from improperly grounded or bonded components.**

- a. Place fuel contamination test kit in vicinity of filtration module.
- b. Attach flexible extension tube to monitor housing assembly.
- c. Verify three position lever on monitor housing is in STOP position.
- d. Separate monitor housing.

NOTE: To avoid extraneous contamination, monitor protective plugs must be removed only for sampling

**Performance Steps**

and replaced immediately. The monitor must be opened in a laboratory.

- e. Select a monitor. Use a contamination monitor (blue and red protective plugs) for color comparison testing or a matched weight monitor (yellow and red protective plugs) for gravimetric testing.
- f. Remove bottom protective plug (outlet) from monitor and place it in a clean, safe place.
- g. Position monitor in monitor housing.
- h. Remove other protective plug (inlet) from monitor and place it in a clean, safe place.
- i. Reassemble monitor housing hand tight only. Extreme force is both unnecessary and undesirable.
- j. Ensure that monitor housing bypass line is connected to valve body on top of assembly. Place monitor housing assembly open line in a container of at least 1.3 gallon (5 liter) capacity.
- k. Connect all ground clips to filter separator ground point.
- l. Verify three position lever is in OFF position.

**WARNING**

**The filtration module may be under pressure during the next step. Wear proper safety equipment. Prevent fuel from spilling on the ground. Use rags to prevent fuel from spraying on personnel and equipment. Death or personal injury may result.**

- m. Attach monitor housing assembly to filtration module sample port quick disconnect fitting.
- n. Position three position lever to FLUSH. Displace sampling line with 0.5 gallon (2 liter) of fuel. Capture displaced fuel in a 1.3 gallon (5 liter) container.
- o. When 0.5 gallons (2 liters) of fuel have been collected, move three position lever to TEST position. Take a fuel sample of no more than 1 quart (1 liter).
- p. When required amount of fuel is collected, place three position lever in OFF position.

**WARNING**

**The one minute wait period in the next step is required as a precaution against electrostatic discharge. A static discharge from any system component could ignite the fuel or cause an explosion of fuel vapors. Do not operate the system until it has first been grounded properly. Use caution when disconnecting the flexible extension tube from the filtration module. Use rags to prevent fuel from spraying on personnel or equipment. Death or personal injury may result.**

- q. After sampling is completed, allow one minute to pass and then disconnect monitor housing assembly from sample connection on filtration module.
- r. Remove monitor from monitor housing and attach syringe to lower opening (spider web side) of monitor.
- s. Pull outward on syringe handle to draw residual fuel from monitor. If fuel remains in monitor, disconnect syringe and expel collected fuel into a suitable container. Repeat procedure as necessary to withdraw all fuel from monitor.
- t. If gravimetric method of contamination is to be used, proceed to step u. If color rating method is to be used:
  - (1) Use tweezers to pry off top of monitor.
  - (2) Use tweezers to lift test pad from monitor.

**Performance Steps**

- (3) Dry test pad by placing on absorbent paper and blotting until test pad is as dry as possible.
- (4) Use tweezers to hold test pad. Following instructions under front cover of the color rating booklet, determine rating of sample.
- (5) Report nearest rating number and sample volume used.
- u. Replace protective plugs in monitor. Handle monitor carefully. DO NOT open monitor under any circumstances before returning it to laboratory. If monitor is opened in field, it can not be used for gravimetric analysis.
- v. Place monitor in a suitable container and record following information:
  - (1) Date.
  - (2) Monitor serial number.
  - (3) Sample location and volume of sample.
  - (4) Line pressure and flow rate.
- w. Forward monitor to appropriate laboratory for analysis as soon as possible.
- x. Fill solvent dispenser bottle from ether storage bottle. Drain and disassemble monitor housing assembly and flush with ether. Pour any unused ether into ether storage bottle.
- y. Wipe all components with a clean paper towel. Return all items to fuel contamination test kit.

## 12. Remove condensation from fuel lines.

NOTE: Perform the following procedure to remove condensation from a flooded system that has been unused for an extended period (for example, overnight) during which temperature has decreased significantly.

- a. Close unisex coupling on liquid fuel filter separator outlet valve.

**CAUTION**

Never subject nozzles to auxiliary pump suction. Seals will rupture. Drain nozzle immediately after disconnecting it from system.

- b. Close discharge unisex coupling valves and disconnect and drain all nozzles.
- c. Select a fuel drum to defuel into.
- d. At selected fuel drum, close inlet elbow valve and unisex coupling valve on discharge hose, disconnect discharge hose from inlet elbow valve, connect discharge hose to flow side of auxiliary pump, and open unisex coupling valves on flow side of auxiliary pump and discharge hose.
- e. Connect auxiliary pump unisex coupling to inlet elbow valve unisex coupling and open unisex coupling valve and inlet elbow valve.
- f. Close fuel drum inlet elbow valve on remaining drums.
- g. Turn on auxiliary pump.

NOTE: After each hose is defueled and unisex coupling is closed, do not reopen unisex coupling until after defueling is completed. This will prevent introducing air into system.

- h. One at a time, open unisex valves on discharge hoses at fueling points. Close unisex valve as hose collapses.
- i. At recirculation manifold close unisex valve to refueling points to isolate discharge hoses.
- j. Turn off auxiliary pump.
- k. Disconnect inlet elbow valve from fuel drum.
- l. Disconnect discharge hose from auxiliary pump.
- m. Hold auxiliary pump over container. Open unisex coupling valve and drain fuel. Close unisex coupling valve.
- n. Hold auxiliary pump over container and disconnect auxiliary pump from inlet elbow valve.
- o. Disconnect auxiliary pump power cable from auxiliary pump module and stow cable in accessory module.
- p. Install elbow valve coupler on fuel drum and open elbow valve coupler.
- q. Open elbow valve couplers on remaining fuel drums.

### Performance Steps

- r. Start system and recirculate for 10 to 15 minutes.
- s. Install all nozzles at fueling points and open unisex couplings at nozzle.
- t. At recirculation manifold, open unisex couplings to refueling points.
- u. Commence normal operation.

#### 13. Disassembly of AAFARS system for movement.

- a. Perform defueling procedures.

NOTE: System components are subject to damage from thermal expansion. To prevent damage to equipment, ensure all components are completely defueled prior to transportation or storage. Do not attempt defueling of more than one inlet hose at a time. Fuel spillage could occur and pose a hazard to personnel and equipment.

- (1) With fuel transfer pump running.
- (2) Close all fuel drums outlet elbow valves coupling.
- (3) Close all unisex coupling at fuel drum end of suction hoses.
- (4) Beginning at fuel drums, disconnect suction hoses one at a time, open unisex coupling, hold far end of hose up higher than intake manifold, and close unisex coupling at far end (intake manifold) of suction leg. Close unisex coupling at free end of leg and install dust cap.
- (5) Repeat step (3) for each of three remaining suction legs.
- (6) Close emergency shutoff valve as soon as fuel transfer pump unloads.
- (7) At accessory module control panel, position ENGINE SWITCH to STOP position.

### CAUTION

Do not run fuel transfer pump dry. Running 15 minutes will cause damage to pump. Never subject nozzles to auxiliary pump suction, seals will rupture. Drain nozzle immediately after disconnecting it from system. Trapped fuel can cause large internal pressure that can cause damage to nozzle when temperature rises.

- (8) Close unisex coupling valves and disconnect and drain all nozzles.
  - (9) Defuel liquid fuel filter separator.
  - (10) Close unisex coupling on liquid fuel separator outlet valve.
  - (11) Disconnect discharge hose from recirculation manifold.
  - (12) Disconnect one suction hose from fuel transfer pump inlet for use in next step.
  - (13) Connect suction hose removed from fuel transfer pump inlet to defueling unisex coupling and unisex coupling on flow size of auxiliary pump. Open unisex coupling valves.
  - (14) Connect discharge hose to auxiliary pump and open unisex coupling valves.
  - (15) Connect power cable to auxiliary pump.
  - (16) Open liquid fuel filter separator manual vent valve.
  - (17) Turn on auxiliary pump to pump down liquid fuel filter separator and 3-inch x 6-foot discharge hose from fuel transfer pump.
  - (18) Close liquid filter separator inlet valve and manual valve when air is seen in sight gauge.
  - (19) Turn off auxiliary pump and close auxiliary pump unisex inlet and outlet valves.
  - (20) Disconnect discharge hose from auxiliary pump and connect to recirculation manifold full flow unisex coupling.
  - (21) Disconnect suction hose from auxiliary pump and liquid fuel filter separator.
- b. Defuel system fuel hoses.

NOTE: Auxiliary pump must be supported in the following steps.

- (1) Select a fuel drum to defuel into. Ensure to use drip pans during operations.
- (2) At selected fuel drum, close inlet elbow valve and unisex coupling valve on discharge hose, disconnect discharge hose from inlet elbow valve, and connect discharge hose to flow side of auxiliary pump and discharge hose.
- (3) Connect auxiliary pump unisex to inlet elbow valve unisex coupling and open unisex

**Performance Steps**

coupling valve and inlet elbow valve.

- (4) Close fuel drum inlet valve coupling on remaining drums.

**WARNING**

**The AAFARS suction and recirculation hoses are connected to fuel drums via elbow valves with integral cam lock couplers. When elbow coupling is CLOSED, valve stem is EXTENDED: when OPEN it is RETRACTED. The stem travel is opposite that of conventional valves and requires operator to double check valve position during system set up and tear down since observation can be misleading. Failure to heed this warning could result in death or serious injury.**

- (5) Turn on auxiliary pump.  
 (6) One at a time, open unisex valves on discharge hoses at fueling points. Close unisex valve as hose collapses.  
 (7) One at a time, disconnect inlet elbow valve cam lock coupler from other three drums hoses and allow hose to pump down and close unisex valve.  
 (8) When hoses are collapsed/defueled, close inlet fuel drum on last fuel drum.  
 (9) Turn off auxiliary pump.  
 (10) Disconnect inlet elbow valve from fuel drum.  
 (11) Disconnect discharge hose from auxiliary pump.  
 (12) Hold auxiliary pump over container. Open unisex coupling valve and drain fuel. Close unisex coupling valve.  
 (13) Disconnect auxiliary pump power cable from auxiliary pump module.
- c. Disassemble and stow equipment for movement.

**WARNING**

**The exhaust system will remain hot for some time after engine shut down. Avoid contact with exhaust system components until they have cooled sufficiently for safe handling. Serious personal injury may occur from contact with hot metal.**

**CAUTION**

Drain nozzle immediately after disconnecting it from the system. Trapped fuel can cause large internal pressure that can damage nozzle when the temperature rises. During recovery, ensure dust caps are installed on couplings immediately after disconnection. This practice will protect the couplings and reduce fuel contamination and spills.

NOTE: This procedure assumes that defueling has been completed. Even after defueling, small amounts of residual fuel will remain in the system. Place a shallow container beneath each coupling to catch drainage when coupling is disconnected.

- (1) At fueling points, remove the ground rods, drain trapped fuel and bag the nozzles, and return the nozzle kits and ground rods to the recovery area.

**Performance Steps**

- (2) At fueling points, start at end of discharge hose and roll discharge hose toward first fitting. Close disconnect unisex couplings and strap hoses. Continue process until all hoses are rolled and secured. Return discharge hoses to recovery area.
- (3) Disconnect suction hoses, strap and return to recovery area.
- (4) Return all wyes, tees, elbows, and crosses to recovery area.
- (5) Disconnect and return recirculation manifold to recovery area.
- (6) At each fuel drum, remove the inlet and outlet elbow valves and return valves to recovery area.
- (7) At recovery area, sort and stow all fuel handling AAFARS components.
- (8) Remove and stow ground cables on liquid fuel filter separator, pump-engine module, and accessory module.
- (9) Return auxiliary pump module to recovery area.

**WARNING**

**Serious injury could occur if heavy equipment is moved or lifted without sufficient personnel to do the job. Always use sufficient personnel to move or relocate the liquid fuel filter separator. Use proper physical lifting procedures or use a suitable lifting device or dolly. Wear safety shoes, gloves, and other suitable protective clothing.**

- (10) Return liquid fuel filter separator to recovery area.
- (11) Remove ground rod at pumping station and return to recovery area.
- (12) Disconnect and stow electrical cables in accessory module compartment. Install dust caps on connectors.
- (13) Disconnect inlet manifold from transfer pump quick disconnect. Drain inlet manifold and stow in storage module.
- (14) If attached, remove manual starter from pump-engine module and stow in container.
- (15) Remove air cleaner from engine and stow in accessory module. Install dust cap on intake manifold.
- (16) Return accessory module to recovery area.
- (17) Remove engine module from pump-engine module.
  - (a) Unclamp exhaust pipe from exhaust manifold.
  - (b) Disconnect pumpage over temperature cable at engine module connection panel. Install dust caps on connectors. Wrap free end of cable around fuel transfer pump outlet.
  - (c) Disconnect fuel supply and return lines at engine module. Connect free ends of lines together.
  - (d) Unlatch engine module from pump-engine frame and slide engine module out of frame.
- (18) Return engine module to recovery area.
- (19) Return pump-engine module to recovery area.
- (20) Install engine module in pump-engine module.
  - (a) Slide engine module into pump-engine module, PTO end first. If flex coupling will not engage, it may be necessary to rotate the flex portion slightly to align with the engine adapter.
  - (b) Latch engine module to pump-engine frame.
  - (c) Clamp exhaust pipe to exhaust manifold.
  - (d) Connect pumpage over temperature cable at engine module connection panel connector J3. Connect adjacent dust caps together.
  - (e) Connect fuel supply and return lines at engine module.

**Performance Steps**

(21) Clean spill containment units, flood and bag, and return to recovery area.

14. Complete DD Form 1970 or DA Form 5987-E and DA Form 2404 or DA Form 5988-E and DA Form 3643 and turn in to supervisor.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
3. Wore appropriate PPE as required.	—	—
4. Dispatched AAFARS using DD Form 1970 or DA Form 5987-E and DA Form 2404 or DA Form 5988-E.	—	—
5. Removed AAFARS components from vehicle or aircraft.	—	—
6. Inspected AAFARS for damage that may have occurred during transport and ensure system is complete.	—	—
7. Performed before-, during-, and after-operations PMCS on system's components according to TM 10-4330-237-13&P. Annotated on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.	—	—
8. Assembled AAFARS and prepared for use.	—	—
9. Performed operating procedures.	—	—
10. Tested for undissolved water in aviation fuel (AQUA GLO Test).	—	—
11. Performed particulate contamination fuel test.	—	—
12. Removed condensation from fuel lines.	—	—
13. Disassembled of AAFARS system for movement.	—	—
14. Completed DD Form 1970 or DA Form 5987-E and DA Form 2404 or DA Form 5988-E and DA Form 3643 and turned into supervisor.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References****Required**

DA FORM 2404  
 DA FORM 3643  
 DA FORM 5984-E  
 DA FORM 5987-E  
 DA FORM 5988-E  
 DD FORM 1970  
 FM 10-67-1  
 FM 3-04.111  
 OF FORM 346  
 TM 10-4330-237-13&P

**Related**

FM 3-100.12  
 FM 3-100.4  
 TM 5-6630-218-10

**References**

**Required**

TM 10-4930-250-13&P

TM 10-4930-351-14

TM 10-8110-201-14&P

**Related**



## Operate Remote Refueling Rearming Deployable Distribution System (R3D2S)

### 101-92F-1502

**Conditions:** Given the requirement to perform fueling operations in a field environment. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers and one MOS 93H or pathfinder personnel that have required Air Traffic Control (ATC) skills; aircraft (UH-60) and customer aircraft; appropriate communication system; R3D2S Refueling System; 120-gallons per minute (GPM) pump module; 50-foot power cable; Forward Area Refueling Equipment (FARE); filter separator; 8 each, 2-inch x 5-foot suction hoses; sample adapter; HEMTT Tanker Aviation Refueling System (HTARS); 4 each, 50-foot x 2-inch discharge hoses; fire extinguishers; spill containers/kit; personal protective equipment (PPE); special adapter for hook-up between FARE and HTARS; grounding equipment; risk management procedures; Material Safety Data Sheet (MSDS) or Hazardous Material Information Sheets (HMIS); Water Detection Kit; Facility Response Plan (FRP); DA Form 3643 (Daily Issues of Petroleum Products); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); and full access to all reference material.

**Standards:** Layout equipment at selected site, assemble and perform operator's preventive maintenance checks and services (PMCS), operate and perform fuel quality surveillance prior to servicing aircraft, maintain fuel accountability record, and disassemble R3D2S without damage to equipment or injury to personnel.

#### Performance Steps

NOTE: Before performing this task, read and comply with the appropriate MSDS. Wear PPE when appropriate. Clean and secure the PPE upon completion of the task. Apply environmental procedures according to FM 3-100.4. Comply with unit standing operating procedures (SOPs), operations order (OPORD), local regulations, and Host Nation (HN) laws for drip pans or secondary containment devices. When laying out the system, ensure pump unit and filter separator are positioned on the outside of rotor blades to aircraft.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
3. Wear appropriate PPE as required.

#### **CAUTION**

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

4. Dispatch R3D2S using DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)) and DA Form 2404 or DA Form 5988-E.
  - a. Present your OF Form 346 (US Government Motor Vehicle Operator's Identification Card) or DA Form 5984-E (Operator's Permit Record (EGA)) to the motor pool dispatcher to dispatch equipment.
  - b. Obtain equipment record folder from dispatcher once he/she has verified you are qualified to operate equipment.

**Performance Steps**

c. Inventory system:

- (1) Check to ensure all of the components are on hand and serviceable for operations. Follow the procedures for performing before-operations PMCS using TM 10-4930-229-12&P (FARE) and TM 5-4930-237-10 (HTARS).
- (2) Log all action/deficiencies on DA Form 2404 or DA Form 5988-E (reference: DA Pamphlet 750-8).
- (3) Notify supervisor immediately of any missing components to system or deficiencies of equipment.
- (4) Give form to supervisor after operations.

5. Remove R3D2S components from aircraft.

6. Inspect R3D2S for damage that may have occurred during transport and ensure system is complete.

7. Perform before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.

8. Set up R3D2S.

a. Position pump unit and filter separator.

- (1) Place pump unit and filter separator outside of rotor blades of defueling aircraft.
- (2) Face inlet port of pump unit towards defueling aircraft.
- (3) Place two each, 2-inch by 5-foot suction hose between pump unit and filter separator.
- (4) Connect female end of 2-inch x 5-foot suction hose to pump outlet side.
- (5) Connect other 2-inch x 5-foot suction hose to first.
- (6) Connect male end of 2-inch x 5-foot suction hose to inlet port of filter separator.
- (7) Place fire extinguisher, 5-gallon water container, and grounding rod between pump unit and filter separator.
- (8) Drive grounding rod into ground at appropriate depth according to FM 10-67-1, Chapter 2, Table 2-6.
- (9) Attach pump unit ground cable clip and filter separator ground cable clip to grounding rod.

b. Layout and assemble suction hoses from pump unit to defueling aircraft.

- (1) Layout two each, 2-inch x 5-foot suction hoses from pump unit to defueling aircraft and 1 each, T fitting (will have two male connection and one unisex connection).
- (2) Layout four each, 2-inch x 5-foot suction hoses from T fitting to defueling aircraft.
- (3) Layout D-1 nozzle next to last hose going to aircraft.
- (4) Layout fire extinguisher, 5-gallon water container, drip pan, and grounding rod approximately 10 feet from de fueling aircraft.
- (5) Connect male end of 2-inch x 5-foot suction hose to inlet port on pump unit.
- (6) Connect second hose male end to female end of first hose going to defueling aircraft from pump unit.
- (7) Connect male end of T fitting to female end of 2-inch x 5-foot suction hose.
- (8) Connect female end of 2-inch x 5-foot suction hose to male end of T fitting.
- (9) Connect last three 2-inch x 5-foot suction hoses together towards defueling aircraft.
- (10) Drive grounding rod into ground at appropriate depth according to FM 10-67-1, Chapter 2, Table 2-6.
- (11) Connect D-1 nozzle to 2-inch x 5-foot suction hose. Attach nozzle ground cable clip to grounding rod. Place nozzle other drip pan.
- (12) Attach second cable to grounding rod (clip both ends to grounding rod).

c. Assemble dispensing points.

- (1) Connect sampler adapter to filter separator outlet.
- (2) Connect unisex fitting to sampler adapter.
- (3) Roll out and connect 2-inch x 50-foot discharge hose (HTARS) to unisex fitting. Open valve on unisex fitting to hose.
- (4) Connect T fitting at end of hose.
- (5) Unroll 2-inch x 50-foot discharge hose from left and right side of T fitting.

**Performance Steps**

- (6) Connect 2-inch x 50-foot discharge hose from left and right side of T fitting.
- (7) Place one each elbow at end of 2-inch x 50-foot discharge hose.
- (8) Unroll 2-inch x 50-foot discharge hose at end of each elbow fitting.
- (9) Connect 2-inch x 50-foot discharge hose to end of each elbow fitting.
- (10) Drive grounding rod into ground approximately ten feet from end of each discharge hose.
- (11) Layout fire extinguisher, 5-gallon water container, and drip pan.
- (12) Connect D-1 nozzle to end of each 2-inch x 50-foot discharge hose.

NOTE: Keep all dust caps in place until actually coupling of equipment.

- (13) Loop hose in a "S" SHAPE so it will not get tangled on itself. Hang nozzle on grounding rod.
- d. Hook up to defueling aircraft.
- (1) Ground aircraft, using grounding cable from grounding rod.
  - (2) Bond nozzle to aircraft in one of two ways. Insert bonding plug into receiver on aircraft or attach clip of nozzle bonding cable to bare metal of aircraft other than antenna.
  - (3) After nozzle is bonded to aircraft, remove dust cap from nozzle and open aircraft fill port.
  - (4) Mate nozzle to aircraft fill port. Turn handle to right to lock D-1 nozzle. Pull back on handle to ensure nozzle is locked.

NOTE: The electrical power cable (HMO22-456) is designed to connect to AERO MED. KIT receptacle (P276). A 15 amp electrical outlet is required for pump.

- (5) Connect electrical power cable to AERO MED. KIT receptacle located below the gunner's window on UH-60.
  - (6) Press push to test light on Micro FARE electrical control box to check for power. Light will illuminate if electrical power is present in control box (light may be difficult to see in daylight).
- e. Recirculate fuel in system.
- (1) Open D-1 nozzle on defueling aircraft.
  - (2) Connect one dispensing point to unisex connection between pump unit and aircraft.
  - (3) Operate pump by turning switch on MICRO-FARE electrical control box ON and OFF. In ON position, power light should be illuminated indicating electrical power is being supplied to pump. Pump is self priming; however, pump should not be run for more than one minute without transferring fuel.
  - (4) Open outlet valve on filter separator. Check hoses for leaks.
  - (5) Open valve on 2-inch x 50-foot discharge hose.
  - (6) Open valves to each 2-inch x 50-foot dispensing point. Check for leaks.
  - (7) Open nozzle to unisex fitting between aircraft and pump unit.
  - (8) Recirculate fuel for two minutes.

NOTE: As soon as the system is full of fuel, draw samples for visual sampling from each refueling nozzles. If dirt or other contamination is visible in sampling, flush discharge lines into a waste fuel container and resample it. If contamination is still present, notify supervisor immediately. Do not use system for refueling.

- (9) Stop pump unit. Close valves on unisex fittings and disconnect nozzle from tee fitting.
- (10) Take nozzle back to dispensing point. Place nozzle on hanger/grounding rod.
- (11) Repeat steps (1) through (10) for other dispensing point.

9. Operation procedures.

- a. Operate pump by turning switch on control box to ON position.
- b. Soldier operating nozzle guides aircraft into position. Check with pilots to ensure that all armaments are on safe.
- c. Members of crew, except pilot who may remain at controls if necessary, should deplane and assist with refueling or man fire extinguisher.
- d. Carry fire extinguisher to aircraft and place it within arms reach of aircraft fill port.
- e. Make sure all radios are off (except those that used by pilot to monitor air traffic control).
- f. Press air eliminator valve on filter separator to release air. Close at sight of fuel.
- g. Ground aircraft using grounding cable from grounding rod.

**Performance Steps**

- h. Bond nozzle to aircraft in one of two ways. Insert bonding plug into receiver on aircraft or attach clip of nozzle bonding cable to bare metal of aircraft other than antenna.
- i. After nozzle is bonded to aircraft, remove dust cap from nozzle and open aircraft's fill port.
- j. Mate CCR nozzle to aircraft fill port. Pull on handle to ensure nozzle is locked.
- k. Pull back on control handle latch, and then push flow control handle up toward aircraft into FLOW position.
- l. If aircraft is being filled completely, watch back of nozzle. A red indicator will pop out of back of nozzle when aircraft is full.
- m. Pull back on flow control handle to move it into NO FLOW position.
- n. Observe filter separator pressure differential gauge for proper operations of filters.
- o. Observe system for leaks and twisting of hoses. Shut down system immediately and correct these problems if observed.
- p. Pull back on control handle to unlatch nozzle.
- q. Replace cover of aircraft fill port and put dust cap back on nozzle.
- r. Unplug nozzle bonding plug or release bonding clip. Carry nozzle back to grounding rod and hang back up. Do not lay it across ground.
- s. Release grounding cable clip from aircraft.
- t. Take fire extinguisher back to a position near ground rod/hanger.
- u. Turn off pump.
- v. Annotate on DA Form 2404 or DA Form 5988-E any faults found during PMCS on equipment and turn in to supervisor.

10. Disassemble system.

**CAUTION**

Up to four ounces of fuel can be trapped between closed "dry break" valves in the unisex couplings. Care should be taken to control spillage of this trapped fuel when separating couplings.

- a. Turn switch on MICRO-FARE control box OFF.
- b. Close valves in unisex couplings that attach suction and discharge hoses to pump module.
- c. Turn pump so that ports are in opposite directions.
- d. Reconnect suction hose to DISCHARGE OUTLET on module.
- e. Reconnect discharge hose to SUCTION OUTLET on module.
- f. Open unisex valves.
- g. Close valves in adjoining unisex couplings and remove nozzles from dispensing hoses as fuel is removed from lines.
- h. Activate pump using switch on MICRO-FARE electrical control box.

**CAUTION**

Some fuel will remain trapped in MICRO-FARE pump module, suction hose, and dispensing hoses after suction and rolling of HTARS lines has been complete. To avoid spilling this trapped fuel, valves in unisex couplings must remain closed after system is disassembled (these valves cannot be opened if protective caps are in place). All trapped fuel should be drained into an appropriate container when operational situation permits.

- i. Tightly roll dispensing hoses from nozzle end toward pump module while pump is defueling fuel from hose.
- j. Close valves in unisex couplings as fuel is removed.

**Performance Steps**

- k. Disconnect hoses and put on protective caps to keep out contaminants.
  - l. Shut off pump when hoses collapse.
  - m. Close valves on filter separator.
  - n. Disconnect suction hoses between filter separator and pump module. Drain hoses into container.
  - o. Disconnect suction hoses from pump module to defueling aircraft.
  - p. Manually drain fuel from suction hoses back into fuel tank.
  - q. Close nozzle and disconnect from aircraft being defueled.
  - r. Disconnect suction hose from nozzle.
  - s. Wipe equipment with a clean cloth to remove dirt, dust, moisture, and fuel.
  - t. Perform after-operations PMCS on system components.
  - u. Store pump module and hoses.
11. Annotate on DA Form 2404 or DA Form 5988-E any faults found during PMCS on equipment and turn in to supervisor.
  12. Clean up any spills and reported as required by unit policies and procedures and applicable environmental laws to your immediate supervisor.
  13. Record all issues on DA Form 3643 and turn in to supervisor.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
3. Wore appropriate PPE as required.	—	—
4. Dispatched R3D2S using DD Form 1970 or DA Form 5987-E and DA Form 2404 or DA Form 5988-E.	—	—
5. Removed R3D2S components from aircraft.	—	—
6. Inspected R3D2S for damage that may have occurred during transport and ensure system is complete.	—	—
7. Performed before-, during-, and after-operations PMCS on system's components according to appropriate TMs. Annotated on DA Form 2404 or DA Form 5988-E faults found while performing PMCS.	—	—
8. Performed set up of R3D2S system.	—	—
9. Operated R3D2S system.	—	—
10. Disassembled R3D2S system.	—	—
11. Annotated on DA Form 2404 or DA Form 5988-E any faults found in during- or after-operations PMCS on equipment and reported to supervisor.	—	—
12. Cleaned up any spills and reported as required by unit policies and procedures and applicable environmental laws to your immediate supervisor.	—	—
13. Recorded all issues on DA Form 3643 and turned in to supervisor.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
DA FORM 3643  
DA FORM 5984-E  
DA FORM 5987-E  
DA FORM 5988-E  
DA PAM 750-8  
DD FORM 1970  
FM 10-67-1  
OF FORM 346  
TM 10-4930-229-12&P  
TM 5-4930-237-10

**Related**

FM 3-04.111  
FM 3-100.4

## Operate Load Handling System Modular Farm (LMFF)

**101-92F-1503**

**Conditions:** Given the requirement to perform fueling operations in a field environment. The Soldier (assigned to a Class III Section) must layout, assemble, perform operator's preventive maintenance checks and services (PMCS), operate, and disassemble the LMFF without damage to equipment, injury to personnel, or pollution to environment. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers to assist; LMFF; Load Handling System/Palletized Load System (LHS/PLS) trucks to haul/download equipment; communication system; risk management procedures; fuel source; fire extinguishers; personal protective equipment (PPE); fuel spill kit/containers; Facility Response Plan (FRP); Oil Discharge Contingency Plan (ODCP) (if required); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; applicable Material Safety Data Sheet (MSDS) or Hazardous Material Information Sheet (HMIS); an oral or written order; unit standing operating procedure (SOP); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); DA Form 3643 (Daily Issues of Petroleum Products); and full access to all reference material.

**Standards:** Position and emplace equipment at selected site, assemble and perform operator's PMCS, operate, maintain fuel accountability record, and disassemble the LHS/PLS Modular Fuel Farm without damage to equipment, injury to personnel, or pollution of environment.

### Performance Steps

NOTE: In this task, as with any task involving extensive handling of petroleum products, make sure that the proper equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements of the task before performing it to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take the steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor. Handle/dispose of hazardous material according to SOPs/operations order (OPORD), local regulations, and/or Host Nation (HN) laws.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Read and understand unit or installation standing operating procedure SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
3. Wear appropriate PPE as required.

### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

4. Perform before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.

## Performance Steps

5. Enter communications nets and conduct communications checks according to unit TSOP.
6. Position LMFF.
  - a. Assist placement of LMFF by providing guidance in positioning containers, fuel tank modular, or pump modular.
  - b. Ground LMFF.
  - c. Connect grounding cable from first tank and pump module to grounding rod between each.
  - d. Remove valves from tank modular system.
  - e. Remove fire extinguisher from pump and tank modules. Place fire extinguishers approximately five feet from rear and center of each module.
7. Assemble LMFF.
  - a. Connect evacuation hose to the closest tank module bottom loading receptacle.
  - b. Remove Tee adapters, Butterfly adapters, and Female-to-Female couplers fittings and lay them in position for hookup, starting with the pump module and working their way back to the last tank module.
  - c. Remove 4-inch x 15-foot suction hose and lay them in position for hookup, starting with the pump module and working their way back to the last module.
  - d. Connect hoses and fittings from pump module to tank modules.
    - (1) Connect two each, 4-inch x 15-foot hoses to the pump module suction port.
    - (2) Connect hose to Tee adapter.
    - (3) Connect MALE-to-FEMALE Butterfly adapter to drain valve on tank module.
    - (4) Connect one each, 4-inch x 15-foot hose to Butterfly adapter.
    - (5) Connect Female-to-Female coupling to Tee adapter.
    - (6) Connect 4-inch x 15-foot hose to Female-to-Female coupling.
    - (7) Connect Female-to-Female Butterfly adapter to Tee adapter.
    - (8) Connect male end of 4-inch x 15-foot hose to Female Butterfly adapter.
    - (9) Connect female end of hose to Tee adapter.
    - (10) Connect Female-to-Female coupling to male Tee adapter towards tank module.
    - (11) Connect Female-to-Male Butterfly adapter to drain valve on the tank module.
    - (12) Connect one each, 4-inch x 15-foot to male end on Butterfly adapter.
    - (13) Connect 4-inch x 15-foot hose to Female-to-Female coupling.
    - (14) Connect Female-to-Female Butterfly adapter to Tee adapter.
    - (15) Connect male end of 4-inch x 15-foot hose to female Butterfly adapter.
    - (16) Connect female end of hose to Tee adapter.
    - (17) Connect Female-to-Female coupling to male Tee adapter towards tank module.
    - (18) Connect Female-to-Male Butterfly adapter to drain valve on the tank module.
    - (19) Connect one each, 4-inch x 15-foot hose to male end on butterfly adapter.
    - (20) Connect 4-inch x 15-foot hose to Female-to-Female coupling.
    - (21) Connect Female-to-Female Butterfly adapter to Tee adapter.
      - (a) Download equipment from storage area on pump module.
      - (b) Place one each drip pan under each Tee connections in hose lines from tank modules to pump module.
      - (c) Lay out fuel discharge system (HTARS) from the pump module to the distributing points.
    - (22) Place two each, 3-inch x 50-foot discharge hoses next to discharge ports on pump module. Unroll each hose separating hoses approximately 25 feet from each other at end.
    - (23) Place Tee connector at end of each 3-inch x 50-foot discharge hose.
    - (24) Place two each, 2-inch x 50-foot discharge hose to Tee connector of each 3-inch x 50-foot discharge hose and unroll one for distributing point and one for continuing points.
    - (25) Place one each Tee connector on ground next to 2-inch x 50-foot discharge.  
(NOTE: T-connector for both lines running right and left.)
    - (26) Place two each, 2-inch x 50-foot discharge hose on ground next to Tee connector (right/left side) unroll one 2-inch x 50-foot discharge hose outward towards distributing point and one for continuing distributing points.



**Performance Steps**

- (27) Place one each Tee connector next to 2-inch x 50-foot discharge hose.  
(NOTE: T-connector for both lines running right and left.)
- (28) Place two each, 2-inch x 50-foot discharge hose next to Tee connector. Unroll one 2-inch x 50-foot discharge hose outward towards distributing point and one for continuing distributing points.
- (29) Place one each elbow connector on ground next to 2-inch x 50-foot discharge hose.  
(NOTE: Elbow connector for both lines running right and left.)
- (30) Place one each, 2-inch x 50-foot discharge hose next to elbow connector. Unroll 2-inch x 50-foot discharge hose outward towards distributing point.
- (31) Place grounding rod at each distributing point.
- (32) Place fire extinguisher at each distributing point.
- (33) Place 5-gallon water containers at each distributing point.
- (34) Place drip pans at each distributing point and all connections of discharge hose line.
  - (a) Connect 3-inch x 50-foot discharge hose to pump module discharge port.  
(NOTE: Leave ball valves on both pump module and hose closed.)
  - (b) Remove dust caps from both 3-inch x 50-foot discharge hose and Tee connector. Connect and lock Tee connector with 3-inch x 50-foot discharge hose.  
(NOTE: To lock connection, open T-connector valve and keep discharge hose valve closed.)
  - (c) Remove dust caps from both 2-inch x 50-foot discharge hoses and Tee connector. Connect and lock Tee connector with both 2-inch x 50-foot discharge hoses.  
(NOTE: To lock connection, open T-connector valve and keep discharge hose valve closed.)
  - (d) Remove dust caps from both 2-inch x 50-foot discharge hoses and Tee connector.  
(NOTE: To lock connection, open T-connector valve and keep discharge hose valve closed.)
  - (e) Remove dust cap from both 2-inch x 50-foot discharge hoses and elbow connector. Connect and lock elbow connector with both 2-inch x 50-foot discharge hoses.  
(NOTE: To lock connection, open elbow connector valve and keep discharge hose valve closed.)
  - (f) Remove dust caps from 2-inch x 50-foot discharge hose and fuel nozzle. Connect and lock hose and nozzle. (NOTE: To lock connection, open nozzle valve and keep discharge hose valve closed.)
  - (g) Drive in grounding rod according to FM 10-67-1. Attach grounding cable from nozzle to grounding rod for each distributing point.
  - (h) Remove dust caps from 2-inch x 50-foot discharge hose and fuel nozzle. Connect and lock hose and nozzle. This will be done in the same steps with each distributing point. (NOTE: To lock connection, open nozzle valve and keep discharge valve closed.)
- (35) Connect fuel discharge system (HTARS) from the pump module to the distributing points (left side of distributing points).
- (36) Connect fuel discharge system (HTARS) from the pump module to the distributing points (right side of distributing points).
  - (a) Connect 3-inch x 50-foot discharge hose to pump module discharge port.  
(NOTE: Leave ball valves on both pump module and hose closed.)
  - (b) Remove dust caps from 3-inch x 50-foot discharge hose and Tee connector. Connect and lock Tee connector with 3-inch x 50-foot discharge hose.  
(NOTE: To lock connection, open T-connector valve and keep discharge hose valve closed.)
  - (c) Remove dust caps from both 2-inch x 50-foot discharge hoses and Tee connector. Connect and lock Tee connector with both 2-inch x 50-foot discharge hoses.  
(NOTE: To lock connection, open T-connector valve and keep discharge hose valve closed.)

**Performance Steps**

- (d) Remove dust caps from both 2-inch x 50-foot discharge hoses and Tee connector. Connect and lock Tee connector with both 2-inch x 50-foot discharge hoses. (NOTE: To lock connection, open T-connector valve and keep discharge hose valve closed.)
  - (e) Remove dust caps from both 2-inch x 50-foot discharge hoses and elbow connector. Connect and lock elbow connector with both 2-inch x 50-foot discharge hoses. (NOTE: To lock connection, open elbow connector valve and keep discharge hose valve closed.)
  - (f) Remove dust caps from 2-inch x 50-foot discharge hose and fuel nozzle. Connect and lock hose and nozzle. (NOTE: To lock connection, open nozzle valve and keep discharge hose valve closed.)
  - (g) Drive in grounding rod according to FM 10-67-1. Attach grounding cable from nozzle to grounding rod. (NOTE: These steps will apply to each distributing point.)
  - (h) Remove dust caps from 2-inch x 50-foot discharge hose and fuel nozzle. Connect and lock hose and nozzle. (NOTE: To lock connection, open nozzle valve and keep discharge hose valve closed.) These steps will apply to each distributing point.
  - (i) Place drip pans in designated location for distributing fuel. (NOTE: Location of nozzles and all connections of discharge hose line.)
- (37) Open hose line valves to Tee connection. Purge system for three point (left and right) duplicating each steps/procedures.
- (a) Open 2-inch valves on hose line. Walk to next Tee connection checking for any leaks.
  - (b) Open 2-inch valves to Tee connectors. Open 2-inch hose line valve going to distributing point. Open valve on nozzle. Check for any leaks.
  - (c) Open 2-inch hose line valve going to next Tee connection. Walk to next Tee connection and check for any leaks. Open hose line valve to Tee connection. Open hose line valve going to distributing point and check for any leaks. Open valve on nozzle and check for any leaks.
  - (d) Repeat steps/procedures for remaining distributing points.
  - (e) During fuel discharge operations, observe fuel tank gauge to ensure tank does not run dry. Open TANK FILL valve and allow tank to fill, then close valve.
  - (f) Once fuel discharge operations are no longer required, perform pump module shutdown procedures.

NOTE: Observe pump pressure gauge during pumping operations. Observe location of three emergency shutdown switches in case of an emergency.

- (g) Check the filter separator for water and pressure differential.
- (h) Clean up any spill immediately.

**8. Operate LMFF.**

- a. Perform before-operations PMCS on pump module unit using TM 10-4930-247-13& P.
- b. Pull lever on tank module to vertical position.
- c. Open inlet valve on pump module and discharge valve(s) on each Tank Module (being set up in fuel farm). Also open vents to tanks distributing fuel.
- d. Ensure that all valves on discharge pump module are closed to include the HTARS hose system. Double check each hose connection to ensure that connections are locked. Each hose connection to Tee connections should be closed, only the Tee connections valves are open. (NOTE: Each Tee connection valve to hose or nozzle should be open with hose or nozzle valves closed, this keeps the connection locked together.)
- e. Drain water from filter separator into suitable container.
- f. Clean radiator screen prior to starting engine.
- g. Check engine fuel tank gauge to ensure enough fuel for operations is available. If not, fill either manually or use refill valve.
- h. Start pump module unit.

**Performance Steps**

NOTE: At temperatures near or below freezing point, use glow plugs if necessary. This not only lowers the starting limit temperature, but provides easier starting temperatures normally not requiring a starting aid.

- i. If outside air temperature is near or below freezing, push in and turn starter switch to second position and hold for approximately one minute. Preheat will illuminate.
  - j. After approximately one minute, push in and hold oil pressure switch, then rotate starter switch to third position and release switch as soon as engine starts. Preheat light will shut off.
  - k. Once engine oil pressure builds to approximately 15 to 20 pounds, release oil pressure switch.
  - l. Observe engine oil pressure and engine oil temperature gauges during operation.
  - m. Reset fuel meter by turning knob on meter face to PRINT.
  - n. Open pump module discharge valve.
  - o. Rotate fueling control lever to RUN position.
  - p. Open ball valves to discharge lines on pump module unit. Then open ball valves on 3-inch hose line. Walk line to first Tee connection checking for any leaks.
  - q. Perform during-operations PMCS according to TM 10-4930-247-13& P.
  - r. When refuel operation is complete, close discharge valves on tanks.
  - s. Record issue on DA Form 3643 according to DA Pamphlet 710-2-1.
  - t. Perform after-operations PMCS according to TM 10-4930-247-13& P.
  - u. Record any defects on DA Form 2404 or DA Form 5988-E and report to supervisor.
9. Disassemble LMFF.
- a. Ensure evacuation hose is connected to tank module closest (evacuation tank) to pump module.
  - b. Open valves for both tank and nozzle to tank module evacuation port.
  - c. Ensure there is enough room in evacuation tank to add another 100 gallons of fuel from hoses connected to pump module.
  - d. Open educator control valve.
  - e. Evacuate distribution hoses (HTARS System).
  - f. Increase engine RPM until distribution hoses are flat.
  - g. Close discharge valves and return engine idle to normal.
  - h. Close tank discharge valves and MC valves. Vacuum breakers will open.
  - i. After hoses are evacuated, close supply valve and shut down pump engine.
  - j. Using hose reel handle, stow evacuated hose on hose reel. Disconnect and store supply and discharge hoses, handles, nozzles, and static cable after operation in reverse order of assembly.
  - k. Inspect site for spilled fuel. Collect all fuel contaminated soil, other fuel contaminated materials, and waste fuel. Dispose of them in an environmentally safe manner according to local procedures.
  - l. Report any spills according to SOPs established by the Installation Spill Contingency Plan.
10. Complete all records (DA Form 2404 or DA Form 5988-E and DA Form 3643) on LMFF operations and turn in to supervisor.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	_____	_____
2. Read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	_____	_____
3. Wore appropriate PPE as required.	_____	_____
4. Performed before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotated on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.	_____	_____

<b>Performance Measures</b>	<u><b>GO</b></u>	<u><b>NO-GO</b></u>
5. Entered communications nets and conducted communications checks according to unit TSOP.	—	—
6. Positioned LMFF.	—	—
7. Assembled LMFF.	—	—
8. Operated LMFF.	—	—
9. Disassembled LMFF.	—	—
10. Completed all records (DA Form 2404 or DA Form 5988-E and DA Form 3643) on LMFF operations and turned in to supervisor.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
 DA FORM 3643  
 DA FORM 5988-E  
 FM 10-67-1  
 TM 10-4930-247-13&P

**Related**

FM 3-100.12  
 FM 3-100.4

## Operate Force Provider Bulk Fuel Storage and Distribution Subsystem

101-92F-1504

**Conditions:** Given the requirement to perform fueling operations in a field environment. Personnel and materials required to perform task: six military occupational specialty (MOS)-qualified (92F) Soldiers to assist; risk management procedures; applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE); Force Provider Bulk Fuel Storage and Distribution Subsystem with the Forward Area Refueling Equipment (FARE) System or the Force Provider Fuel System (FPFS); fire extinguishers; spill kit/containment and clean up equipment; extra pipe and fittings for berm drains; two 10K bladders; prefabricated supports; one five-ton forklift; Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; unit standing operating procedure (SOP); oral or written operations order (OPORD); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); DA Form 5987-E (Motor Equipment Dispatch (EGA)); DA Form 3643 (Daily Issues of Petroleum Products); and full access to all reference material.

**Standards:** Layout equipment at selected site and perform operator's preventive maintenance checks and services (PMCS), operate, maintain fuel accountability record, and dismantle the Force Provider Bulk Fuel Storage and Distribution Subsystem adhering to MSDS without injury to personnel, damage to equipment, or of the environment.

### Performance Steps

#### **DANGER**

**FAILURE TO PERFORM THIS TASK MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL. IN THIS TASK, AS WITH ANY TASK INVOLVING EXTENSIVE HANDLING OF PETROLEUM PRODUCTS, MAKE SURE THAT EQUIPMENT IS ON HAND TO CONTAIN AND CLEAN UP SPILLS.**

Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements of the task before performing it to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.

### Performance Steps

3. Wear appropriate PPE as required.

#### CAUTION

Gloves, goggles, and hearing protection need to be worn when performing any fuel operations.

4. Perform before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.

5. Unload, using a forklift, and inventory FP fuel equipment.

6. Place FP equipment on site according to layout plan.

NOTE: Inspect and clear the area inside the berm of all debris and sharp objects before installing the berm liner or the collapsible tank.

NOTE: In the modified system cold weather (MSCW) configuration, the bulk fuel storage and distribution subsystem is assembled in the same way as the following steps. However, the tanks and the FPFS pump assembly are placed on 6-inch gravel pads.

7. Set up Force Provider Bulk Fuel Storage and Distribution Subsystem.

- a. Install berm liners and tanks.

- (1) Position berm liners inside berms and secure with sandbags.
- (2) Position 10,000-gallon tanks in berms. Ensure that drain valve is located at receiving side of berm.
- (3) Fold liner and bag back and dig a 2-foot x 2-foot x 8-inch hole to house drain elbow. Flip berm liner down and place two to three sandbags to support elbow. Perform same steps on bag number two.
- (4) Attach drain hose for berm liner and secure edges of berm liners with sandbags. Repeat same steps for bag number two.
- (5) Position and connect drain fitting assemblies on each of tank.

NOTE: There are two types of drain assemblies for this bag, follow the procedures in (a) or (b) for the appropriate bag.

- (a) Remove drain plugs from drain fittings. Screw in male fitting on end of drain hose into drain fitting. Attach drain control valve to other end of drain hose.
- (b) Remove drain caps from drain fitting. Connect 2-inch female elbow, then attach two 2-inch x 10-foot drain hose into elbow. Attach drain control valves to other end of drain hose. Place elbow into hole and support with sandbags as needed, ensuring that drain is the lowest part of bag.

- b. Assemble fill and discharge sides of tanks.

- (1) Position and connect the 4-inch filler female elbow to filler adapter of each tank.
- (2) Position and connect two sections of 4-inch x 10-foot suction hose to filler elbow.
- (3) Install a 4-inch gate valve to end of filler hose.
- (4) Install 4-inch female x male discharge elbows onto discharge adapter of tank.

NOTE: Ensure that the T-connection, all valves, and hose connections are kept out of dirt during installation and that the T-connection is laid on clean rock, boards, and so on to keep out of dirt and mud.

- (5) Position and connect two sections of 4-inch x 10-foot long suction hose to discharge elbow, then connect a 4-inch gate valve to end of hose.
- (6) Install a 4-inch female by 2-inch male adapter on gate valve for discharge side of tank.
- (7) Connect four sections of 2-inch x 5-foot long suction to adapter from discharge side of each tank.
- (8) Install a 2-inch butterfly valve to end of discharge hose from each tank.

**Performance Steps**

- (9) Connect both butterfly valves to T-connection fitting. Ensure that T-connection is raised off ground.

NOTE: Force Provider currently has two distribution systems in use (the standard FARE system and the Force Provider Fuel System (FPFS). The FPFS is a rack fueling system that is replacing the FARE system. Follow the procedures in step "c" for the FARE system and step "d" for the FPFS.

c. Assemble FARE system.

- (1) Position and connect one 2-inch x 5-foot long suction hose to end of T-fitting.
- (2) Position pump on level ground, at end of suction hose, with inlet port of pump facing toward fuel tanks.
- (3) Connect hose from T-connection to pump's inlet port.

NOTE: Ensure that the inlet port on the pump is facing toward the T-fitting that joins the two tanks.

- (4) Position and connect two 5-foot sections of suction hose at discharge end of pump to pump's discharge port.
- (5) Position filter separator on level ground, at end of suction hoses leading from discharge port of pump. The filter separator inlet port should be facing pump.
- (6) Drive one grounding rod/nozzle hanger at least three feet into ground, halfway between pump and filter separator. Attach grounding cable clips from grounding rod to pump and filter separator.
- (7) Connect two 2-inch x 5-foot suction hose from outlet of pump to inlet side of filter separator.
- (8) Connect one 2-inch x 5-foot suction hose to outlet side of filter separator.
- (9) Connect water detector kit adapter to suction hose.
- (10) Connect y fitting to other end of water detector kit adapter.
- (11) Connect 2-inch x 50-foot discharge hose assemblies to open ends of Y-fitting and lay them out to two fueling sites.
- (12) Lay out one 2-inch female coupler x 1 1/2 -inch male coupler adapter and 1 1/2-inch nozzle at each of fueling points.
- (13) Connect one 2-inch female coupler x 1 1/2-inch male coupler adapter and 1 1/2-inch nozzle at each of fueling points.

**CAUTION**

Maintain a minimum space of 25 feet between fueling points.

- (14) Walk about ten feet back toward the Y-fitting, drive a grounding rod/nozzle hanger at least three feet into ground and hang nozzle on hanger, repeat for other point.
  - (15) Attach grounding cable to grounding rod and to nozzle at each of two fueling points.
- d. Assemble FPFS.

**WARNING**

**Four personnel are required to lift the pumping assembly. Failure to observe this warning may result in injury to personnel.**

- (1) Position pump assembly where indicated by staking. This should be no more than 20 feet from fuel source.
- (2) Install a 2-inch elbow onto a 4-inch x 2-inch reducer.
- (3) Lay out and connect two 2-inch x 10-foot discharge hoses onto a 2-inch elbow.
- (4) Install 2-inch fuel distribution Tee with butterfly valves attached onto end of discharge hose.
- (5) Lay out and connect two 2-inch x 10-foot discharge hoses to T-connection fitting.

### Performance Steps

- (6) Connect other end to FPFS fuel pump inlet port.

#### **WARNING**

**Extreme care must be taken to prevent injury to fingers or hands when driving ground rods. Do not position hands between ram and drive color. Gloves should be worn. To avoid possible spark between the items and ground rod, ensure all connections are tight. Failure to do so may cause severe injury or death to personnel resulting from explosion caused by static electric discharge.**

- (7) Install ground rod at least three feet into the earth and no more than three feet from FPFS pump assembly.

#### **CAUTION**

Maintain a minimum space of 25 feet between fueling points.

- (8) Drive grounding rods/nozzle stands into earth approximately 40 feet away from FPFS.
  - (9) Unwind fuel hoses from reel and install fuel nozzles.
  - (10) Place nozzles on stands.
  - (11) Reel out ground cable and clamp cables to nozzle stands until needed.
- e. Prepare fueling sites.
- (1) Position a fire extinguisher, drip pan with absorbent material, and a 5-gallon water can at each fuel point.
  - (2) Inspect 10,000-gallon tanks for holes, tears, or cuts to fabric of tank and for leaks or deterioration.
  - (3) Place poles that stand six feet tall on both sides of fuel tank and tie a string between two poles to mark maximum amount of fuel that the tank should be filled safely according to TM 10-5430-210-12 (four feet).
  - (4) Check valves and fittings for broken handles and broken hand wheels and check Y-fittings and T-fitting for proper connection and evidence of leakage.
  - (5) Check suction and discharge hoses for cuts, dry rot, blistering, and damaged clamps.
  - (6) Check fuel nozzles for presence and condition of dust plugs, ensure grounding cables are in place and check cleanliness of strainer.
  - (7) Check fire extinguishers for condition and date of inspection/fill.
  - (8) Perform before-, during-, and after-operations PMCS according to TM 10-5430-210-12, TM 10-4930-229-12&P, and TM 10-5419-206-13. Record any defects on DA Form 2404 or DA Form 5988-E and report to your supervisor.
8. Receive bulk fuel.
- a. Check valves and fittings for broken handles and broken wheels. Check all fittings for proper connection and evidence of leakage.
  - b. Check suction and discharge hoses for cuts, dry rot, blistering, and damaged clamps.
  - c. Check fuel nozzles for presence and condition of dust plugs. Ensure grounding cables are in place and check cleanliness of strainer.
  - d. Guide bulk fuel supply vehicle to fill side of 10,000-gallon tank.
  - e. Connect suction hose on fill side to discharge hose on truck and request that delivery driver open discharge valve once connection is secure.
  - f. Open gate valve on fill side of storage tank, allowing fuel to flow from truck to storage tank.
  - g. Close gate valve on fill side of tank before top of tank touches string.
  - h. Close discharge valve and cap discharge hose on delivery vehicle without spilling any fuel.



**Performance Steps**

- i. Cap fill hose and reopen fill side gate valve to permit any fuel left in fill hose to flow into tank.
- j. Walk hose toward fill side gate valve to force any fuel into storage tank.
- k. Repeat steps for other 10,000-gallon tank.

9. Prepare bulk fuel storage and distribution subsystem for operation.

NOTE: Follow the procedures in step "a" for the FARE system and step "b" for the FPFS.

a. Prepare FARE system.

- (1) Ensure pump is primed, if not, remove priming plug from top of pump, fill pump with fuel, and replace priming plug, only when required.
- (2) Open filter separator air vent valve by pushing it down until it locks in place and close water drain valve by turning hand wheel to right on filter separator.
- (3) Open gate valve on discharge end of one bulk fuel tank and open butterfly valve at T-fitting.
- (4) Start pump engine and select appropriate speed based on fuel lift.

NOTE: Run pump engine at idle speed to lift the fuel two feet or less. Run the engine above idle speed but less than full throttle to lift the fuel two to five feet. Run the pump at full throttle to lift the fuel five feet or more.

- (5) Reduce engine speed upon hearing the pump engine slow down (engine has reached full prime) so the filter separator can fill slowly.
- (6) Close the air vent valve on filter separator at the first site of fuel and then check the pressure gauge.

NOTE: Check the pressure gauge for the following.

GREEN: 0 to 20 psi - CLEAN

YELLOW: 20 to 35 psi - CHANGE AT END OF OPERATION

RED: 35 psi AND ABOVE - CHANGE AT ONCE

- (7) Take fuel samples from each nozzle to test for contamination as soon as the system is full of fuel.

b. Prepare the FPFS.

- (1) Connect the FPFS pump assembly power cord to the nearest PDISE-M100.
- (2) Momentarily turn on the pump power switch to verify proper rotation of pump.
- (3) Prime pump by opening the priming port and filling the pump with fuel.
- (4) Place the supply valves in the open position.
- (5) Open the gate valve on the discharge end of one bulk fuel tank and open the butterfly valve at the T-fitting.
- (6) Check all fuel lines and connections for fuel leaks. Tighten connections as necessary.
- (7) Turn on the pump power switch.
- (8) Open the vent located on top of each filter.
- (9) Allow the air to vent fully. Close vent when fuel begins to flow from the vent.
- (10) Place nozzle into approved fuel container and let air escape from fuel line. When fuel begins to flow from the nozzle, release the handgrip to shut it off.
- (11) Take fuel samples from each nozzle to test for contamination as soon as the system is full of fuel.

10. Dispense fuel.

NOTE: The procedures for dispensing fuel are basically the same for both the FARE system and the FPFS.

- a. Position spill container under fill port of each vehicle being refueled and fire extinguisher within easy reach of fueling operation.
- b. Ground vehicle with grounding clip from nozzle hanger.
- c. Remove dust cap from the fuel nozzle and the receptacle cap from customer vehicle.
- d. Insert the nozzle into the filler port of vehicle maintaining metal to metal contact between the nozzle and the fuel receptacle during the entire time of fueling.
- e. Signal the pump operator to turn on the power switch and then squeeze the nozzle trigger to fill vehicle until almost full. For the FARE system, the pump operator increases the pump's engine speed to full throttle.

**Performance Steps**

- f. Release the trigger, signal the pump operator to turn off the power switch, and remove the nozzle. For the FARE system, the pump operator decreases the engine speed to idle before shutting the engine pump.
- g. Reinstall the dust cap on the nozzle and filler cap on the vehicle.
- h. Replace the nozzle on grounding rod and move the fire extinguisher and spill containers to their original position.
- i. Remove the grounding clip from the vehicle and clamp back to the nozzle stand.
- j. Ensure appropriate entries are made to DA Form 3643 according to FM 10-67-1, Chapter 3.
- k. Clean up and dispose of any fuel according to spill contingency plan.

11. Dismantle the Force Provider Bulk Fuel Storage and Distribution Subsystem.

NOTE: Follow the procedures in step "a" for the FARE system and step "b" for the FPFS.

- a. Dismantle the FARE system.
  - (1) Shut down the pump engine.
  - (2) Close the discharge end gate valves at each fuel tank and the butterfly valves at the T-fitting.
  - (3) Squeeze the filler nozzle into the spill container to drain fuel.
  - (4) Position the filter separator so the water drain valve is over the spill container.

**WARNING**

**Steady the filter separator during the draining process to avoid fuel spills and damage to equipment or injury to personnel. Leave grounding cables connected to both grounding rods and grounded components as long as possible to avoid injury due to electrical shock.**

- (5) Open the air vent valve of the filter separator and the water drain valve by turning the hand wheel to the left. Drain separator. Once drained, close drain valve.
- (6) Position the filter separator so that the outlet port is over the spill container.
- (7) Disconnect the suction hose from the filter separator outlet and caps the hose ends and the outlet port.
- (8) Reposition the separator so that the inlet port is over the container, then disconnect the hose from the inlet port and cap the hose.
- (9) Ensure that the separator is drained and plug the inlet port, close the air vent valve and set the separator back onto the ground. Disconnect the grounding cable.
- (10) Place the spill container under the Y-fitting. Disconnect the right discharge hose from the Y-fitting and cap the fitting.
- (11) Hold the open end of the discharge hose inside the spill container. Remove grounding cable and rod from filler nozzle.
- (12) Remove the filler nozzles from the end of the disconnected discharge hose over pail/spill container.

NOTE: Ensure Soldiers only remove nozzles from discharge hoses after they have been disconnected from the Y-fitting and the disconnected end of the hose from the Y-fitting is placed over a spill container.

- (13) Stretch hose to its full length and lift the nozzle end of the hose at least shoulder high. Walk the fuel hose towards the Y-fitting and drain fuel into spill container.
- (14) Cap the male end of the hose and use it as a reel for rolling the hose, starting at the male end. Lay the hoses on the ground and cap the female end.
- (15) Remove the cap from the Y-fitting and hold the Y-fitting in the spill container.
- (16) Repeat steps (10) through (15) to dismantle the left discharge hose ensuring that the female end of the hose is over drip pan while they roll the hose.
- (17) Raise the suction hoses, remove the caps and drains the hoses.

**Performance Steps**

- (18) Disconnect the Y-fitting and water adapter from the suction hose and cap/plug the Y-fitting and cap end of the suction hose.
  - (19) Place spill container under the T-connection and the 2-inch suction hose. Disconnect suction hose at the T-fitting.
  - (20) Tilt the pump towards the fitting, draining the fuel from pump and hose.
  - (21) Disconnect the suction hose from the pump inlet and cap the hose and inlet port. Cap hoses between pump and T-fitting.
  - (22) Place spill container under the 2-inch suction hose at the outlet/discharge side of pump and remove cap and drain the hose.
  - (23) Tilt the pump towards the spill container, draining the fuel from pump and hose.
  - (24) Disconnect the suction hose from the pump outlet and raise the suction hose to drain it. Cap both ends of the hose and remove grounding cable and rod.
  - (25) Place the spill container under the fitting between the 2-inch x 4-inch reducer of each tank and disconnect the reducer from the gate valves.
  - (26) Hold the open end of the suction hose in the spill container, raising the reducer and hose to shoulder height from tank number 2 and remove butterfly valve.
  - (27) Walk the hose toward the spill container and disconnect hoses and cap all ends.
- b. Dismantle the FPFS.
- (1) Stop fueling operations.

**WARNING**

**Some fuel spillage may occur whenever couplings are opened. Be prepared to collect residual fuel from hose with a pail and rags. Failure to observe this warning may result in environmental and equipment contamination, as well as potential fire hazard.**

- (2) Close the discharge end gate valves at each fuel tank and the butterfly valves at the T-fitting.
  - (3) Squeeze the filler nozzle into the spill container to drain fuel.
  - (4) Prepare pump assembly for storage or shipment as follows:
    - (a) Turn off the power switch.
    - (b) Disconnect pump assembly power cord from power source.
    - (c) Disconnect fuel feeder hose from pump assembly and drain fuel in hose into proper fuel container.
    - (d) Open vent on top of filters.
    - (e) Place a container under the drain valve of each filter and open the drain valve.
    - (f) Disconnect nozzles from distribution hoses and walk hoses to the filter to drain them.
    - (g) Reel the fuel distribution hoses back onto the reel.
    - (h) Open priming port and place a container under the pump drain valve.
    - (i) Open pump drain valve.
    - (j) Reel grounding cables back onto the cable reel and recover ground rod.
    - (k) Disconnect the 2-inch fuel hoses.
    - (l) Disconnect fuel distribution Tee and 2-inch angle valves.
    - (m) Place components, including fire extinguishers, into pump assembly equipment tray.
    - (n) Place cover over pump assembly.
12. Dismantle tanks.
- a. Raise the gate valve, from tank number two, shoulder high and remove the valve.
  - b. Walk the hose toward the tank discharge elbow to permit any residual fuel in the 4-inch hoses to drain into the tank.
  - c. Disconnect the elbow from the tank and cap it, disconnect hoses and cap them.
  - d. Remove and cap the safety/air vent valve.

**Performance Steps**

- e. Disconnect the fill elbow and hold hose shoulder high.
- f. Walk the hose twice, then close gate valve and disconnect from the black hose.
- g. Repeat steps on tank number one and then follow the same procedures to remove the fill side valves, hoses, and elbows.

**WARNING**

**Do not use the fuel collected in the spill container until it has been sampled, tested, and found to be usable.**

- 13. Perform after-operations PMCS according to TM 10-5419-206-13 and TM 10-4930-229-12&P.
  - a. Record any defects on DA Form 2404 or DA Form 5988-E.
  - b. Report any defects to the supervisor.
- 14. Fold the 10,000-gallon tanks.
- 15. Clean components of fuel and residue, as required, using the berm liners to contain any contaminated water as HW.
- 16. Clean and fold the berm liners as required.
- 17. Dispose of contaminated fuel according to spill contingency plan.
- 18. Filling 500-gallon collapsible fuel drums.

NOTE: The TQG does not actually run directly off of the 500-gallon collapsible fabric drums, but rather use the drums to refill their own internal tank when the level falls too low.

- a. Use towing yoke and an appropriate vehicle transport drum to bulk diesel facility in accordance with TM 10-8110-210-14&P.
- b. Ensure pumping assembly is not operating and gate valves on discharge side of tanks are closed.
- c. Position nozzle over a barrel or pail, squeeze nozzle handle, and walk out hose from filter separator to nozzle.
- d. Remove nozzle from discharge hose of either bulk diesel branch leg, using care to collect any spillage from hose.
- e. Immediately install pressure control and short hose onto hose.
- f. Connect short hose to coupling on drum. Open hand wheel on drum.
- g. Open valves.
- h. Start pumping assembly in accordance with TM 10-4930-238-12&P.
- i. Fill drum in accordance with TM 10-8110-201-14&P.
- j. When fueling is complete, stop pumping assembly in accordance with TM 10-4930-238-12&P.
- k. Close hand wheel.
- l. Disconnect short hose from drum, using care to collect any residual from hose.
- m. Transport filled drum in accordance with TM 10-8110-210-14&P.
- n. Power generation personnel shall position filled fuel drum back in service in accordance with TM 10-5419-206-13.
- o. Remove pressure control and short hose from hose and immediately install nozzle onto hose. Be prepared to catch any fuel leakage that may occur. Annotate information on the proper fuel accountability forms.
- p. Annotate information on the proper fuel accountability forms and report to supervisor.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
3. Wore appropriate PPE as required.	—	—
4. Performed before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotated on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.	—	—
5. Unloaded and inventoried the FP fuel equipment using a fork lift.	—	—
6. Placed the FP equipment on site according to layout plan.	—	—
7. Set up the Force Provider Bulk Fuel Storage and Distribution Subsystem (using the FARE system or FPFS).	—	—
8. Received bulk fuel.	—	—
9. Prepared the bulk fuel storage and distribution subsystem for operation (using the FARE system or FPFS).	—	—
10. Dispensed fuel (using the FARE System or FPFS).	—	—
11. Dismantled the Force Provider Bulk Fuel Storage and Distribution System (FARE System of FPFS).	—	—
12. Dismantled tanks.	—	—
13. Performed PMCS on the Force Provider equipment.	—	—
14. Folded the 10,000-gallon tanks.	—	—
15. Cleaned components of fuel and residue as required.	—	—
16. Cleaned and folded the berm liners as required.	—	—
17. Disposed of contaminated fuel according to Spill Contingency Plan.	—	—
18. Filled 500-gallon fuel drums as required.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

### References

#### Required

DA FORM 2404  
 DA FORM 3643  
 DA FORM 5987-E  
 DA FORM 5988-E  
 TM 10-4930-229-12&P  
 TM 10-4930-238-12&P  
 TM 10-8110-201-14&P

#### Related

FM 10-67-1  
 FM 3-100.12  
 FM 3-100.4

**Operate Tactical Petroleum Terminal (TPT)****101-92F-1505**

**Conditions:** Given the requirement to assemble and operate a Tactical Petroleum Terminal (TPT) system in a field environment. Personnel and materials required to perform task: forty-three military occupational specialty (MOS)-qualified (92F) Soldiers to assist TPT (consisting of three Tank Farm Assemblies); two 5,000 barrel fabric tanks each; a Tanker-Truck Receipt Manifold; a Fuel Dispensing Assembly; a Transfer Hose Line Assembly; six Fire Suppression Assemblies; an Optional Tank Configuration and a Fuel Unit Support Assembly; communications equipment; spill containers; tools; risk management procedures; Material Safety Data Sheets (MSDS); personal protective equipment (PPE); Facility Response Plan (FRP); unit standing operating procedure (SOP) on fueling operations; pumping orders; DA Form 1804 (Petroleum Sample), DA Form 4193 (Petroleum Products Pump Station Hourly Operations Record); DA Form 3643 (Daily Issues of Petroleum Products); DA Form 2765-1 (Request for Issue or Turn-in); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); design plan; and full access to all reference material.

**Standards:** Emplace, unpack, assemble, operate, perform fuel accountability, perform operator's preventive maintenance checks and services (PMCS), and disassemble the TPT without injury to personnel, damage to equipment, or pollution of the environment.

**Performance Steps**

NOTE: In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements of the task before performing it to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command
2. Read and understand unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
3. Wear appropriate PPE as required.

**CAUTION**

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

4. Perform before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.

**Performance Steps**

5. Enter communication nets and conduct communications checks in accordance with unit SOP and Communication Operating Procedures.
6. Position major end items such as pumps, Twin Agent Unit (TAU), and floodlights, as directed by supervisor.
  - a. Unload components of fuel unit using a forklift.
  - b. Place fuel unit tank farm equipment on site according to layout plan.
7. Place floodlight sets according to TM 9-6230-211-14 as required and as directed by supervisor.

**WARNING**

**Ground and bond equipment at time of installation to prevent explosion or fire.**

NOTE: Installation of floodlights early in the erection program is necessary to permit work at night.

**WARNING**

**Do not attempt to set up floodlight set on loose or unstable soil or on grades of more than five degrees. If the floodlight set topples over, severe damage to equipment and injury or loss of life may occur.**

- a. Place floodlight set on firm level ground with a grade of less than five degrees. Select a site that will provide a firm base and that has a grade of less than five degrees.
- b. Level floodlight set.
  - (1) Ensure that tongue stabilizing jack is supporting trailer tongue.
  - (2) Disengage jack locking pin and rotate rear stabilizing jack to vertical position. Extend jack foot so it is touching ground.
  - (3) Loosen "T" bolts on front stabilizing jack outriggers, extend outriggers fully, and tighten "T" bolt.
  - (4) Disengage jack locking pins and rotate each front stabilizing jacks to vertical position. Extend jacks until each jack foot is touching ground.
  - (5) Disengage hand brake.
  - (6) Using bulls eye level indicator mounted on trailer tongue, adjust four stabilizing jacks until floodlight set is level.
- c. Attach "T" bar to floodlight tower mast.
  - (1) Remove "T" bar from its stowed position on rear panel of floodlight set by loosening and removing two wing nuts and flat washers and lifting "T" bar from stow brackets.
  - (2) Install "T" bar at the top of lower mast assembly and secure with two flat washers, two lock washers, and two wing nuts.
- d. Install four metal halide light fixtures on tower mast assembly.
  - (1) Open both side doors and secure with attached hair pin cotter key. Doors should remain open during operation for maximum air flow.
  - (2) Remove metal halide light fixtures from stowage brackets located inside floodlight set trailer. Retain mounting hardware to attach light fixtures to "T" bar.
  - (3) Mount light fixtures on "T" bar mounting post and secure each with a flat washer, lock washer, and wing nut.
  - (4) Plug each light fixture into tower power lead assembly receptacle and twist to lock plug.

**Performance Steps**

- e. Erect tower mast assembly.
  - (1) Remove hair pin cotter key from tower lock down pin. Remove lock down pin from back tower support retain hair pin cotter key.
  - (2) Remove hair pin cotter key from upright tower locking pin and remove locking pin from tower swivel base support. Retain hair pin cotter keys.
  - (3) Turn handle of tower erecting winch clockwise until tower is fully erected. Reinsert locking pin into tower swivel base support and install hair pin cotter key.
  - (4) Plug two power leads that extend from power lead collecting tubes into tower lamp receptacles located on front, right hand side of floodlight set and twist to lock.
- f. Extend tower mast.
  - (1) Pull tower extension locking pin operating handle down to release locking pin.
  - (2) Turn handle of tower extension winch clockwise until mast is extended to desired height (30 feet maximum).
- g. Ground floodlight set.
  - (1) Loosen "T" bolt and remove ground rod from stowed position on top of set.
  - (2) Adjust ground wire as required and drive ground rod into ground.
- h. Assemble portable light mast and quartz light fixtures.
  - (1) Remove each portable mast from its stowed position on top of floodlight set trailer by removing locking pin with securing clip. Retain locking pin with clip. It will be used to lock mast in its extended position.
  - (2) Lift and twist mast to remove from trailer top.
  - (3) Loosen "T" bolt. Extend tripod legs and tighten "T" bolt.
  - (4) Remove "T" bar with attached quartz fixtures from trailer.
  - (5) Lay mast and light fixture on ground and remove bottom locking pin with securing clip. Extend mast to desired height and insert both bottom and top locking pins with securing clips.
  - (6) Place mast and light fixture in desired location and plug power lead into proper receptacle on front of floodlight set.
- i. Start up floodlight set.
  - (1) Perform before-operations PMCS according to TM 9-6230-211-14 prior to starting unit.
  - (2) Start engine according to TM 9-6230-211-14.
- j. Operate floodlight set according to TM 9-6230-211-14
  - (1) Once engine has stabilized in RPM, place main circuit breaker, CB9, in ON position.
  - (2) Observe voltage reading on A/C voltage meter located on power distribution box control panel. If voltage is between 233 and 247 volts, proceed with operations.
  - (3) Place 1,000-watt tower floodlight circuit breakers in ON position. Turn on as many as desired.
  - (4) Place 500-watt portable light circuit breakers in ON position if required.
- k. Shutdown floodlight set.

**WARNING**

**Never stop or start the generator set while still under load. Make sure all circuit breakers located in the control panel are OFF position before any attempt is made to stop or start generator set.**

- l. Place all circuit breakers located in power distribution box control panel in OFF position.

- 8. Place 5,000 barrel fabric collapsible tank.
  - a. Clear ground of brush saplings and derbies (rocks, sticks, and brush).
  - b. Place berm liner.



**Performance Steps**

- c. Deploy tank. Place shipping skid containing tank in middle of prepared pad. If pad has any slope, length of shipping skid must be parallel to slope fall line and slope should be to suction side outlet. Make sure tank is in proper position before beginning deployment, moving once it is deployed is very difficult.

NOTE: Avoid stepping on bags as you unfold them.

- d. Unroll one end of tank by pushing on roll.
- e. DO NOT unroll both ends. Wait until shipping skid has been removed and placed outside pad area.
- f. Roll remaining section off shipping skid toward unrolled section. When skid is free from under tank, remove skid and place skid outside pad area.
- g. After skid is removed, unroll remaining section of tank.
- h. Unfold tank by pulling each row of deployment straps in opposite directions. This will extend the two top folded layers.
- i. Use deployment straps and tank handles to fully unfold tank. Tank should be lying smooth with out folds.

NOTE: Tank should be centered within the tank pad with one drain assembly at the low end of the pad. Use tank handles to position tank, if necessary. To move, circle entire tank with people at every handle. Pull up on handles to get air under the tank and then move. Repeat until tank is in proper position.

- j. Fold tank back on both ends with the filler nozzles to expose drains. Install drain hose on lower end or suction side of tank and tighten it securely. Install and tighten drain plug on high side.
- k. Dig a shallow trench beyond tank edge for drain hose to lie in. This will help keep tank bottom flat.
- l. Use earth moving equipment to repair berm after tank installation is complete.
- m. Install vent assembly in center of tank.
- n. Unfold ends on tank so it is lying flat and smooth without any folds.
- o. Install components for transfer hose line and dispensing assembly of tank farm assembly.

(1) Connect hoses.

- (a) Connect 6-inch cam lock (female-by-male) elbow to nozzle on discharge (pump) side of tank keeping inlet parallel to tank edge.
- (b) First install 6-inch by 10-foot suction hoses. Keep hoses on tank and parallel to tank edge and bring hose off side of tank
- (c) Connect 6-inch female cam lock by double groove adapter to cam lock gate valve
- (d) Connect 6-inch double groove suction hose up over berm to 6-inch gate valve and tee assembly.

NOTE: DO NOT place any valves inside the berm in the event of a tank rupture. Any valve inside the berm would not be accessible.

- (e) Install discharge (pump) side of second tank.
- (f) Position hose line pump. Ensure pump is located relatively near BFTA to minimize suction hose requirements.
- (g) Connect 6-inch suction hose between inlet or suction side of pump assembly to Tee assembly.
- (h) Connect 6-inch cam lock (female-by-female) elbow to nozzle on inlet side of tank keeping elbow pointed parallel to edge of tank.
- (i) Connect 6-inch double groove male cam lock adapter to elbow.
- (j) Connect 6-inch discharge hose between coupling adapter over berm to inlet Tee assembly.

NOTE: Keeping the inlet and outlet hoses parallel to the tank edge at the tank nozzles keeps the hoses from putting strain on the tank nozzles.

(2) Installation of range poles (Figure 1).

- (a) Install range poles on top or outside of berm that berm liner will allow.
- (b) Place a plastic cord or twine between poles to help judge tank height in relation to poles.

NOTE: The center of the cord when stretched taut should be six feet, eight inches above pad floor.

**Performance Steps**

9. Set up fuel dispensing assembly (Figure 2).

NOTE: The following assembly instructions apply to one fuel dispensing assembly. There is one fuel dispensing assembly for each unit, for a total of three for a TPT.

- a. Inspect all items for damage, cleanliness, and quantities required.
- b. Determine approximate location and layout of dispensing area per established plot plan.

NOTE: Liberally apply petrolatum to the gasket and the inside surface of coupling clamp to prevent pinching during installation. Then, pull the coupling gasket over one grooved end of each mating joint. Ensure gasket is properly positioned over full circumference of sealing surfaces. Position coupling clamp over gasket while maintaining alignment of mating parts. Lock coupling clamp securely.

- c. Align mating surfaces of 6 x 6 x 4 Tees (1) (Figure 2), 6-inch x 50-foot hose assemblies (2), 6-inch ball valves (3), 6-inch pressure control valve (4), and 6-inch cap (5). Join these items using coupling clamps (6).
  - d. To assemble 4-inch dispensing hoses:
    - (1) Connect 4-inch gate valves (7), to tees (1) using couplings (8), gaskets (9), and coupling clamps (10).
    - (2) Connect 4-inch x 25-foot cam lock hoses (11) to gate valves (7).
    - (3) Connect 4-inch cam lock butterfly valve (12) to hose (11).
  - e. Determine dispensing device combination from the following and connect them to butterfly valves (12)
    - (1) Connect 4-inch male x 3-inch female cam lock reducer (13) and gasket (14).
    - (2) D-1 nozzle assembly (15) and adapter (16).
    - (3) Dry break coupling assembly (17) and dry break tanker truck adapter (18).
    - (4) NATO tank truck adapter coupling set (19).
    - (5) NATO rail tanker coupling (20).
  - f. To assemble 1 1/2-inch dispensing hoses.
    - (1) Connect 1 1/2-inch ball valves (21) to tees (1) using couplings (8) gaskets (9) coupling clamps (10) 4-inch female x 2-inch male reducers (22) and gaskets (23) and 2-inch female x 1 1/2-inch male reducers (24), and gasket (25).
    - (2) Connect 1 1/2-inch pressure control valves (26) to ball valves (21).
    - (3) Connect 1 1/2-inch x 25-foot hose assemblies (27) to pressure control valve (26)
    - (4) Connect remaining 1 1/2-inch ball valves (21) to end of hoses (27)
  - g. To assemble 4-inch filter separator and water detection kit lines.
    - (1) Connect 4-inch x 25-foot hoses (11) cam lock to Tees (1) using coupling clamps (10), gaskets (9), coupling adapters (28), and gaskets (23).
    - (2) Connect 4-inch gate valves (7) to hoses (11).
    - (3) Connect water detection kit adapter (29) to gate valve (7)
    - (4) Install, service, and prepare the filter separators (30) in accordance with TM 5-4330-211-12.
    - (5) Connect filter separators (30) to water detection kit adapters (29) using couplings (8), gaskets (9), and coupling clamps (10).
    - (6) Connect 4-inch gate valves (7) to filter separators (30) using coupling clamps (10), gaskets (9), coupling adapters (28), and gaskets (23).
    - (7) Connect 4-inch x 25-foot hoses (11) cam lock to gate valves (7).
    - (8) Connect hoses (11) to tees (1) using couplings (8), gaskets (9), and coupling clamps (10).
  - h. Locate and install ground rod (31).
  - i. Place eight each, drip pans (32), two each, oil absorbent material (33), and two each, storage drums (34) where they will be available for use when needed.
10. Assemble tanker truck receipt manifold (Figure 3).
- a. Place the four unloading points (12), (10), (9), (13), (14), (15), and (16).
  - b. Start in the center of the unloading zone by assembly of the suction manifold. Use two 6-inch tees (4) and four 6-inch gate valves (3), position the manifold far enough off the access road to allow that the 4-inch suction hoses to reach the tanker trucks.
  - c. Position and connect hose line pump. Use no more than two sections of 6-inch suction hose. This reduces suction requirements on pump.

**Performance Steps**

- d. Start at center of suction manifold, work both ways in establishing unload points. Use 6-inch suction hoses to each side.
- e. Connect 6-inch x 6-inch x 4-inch tees (1) to the 6-inch suction hoses (2) to start each unload point.
- f. Cap outside ends of outer most Tees.
- g. Using a cam lock to double groove adapter, connect a 4-inch gate valve onto each 6-inch x 6-inch x 4-inch tee followed by 4-inch suction hose (9).
- h. Connect 4-inch butter fly valves and a cam lock reducer (14).
- i. Connect a 50-foot section of 6-inch discharge hose, install bypass around hose line pump.
- j. Connect hose line between tanker truck receipt manifold and switching manifold.

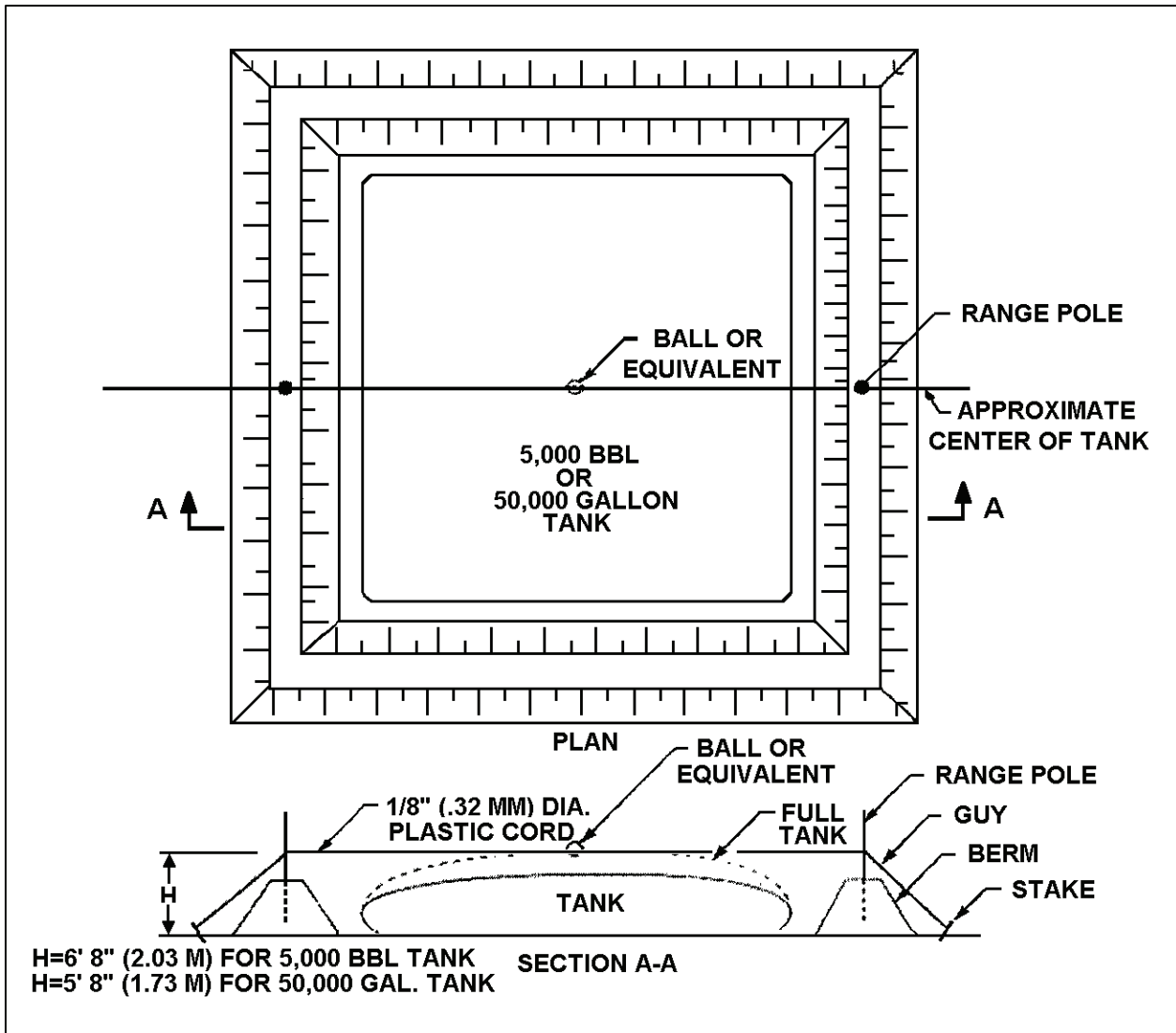


Figure 1

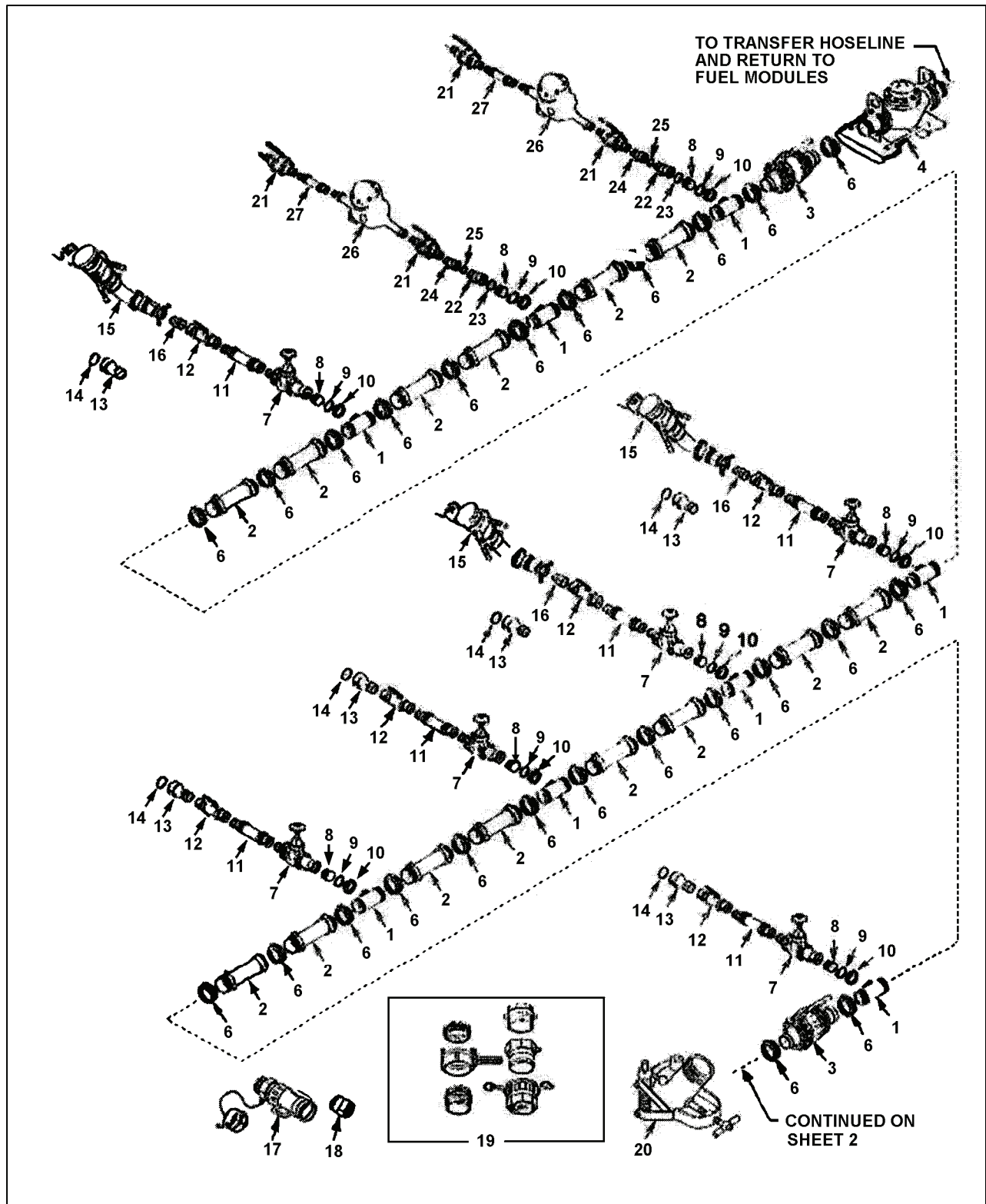


Figure 2

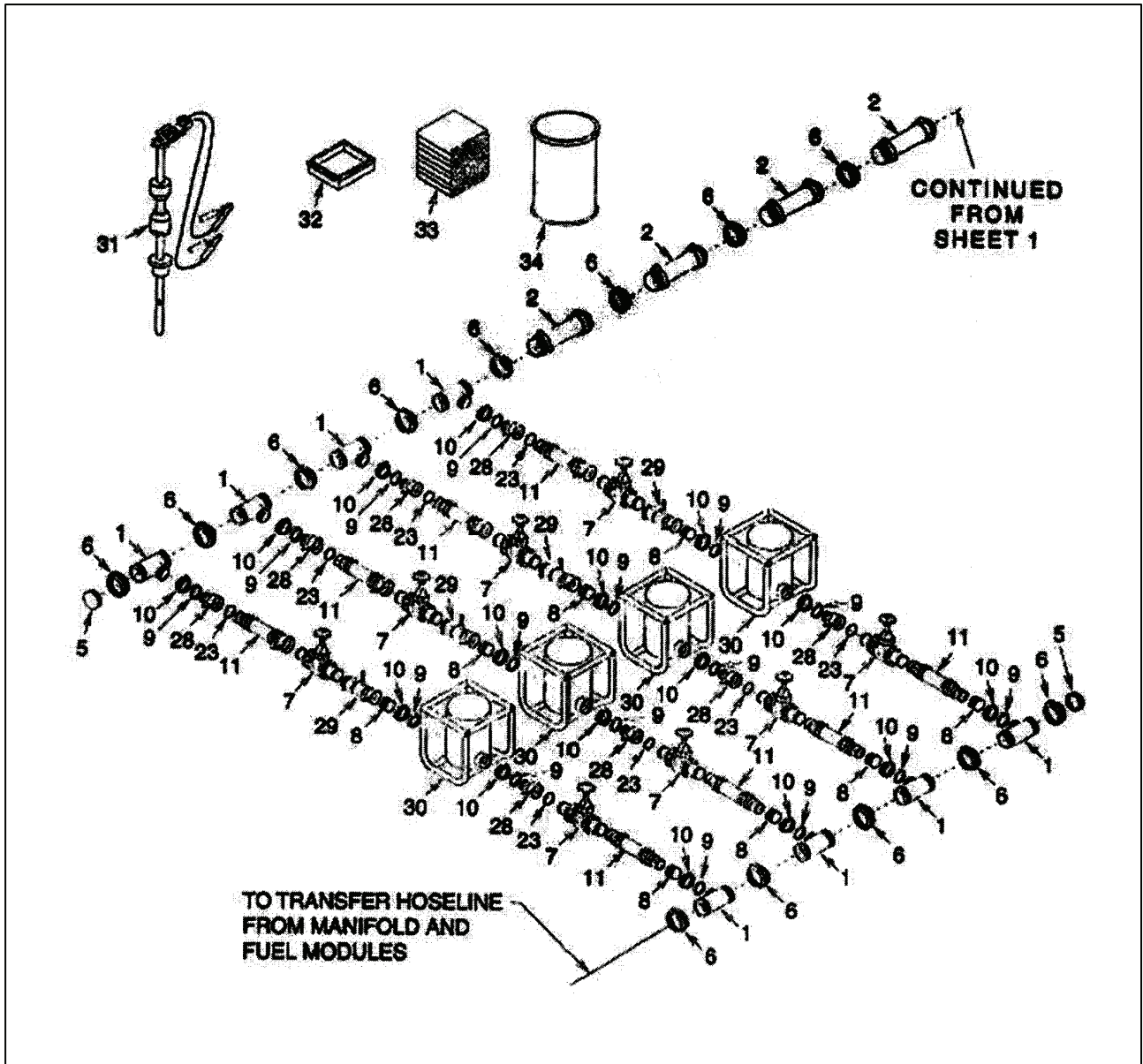


Figure 3

**Performance Steps**

11. Place switching manifold (Figure 4).
  - a. Place containers containing 6-inch aluminum tees (2), 6-inch gate valves (3), 6-inch sampling assembly (7), 6-inch ball valves (4), hose assemblies (5), meter skid assemblies (6), and pressure regulating valve assembly (8) near their respective installation sites as indicated.
  - b. Remove tees, valves, hose line, pressure regulating valve assembly, sampling assembly, meter skid assemblies, adapters, coupling clamps, and coupling gaskets from containers.
  - c. Check all items for damage, cleanliness, and quantities required.

### Performance Steps

NOTE: Liberally apply petrolatum to the gasket and the installation. Then, pull the coupling gasket over one grooved end of each mating joint. Ensure gasket is properly positioned over full circumference of sealing surfaces. Position coupling clamp over gasket. While maintaining alignment of mating parts, lock coupling clamp securely.

- d. Connect 6-inch tees (2) together to form the configuration shown using coupling clamps (1).
- e. Connect gate valves (3) and ball valve assemblies (4) to tees (2) using coupling clamps (1).
- f. Connect discharge hoses (5) between ball valves (4) and meter strainer assemblies (6). Also between tee (2) and meter strainer on return manifold using coupling clamps (1).
- g. Connect fuel sampling assembly (7) to tee (2) using coupling clamps (1). In some cases hose may be in between sampling assembly and switching manifold.
- h. Connect pressure regulating valve assembly (8) in pipeline using coupling clamps (1) to switching manifold, upstream of fuel sampling assembly, or as directed by operating authority. Six-inch IPDS single groove pipe is supplied by associated pipeline. If system does not involve an associated pipeline, feed line (hose or pipe) can be tied directly into pressure regulator (8) and all downstream conduit can be hose line.

### WARNING

**Equipment must be grounded and bonded at time of installation to prevent explosion and fire.**

### CAUTION

Equipment damage can result if down stream pressure exceeds 125 psi.

- i. On return manifold, connect discharge hose (5) between outlet side of meter strainer (6) and single to double groove adapter (9) using coupling clamps (1).
  - j. Place four each, drip pan (10), two each absorbent oil material (11), and two each storage drum (12) where they will be available for use if needed.
12. Place fire suppression equipment as directed by layout in accordance with task 101-92F-1309.
13. Set up contaminated fuel module (Figure 5).
- a. Locate and install two each, 50,000 gallon collapsible fabric tanks (1) (Figure 5). Be sure that elbows, hoses, and valves supplied with tanks are installed.

### WARNING

**GROUNDING AND BONDING pumps must be grounded at time of installation to prevent explosion or fire.**

**Performance Steps****CAUTION**

Install pump as far away from the tanks it serves without bridging the suction hose or deforming the tank top. Pump engine and exhaust fumes are hot and distance from tanks enhances safety.

- b. Prepare 350 GPM pump (2) for use as applicable. Observe all warnings and cautions.
- c. Connect two each, 6-inch x 4-inch reducers (3) to tank (1) elbows.
- d. Check that quick disconnect gaskets (4) are in place and connect two each, cam lock adapter (5).

NOTE: Liberally apply petrolatum to the gasket and the inside surface of coupling clamp to prevent pinching during installation. Then, pull the coupling gasket over one grooved end of each mating joint. Ensure gasket is properly positioned over full circumference of sealing surfaces. Position coupling clamp over gasket while maintaining alignment of mating parts, lock coupling, clamp securely.

- e. Connect four each, 6-inch x 50-foot hose assemblies (7) using coupling clamps (6).
- f. Connect two each, gate valve (8) using coupling clamps (6).
- g. Connect gate valves (8) to tee (9) using coupling clamps (6).
- h. Connect remaining 6-inch x 50-foot hose (7) to tee (9) using coupling clamp (6).
- i. Connect four each (total of eight) 4-inch x 12-foot cam lock hoses (10) from tanks (1) to suction side of pump (2).
- j. Connect two each 4-inch x 25-foot cam lock hoses (11) to discharge side of pump (2).
- k. Check that quick disconnect gasket (12) are in place and install 4-inch x 3-inch reducer (13) and 3-inch ball valve (14).
- l. Place two each drip pan (15), absorbent oil material (16), and storage drum (17) where they will be available for use if needed.

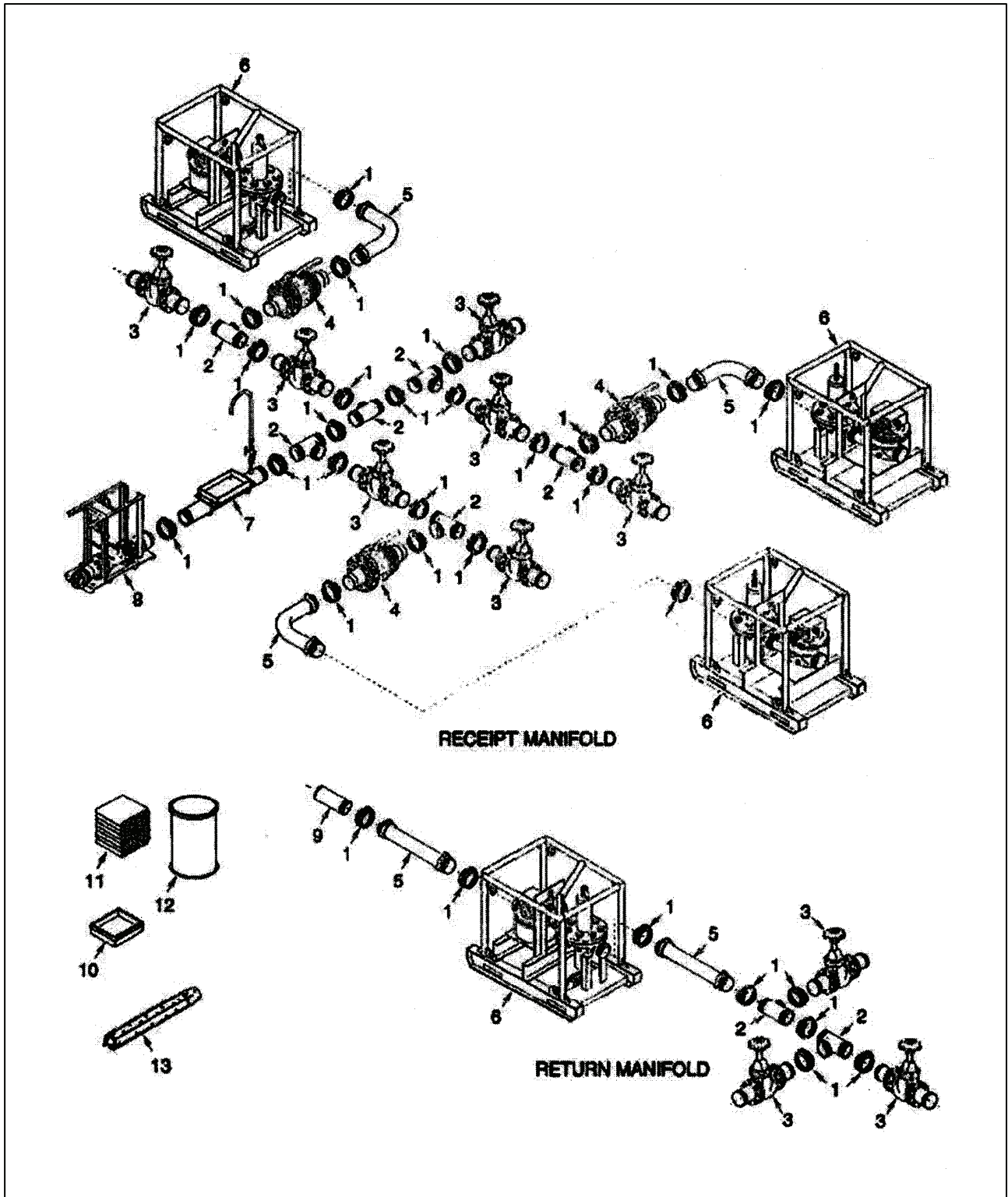


Figure 4



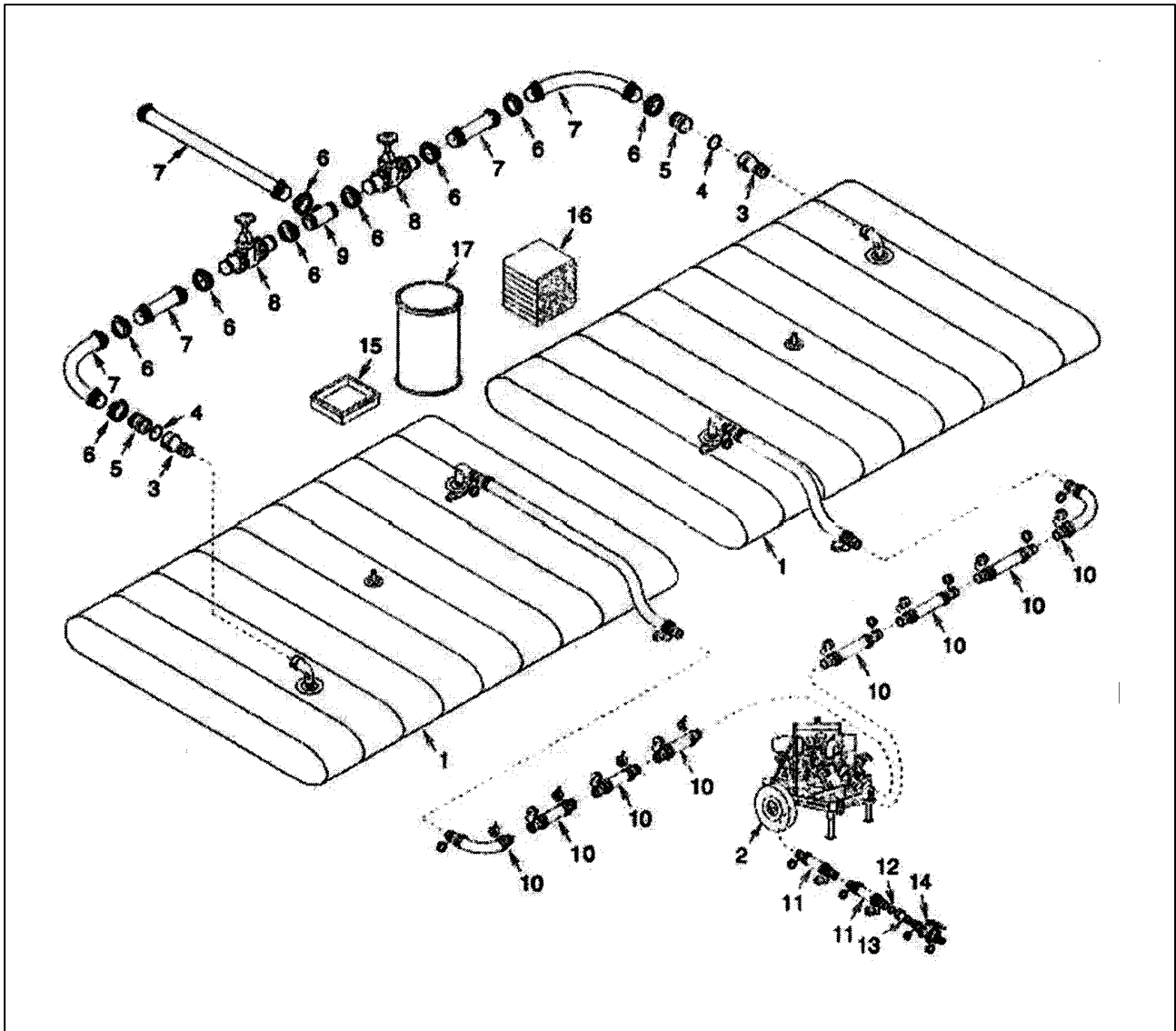


Figure 5

### Performance Steps

14. Connecting transfer hose line assembly (Figure 6).

NOTES: Connect transfer hose line assembly is used to connect the tank farm assemblies, switching manifold, fuel dispensing assemblies, and tanker truck receipt manifolds into an operational TPT.

There are four transfer hose line assemblies in a TPT (one per pipeline connection assembly and one in each of the three fuel units). Fuel from the pipeline enters the switching manifold and with proper positioning of valves, fuel is routed through transfer hose line to any fuel unit. Fuel is stored in fuel units and then transferred through the transfer hose line assembly by the 600 GPM hose line pump to the fuel dispensing assembly or back to a pipeline.

The 6-inch x 500-foot hose assemblies are supplied in shipping and storage containers

**Performance Steps**

- a. Position containers storing 6-inch tees and gate valve assemblies near their respective installation sites.
- b. Remove necessary quantities of 6-inch aluminum tees, 6-inch aluminum gate valve assemblies, coupling clamps, and coupling gaskets from containers.
- c. Check all items for damage, cleanliness, and quantities required.

NOTE: Liberally apply petrolatum to the gasket and the inside surface of coupling clamp to prevent pinching during installation. Then, pull the coupling gasket over one grooved end of each mating joint. Ensure gasket is properly positioned over full circumference of sealing surfaces. Position coupling clamp over gasket while maintaining alignment of mating parts, lock coupling, clamp securely.

- d. Tighten coupling clamps (1) to gate valves (2), being careful not to damage gasket (3).
- e. Connect gate valves (2) to tees (4).
- f. Connect transfer hose line (quantity as required) between tees (4) and receipt manifold assemblies.

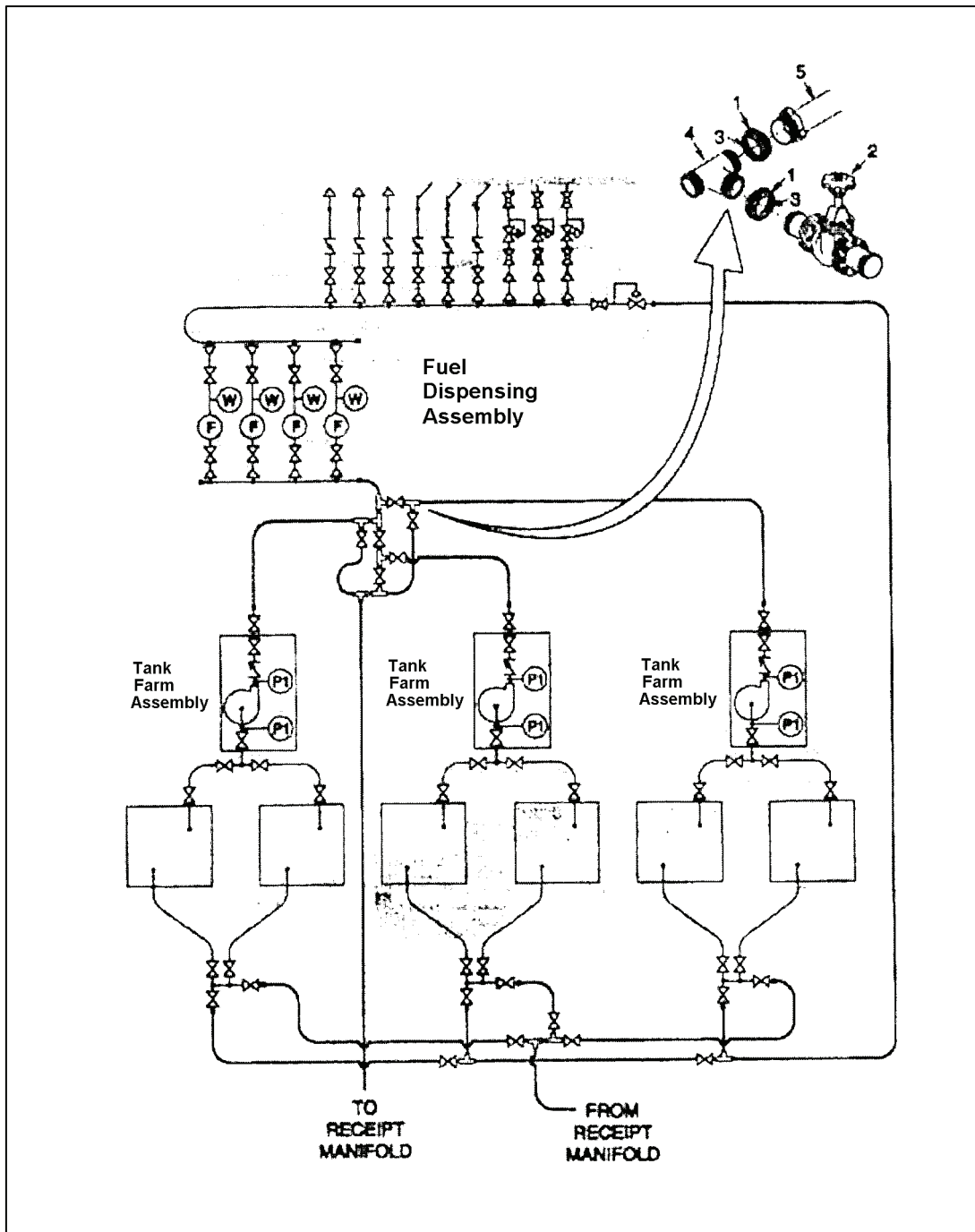


Figure 6

### Performance Steps

15. Prepare TPT for operation.
  - a. Pre-operating checks according to unit standing operating procedures (SOPs).
  - b. Perform commissioning of TPT system.

NOTE: The term commissioning is meant to include purging air and initial line filling. Commissioning is not intended to include a complete fill of the storage tanks.

**Performance Steps**

- (1) Purge system as directed by supervisor.

**CAUTION**

The vent gases during purging operations may be a flammable mixture of fuel vapors and air. Special precautions to eliminate ignition sources in the area must be taken.

NOTE: The process of removing air from the system will cause a relatively high venting rate from the tank vents. The vent gas is likely to be flammable due to mixing with fuel vapors and droplets. Special precautions must be taken due to this condition.

**CAUTION**

Internal dirt, rocks, construction waste, and so forth can ruin operating equipment and cause operating failures. Eliminate such contaminants before commencing operations.

- (2) Purge and fill fuel unit as directed.

NOTE: Each fuel unit is purged and filled using the same procedures.

- (3) Purge and fill supply hose lines to contaminated fuel module.

- (4) Purge and fill supply lines.

NOTE: Very low flow rates (approximately 50 GPM maximum) must be maintained during the purge and fill operation until air has been fully purged from the meter skid assembly and the upstream hose line. High airflow through the meter skid assembly may over speed and ruin the meter.

**CAUTION**

BLOCKED IN PRESSURE trapping high pressure between closed valves can damage equipment.

- (5) Purge and fill discharge lines from tanks.

**WARNINGS**

**FUEL SPLASH AND SPILL - Splashes and spills can cause eye injury and skin irritation. Wear face shield and approved gloves.**

**GROUNDING AND BONDING - The system dispensing valve must be grounded and bonded to the receipt vessel prior to opening the vessel and dispensing fuel. Static electricity could cause a fire or explosion.**

**Performance Steps**

- (6) Purge and fill the discharge lines of tanks, the lines to and through the fuel dispensing system and back to the tank farm (module) assemblies. In preparation for the purge and fill of the fuel dispensing assembly, bring in a collapsible or open drum or deep container to catch the fuel from the dispensing valves.

**WARNINGS**

**FUEL SPLASH AND SPILL - Splashes and spills can cause eye injury and skin irritation. Wear face shield and approved gloves.**

**HOSE WHIP - Hose may tend to move rapidly or whip if not weighed down. Pressure changes can cause hose whip and injure personnel.**

- (7) Purge discharge lines of fuel tanks.  
 (8) Perform commissioning procedures prior to operation.

16. Operate TPT.  
 a. Transfer fuel.

**WARNING**

**OVERFILLING FABRIC TANKS - Do not overfill the fabric collapsible tanks. A spill through the vent or possibly a rupture and major spill could result.**

NOTE: Check that commissioning procedures have been completed.

- (1) Divert off specification fuel to contaminated fuel module when sample results indicate interface has arrived.
- (2) Receive fuel from pipeline as follows:
- (a) Reset meter.
  - (b) Open valves in hose line route to appropriate tank.
  - (c) Open valve to appropriate meter skid assembly.
  - (d) Once transfer complete close appropriate valves take reading from meter record on DA Form 4193.
  - (e) Draw samples as required complete DA Form 1804.
- (3) Receive fuel from a tanker truck as follows:
- (a) Gauge petroleum tank vehicles according to task 101-92F-1414.
  - (b) Reset meter.
  - (c) Open valves in hose line route to appropriate tank.
  - (d) Connect supply tanker truck (or trucks) to couplings outboard of valve.
  - (e) Open appropriate valve to hose line pump (600 GPM).
  - (f) Start hose line pump and open appropriate valves to tank.

**Performance Steps**

**WARNING**

**Do not allow truck to move away without disconnecting the hose line. A spill could result.**

- (g) When transfer is complete, shut down pump and close all valves. Disconnect tanker-truck(s).
- (h) Draw samples as required complete DA Form 1804.
- (4) Discharge fuel from a tank farm (module) assembly through fuel dispensing assembly.

**WARNINGS**

**DISPENCING ASSEMBLY OPERATING PRESSURE - Make sure that pressure control valves are functioning. High pressure can result in hose whip, splash back, and spills.**

**GROUNDING AND BODING - The system dispensing valve must be grounded and bonded to the receipt vessel prior to opening the vessel and dispensing fuel. Static electricity could cause a fire or explosion.**

**NO SMOKING - Enforce no smoking rules on all personnel, including drivers from outside the TPT.**

**VEHICLE DISCONNECT - Make sure vehicles are disconnected from the dispensing assembly before moving.**

**STOP VEHICLE ENGINES - Stop all vehicle engines while loading fuel.**

- (a) Establish which fuel tank has ample room to hold incoming fuel.

NOTE: The rate of discharge through the dispensing assembly is governed by a 6-inch pressure control valve which is set at 30 psi and is located in the recirculating line of the dispensing set. It is intended that the control valve keep the dispensing pressures at a maximum of 30 psi. There must be good communications between the dispensing operating supervisor and the pump operator.

- (b) Shut down feed pump when no fuel is to be dispensed.
- (c) The following describes use of pump (3) to discharge fuel from tank (1) through dispensing assembly and recirculate to tank (2).
  1. Open valves (4) through (21). Check that there is a flow path open from pressure regulating valve (22) to a tank.
  2. Connect dispensing coupling (or couplings) to tanker truck(s) being loaded.
  3. Start pump (3) and hold at a very low discharge pressure or in idle position.
  4. Open appropriate valve(s) (23) through (30) leading to dispensing hose coupling(s) being used.
  5. Raise pump (3) discharge pressure as required to maintain 30 psi at control valve (22). Under no conditions should the pump discharge pressure be allowed to exceed 75 psi. Surplus fuel (for example, that is not dispensed), will flow to tank (2).
  6. When loading is complete, close valve nearest coupling(s) (23) through (30).
  7. Shut down pump (3). Disconnect coupling(s).

**Performance Steps**

8. The above instructions pass fuel through filter separators (31) through (34). Under normal conditions three filter separators should be in service and loading rates limited to 700 GPM.
- (5) Transfer fuel from a tank farm (module) assembly to associated pipeline system. Select to transfer fuel from the TPT to the associated pipeline, there must be no back pressure in pipeline system that exceeds the 600 GPM hose line pump's discharge head capability.

NOTE: The routing and procedures to transfer from any other tank would be the same except for the valve positions between the tank and the pump.

- (a) Open valves (1), (2), (3), (4), (5), and (6).
- (b) Record reading or reset meter (7).
- (c) Start and operate pump (8) at low discharge pressure.
- (d) Open valve (9) while increasing the discharge rate on pump (8).

**CAUTION**

BACK FLOW - Make sure there is no flow from pipeline system into the TPT to prevent overpressure.

- (e) When transfer is complete, close valve (9) and promptly shut down pump (8).
- (f) Record meter (7) reading.

**CAUTION**

Trapping high pressure between closed valves can damage equipment.

- (g) Close all valves beginning at furthest upstream point and continuing downstream.
- (6) Depressurizing and Draining System. After TPT is commissioned and placed in operation, it will be necessary from time to time to depressurize and drain various parts of system for maintenance or disassembly. Throughout operating and maintenance instructions of manual, reader is warned to depressurize system before breaking (opening) flanges, couplings, and other closures. This is to avoid spills or sprays of fuel that can injure personnel or cause a fire hazard. The following describes procedures recommended for depressurization and draining.

**WARNING**

**PRESSURIZED SYSTEM - Do not break (open) any flanges or open any couplings until the system is depressurized at that location. Injury can result.**

- (a) A system is generally depressurized by opening valves in line of flow leading to a fabric collapsible tank. The valves upstream of section to be depressurized are left closed.
- (b) Individual pieces of equipment such as strainer in meter skid assembly, filter separators, and hose line pumps have individual vents and drains. After system has been depressurized, or that piece of equipment blocked in, vents and drains on equipment should be opened before that particular item is worked on. This will assure depressurizing of particular item.
- (c) The fuel dispensing assembly or optional tanker truck unloading system can be depressurized by opening valves in flow path to tanker truck after associated pump has been shut down and blocked in.

**Performance Steps**

- (d) Close valves in applicable flow line that is furthest upstream (closest to source of fuel under pressure) be closed first and sequentially followed by closing of valves downstream. This will avoid block in of fuel under pressure and thus enhance safety of system. A line closed off in this manner will be depressurized.
  - (e) When a system, or a portion of a system, must be drained for maintenance, it must be depressurized first. Obtain appropriate containers to hold the drained fuel for disposal. The closure at the lowest point should be opened first and the hose drained into the container(s). A closure at the highest point should be opened to allow complete drainage.
- (7) Emergency procedures.
- (a) Fire.
    - 1. Immediately shut off flow of fuel to area. If pump is involved, shut it down if possible.
    - 2. Begin extinguishing fire.
    - 3. Evacuate personnel not involved in fire.
    - 4. Remove any fuel accumulations that caused fire or may re-ignite.
  - (b) Hose line break or serious leak.
    - 1. Shut down any transfer taking place in that hose line.
    - 2. Extinguish any fire and stand by.
    - 3. Block in hose line in section having leak. Depressurize if under pressure. Drain hose line in that segment.
    - 4. Move hose line away from spill area.
    - 5. Isolate spill and clean it up.
  - (c) Fabric tank rupture or serious leak.
    - 1. Shut down any pumping into that tank.
    - 2. Extinguish any fire and stand by.
    - 3. Start pumping out of tank to another, a safe distance from ruptured tank. Empty ruptured tank completely.
    - 4. Check integrity of berm. Correct it to extent it is safe to do so. If berm has broken out or is leaking seriously, create earthen dams around drainage to isolate.
    - 5. Pump out any accumulated fuel inside the berm and/or dam.
  - (d) Break or serious leak on a pump.
    - 1. Shut down.
    - 2. Close block valves on each side of break.
    - 3. If there is a fire, extinguish it and stand by.
    - 4. Clean up spill.
  - (e) Serious spill due to operating error.
    - 1. Immediately shut down pump or pumps supplying spill. Shut off valves nearest to spill that can be closed safely.
    - 2. Extinguish any fire and stand by.
    - 3. Clean up spill.
  - (f) Overflowing tank.
    - 1. Shut down pumping into that tank.
    - 2. If a fire results, put it out and stand by.
    - 3. Begin pumping out of overflowing tank bringing level down to an acceptable point.
    - 4. Pump out any accumulated fuel inside berm.



**Performance Steps**

- (g) Critical situations.
  1. Coupling or flange leaks. Determine cause and have corrected.
  2. Fuel accumulations. Clean up immediately.
  3. Hot running pump. Take out of service and notify unit maintenance.
  4. Valve gland leaks. Notify unit maintenance.
  5. Valve or equipment cracks. Notify unit maintenance.
  6. Over filled tank. Pump off surplus immediately.

17. Preparation for storage.

**WARNING**

**PRESSURIZED SYSTEM - Do not break (open) any flanges or open any couplings until the system is de- pressurized at that location. Injury and fuel spills can result.**

- a. Depressurizing and draining system.

NOTE: The entire TPT hose line system should be pumped and drained to the fabric collapsible tanks to the extent possible. The fuel in the tanks can then be pumped to tanker trucks for disposal as called for by the operating authority.

- b. Disassembly and cleaning. The following guidelines are for the disassembly and cleaning of the system and each type of equipment.

**WARNING**

**To avoid explosion or fire, use only explosion-proof electrical equipment and enforce NO SMOKING rules in and around all areas in which tanks and other equipment are being cleaned.**

**CAUTION**

CLEAN AND DRY - All equipment must be clean and dry prior to preservation and packing. Water will result (depending on the materials or construction) in corrosion, mildew, and general deterioration. Fuel left in the equipment may be a fire hazard during transportation and storage. Dirt and debris can cause corrosion and can damage equipment.

**Performance Steps**

- c. Drain, dry, and disassemble fabric collapsible tanks.

**WARNING**

**FUEL SPILLS can result in saturated soil and cause a potential fire hazard.**

- (1) After tank has been pumped as dry as possible, remove hose lines and fittings from tank (except for bottom drain).
- (2) Roll tank up toward bottom drain. If equipment and manpower are available to do so, end of tank can be lifted to cause flow toward drain instead of rolling it up. Draw off accumulated fuel through drain valve into a sump or other suitable container which can be pumped dry later.
- (3) Lay tank out flat again. Flush tank out with water and detergent followed by a clean water rinse. Pump contaminated water to a disposal sump or tanker truck as best suits local situation. Repeat this process until flushed water is free of fuel. Drain as much water as possible from tank.
- (4) Remove tank from pad and berm and place it in a clean area. Clean tank thoroughly on outside.
- (5) Inflate tank with a low pressure air blower (maximum air pressure 0.1 psi). Continue to ventilate until dry. It may be necessary to swab out tank to completely remove water (and/or some fuel) in an expeditious way.
- (6) Roll up and transport tank to an inspection, preservation, and packing area.

**WARNINGS**

**Death or serious injury may result from exposure to toxic or flammable vapors or insufficient oxygen inside petroleum tanks. Do not enter a tank unless the atmosphere inside has been tested by technically qualified safety or health personnel to determine acceptable entry conditions.**

**If any fuel, fuel vapor, or sludge remains in the tank, or an oxygen deficiency exists, the tank must be treated as a "permit required confined space". No one may enter a permit required confined space without approval from qualified safety or health personnel, and without required protective clothing and equipment, rescue and emergency service, safety equipment, training, standby personnel, and written permit. If an explosive atmosphere exists within the tank, the tank presents an immediate hazard to safety and must not be entered under any circumstances. Death or serious injury may result if these precautions are not followed.**

- d. Disassemble, drain, and dry hose lines.

NOTE: All hose lines must be completely dry inside and clean on the outside before capping and before re-packing. It is recommended that all hose lines be tagged with identification at the disassembly site prior to transporting them to the inspection and packing area.

- (1) Disassemble hose lines.

**Performance Steps**

- (2) Suction hose lines. The suction hose lines should be drained into containers or a sump. They should then be flushed thoroughly with water and blown or swabbed dry. The sections should then be capped, cleaned externally, and transported to inspection and packing area.
- (3) Discharge hose lines. All 6-inch hose lines are to be drained, flushed with water, dried, capped, and transported to inspection and packing area. Use displacement.

NOTE: To avoid double handling, it is recommended that the 6-inch transfer hose line be thoroughly inspected as it is cleaned and stored. This will avoid having to remove the hose line again at the inspection and preservation area.

**WARNING**

**Because of potential for fire and/or explosion, the following safety regulations must be followed. There shall be no smoking allowed within 100 feet of the displacement and evacuation operations. Smoking shall be restricted to those areas designated as safe smoking areas. Fuel spills must be cleaned up promptly. Use an absorbent material and dispose of the used material at a designated location. Fuel saturated soil is a fire hazard. Access to spill areas should be restricted until appropriate action is taken and cleanup is complete.**

- e. Fuel displacement using displacement and evacuation kit.
  - (1) Place a hose clamp per (hose clamps are supplied as part of hose line installation and repair assembly) near hose double groove adapter from which hose line system starts. This will be near coupling which attaches hose line to pump, switching manifold, or tanker truck receipt manifold.
  - (2) Disconnect hose line from assembly or facility from which it originates. This is done by removing coupling clamp.
  - (3) Slide gasket away from center position between grooved fittings. Separate hose line from facility and remove gasket.
  - (4) Place displacement ball inside end of hose line adapter.
  - (5) Connect inlet ball with pneumatic coupler to hose line and where displacement ball was installed.
  - (6) Assemble a ball receiver assembly consisting of two 8 x 6-inch reducers, one 8-inch coupling clamp, and one 8-inch gasket. This is done by aligning 8-inch ends of reducers, installing 8-inch gasket and fitting, and closing snap lock coupling halves over joined ends of reducers.
  - (7) Determine hose line connector location at which ball receiver is to be installed.
  - (8) Use hose clamps, as required, to disconnect hose line segments and install ball receiver in hose line at determined field location. Align 6-inch end of reducer without internal rod stop toward end with displacement ball in it. Install a coupling clamp over joined grooved ends.
  - (9) Align 6-inch end of reducer with internal rod stop with next hose line segment. Install a coupling clamp over joined double grooved ends, thereby connecting receiver assembly to next hose line segment.
  - (10) Release hose clamps installed in step (8) by loosening screw handle.

### Performance Steps

- (11) Attach air compressor hose to ball inlet assembly. Release hose clamp installed near ball inlet assembly. Start air compressor and inject compressed air into ball inlet assembly installed in step (5). Air pressure of 20 to 25 pounds per square inch (psi) is usually required to move displacement ball at a satisfactory rate along hose line. The air compressor should be run until ball is observed entering ball inlet assembly. A sound will be heard when ball reaches ball receiver. If ball gets stuck, straighten kinks in line. Be observant to ensure that hose does not become over pressured.
  - (12) After ball has entered ball receiver assembly, stop air compressor and clamp down hose clamp on downstream side of ball receiver assembly. Uncouple and remove ball receiver from its location and hose clamps from evacuated hose segment.
- f. Air and fuel vapor.

### WARNING

**Ensure area is clear of smokers and all open flame or sparking devices. Fuel vapors and air are very explosive.**

- (1) Using attached upstream air compressor, inject compressed air into evacuated hose segment for at least 10 minutes, thereby blowing out any remaining fuel or fuel vapors. Air pressure of 20 to 25 pounds per square inch (psi) may be required.
- (2) After fuel vapors have been removed, install an airtight cap on open end of hose. If you do not have a cap, you can seal hose by bending it back on itself several times and tying hose securely.
- (3) Go to beginning of hose line section and disconnect air compressor hose from ball inlet assembly.
- (4) Attach suction of air ejector to ball inlet assembly.
- (5) Put compressor hose on inlet side of ejector. Start air compressor and inject compressed air into ejector. This creates a vacuum and draws any remaining fuel vapor and air from hose line and expels it from exhaust end of ejector assembly.
- (6) Operate ejector about 10 minutes for each 1,000 feet of hose. When hose flattens to a ribbon-like form, stop air compressor, fold back end of hose, and tie securely.
- (7) Remove ball inlet assembly and air ejector.
- (8) Place end cap on collapsed hose line to prevent hose from expanding before it is packed into flaking box.
- (9) When a hose line length has been evacuated, collapsed, and capped, it is ready for packing.

### WARNING

**Be very cautious when evacuating fuel vapors. Fuel vapor and air are an explosive mixture.**

- g. Four-inch hose lines are to be drained, flushed with water, dried, capped.
- h. Hose lines smaller than four inches must be drained, flushed, and dried without benefit of a displacement and evacuation kit.
- i. Aluminum fittings (tees, elbows, nipples, adapters, and so on) are to be swabbed, cleaned, and dried. Fittings should be tagged at time of removal to aid identification during re-packing box fittings.
- j. Coupling clamps and gaskets.
  - (1) Coupling clamps are to be swabbed clean and dry. Box coupling clamps.

**Performance Steps**

- (2) The gaskets are to be wiped clean and bagged or boxed. Gaskets that are obviously not usable under any circumstances should be disposed of immediately.
- k. Valves and valve assemblies. Drain, clean, and dry valve and valve assemblies.
- l. Pressure regulating valve assemblies, pressure control valve assemblies. These items are to be fully drained and swabbed clean and dry inside and outside. The control and pilot manifolding must be thoroughly drained. Blowing through the vents will aid in doing this.
- m. Meter skid assemblies (meter/strainer assemblies). These items must be drained and swabbed dry externally.
- n. Pumps and engines. Pumps are removed from system and thoroughly drained. Do not drain engine crankcase or fuel tank at this time. The equipment may be washed down externally and dried, as long as no water is allowed inside equipment.
- o. Floodlight sets. Floodlight sets are to be disassembled, cleaned, washed down, and thoroughly dried.
- p. Fire suppression equipment.
  - (1) Fire suppression equipment should be cleaned and removed from TPT site only after all fuel carrying equipment has been drained and removed from site and site vacated.
  - (2) Wash down and thoroughly dry all fire fighting equipment.
  - (3) Fire fighting clothing should be brushed or wiped off. It can be washed off but must be completely dried.
- q. Miscellaneous equipment. All miscellaneous equipment is to be swabbed clean and dry, tagged. External water wash of some equipment is permissible if there is no chance of getting water inside equipment.
- r. Fabric collapsible tanks.
  - (1) If cleaning and drying has been conducted properly, there should be no further work required on fabric tanks themselves. If they are not dry and clean inside and outside, additional work may be required.
  - (2) The valves, fittings, and hose lines that are part of tank supply are to be treated.
- s. Hose line assemblies.
  - (1) All hose line assemblies must be clean and dry inside and out. Faults are to be listed. Minor faults should be repaired before packing. Hose line assembly ends are to be sealed or capped. End fittings are to be coated with a preservative compound.
  - (2) Check that transfer hose lines contained in storage containers are dry. When in doubt, hose lines should be removed and thoroughly dried.
- t. Aluminum fittings. Aluminum fittings are clean and dry.
- u. Coupling clamps and gaskets.
  - (1) Coupling clamps are to be inspected for damage and cleanliness. If damaged, dispose of properly.
  - (2) Coupling clamps are to be cleaned of rust and painted.
  - (3) Damaged gaskets should be disposed of properly.
- v. Valves and valve assemblies. The valves are to be thoroughly clean and dry inside and out. Valve packing glands are to be loosened prior to preservation. Particular attention must be paid to coating glands and bushings. External machined surfaces such as valve stems are to be coated with a preservative. Valve bodies that require paint are to be painted, removing any corrosion. Seal or cap valve assembly pipe nozzles. Make the end seals as air tight as possible.
- w. Pressure regulating valve assemblies, pressure control valve assemblies.
  - (1) Disassemble pressure regulating valve only enough to inspect. Make sure unit has no standing water or condensation internally before preservation. Seal or cap off at nozzles to prevent entrance of water and minimize air circulation. Close off vents tightly.
  - (2) Paint as needed.
- x. Meter skid assemblies (meter strainer assemblies).
  - (1) Check unit through nozzles. Be sure there is no water present. If water is present, dry it out. If there is no corrosion, proceed with preservation. If corrosion is apparent, pass unit through maintenance channels for overhaul or disposition.

**Performance Steps**

- (2) Seal or cap off at nozzles. Air tightness is important.
- (3) Paint as needed.
- y. Pumps and engines. Proceed with preservation in accordance with TM 5-4320-305-10 for 600-GPM hose line pump and TM 5-4320-226-14 or TM 10-4320-324-14 for 350-GPM transfer.
- z. Floodlight sets. Proceed with preservation in accordance with TM 9-6320-211-14.
- aa. Fire suppression equipment. Proceed with preservation in accordance with TM 10-4210-235-13.
- ab. Miscellaneous equipment. Thoroughly inspect. Make any minor repairs necessary. Pass damaged equipment through appropriate maintenance authority for disposition. Lubricate and paint in accordance with TM 43-0139 as applicable.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	_____	_____
2. Read and understood unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	_____	_____
3. Wore appropriate PPE as required.	_____	_____
4. Performed before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotated on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.	_____	_____
5. Entered communication nets and conduct communication checks in accordance with unit SOP and Communication-Electronics Operating Instructions (CEOI).	_____	_____
6. Positioned major end items such as pumps, Twin Agent Unit (TAU), and floodlights, as directed by supervisor.	_____	_____
7. Placed flood light.	_____	_____
8. Placed 5,000 fabric collapsible tank.	_____	_____
9. Placed fuel dispensing assembly.	_____	_____
10. Assembled tanker truck receipt manifold.	_____	_____
11. Placed switching manifold.	_____	_____
12. Placed fire suppression equipment.	_____	_____
13. Placed contaminated fuel module.	_____	_____
14. Placed of transfer hose line assembly.	_____	_____
15. Prepared TPT for operation.	_____	_____
16. Operated TPT.	_____	_____
17. Prepared for storage.	_____	_____

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 1804  
DA FORM 2404  
DA FORM 3643  
DA FORM 4193  
DA FORM 5988-E  
FM 10-67-1  
TM 10-3835-231-13  
TM 10-4210-235-13  
TM 5-3835-220-13&P  
TM 5-4320-305-10  
TM 5-4330-211-12  
TM 5-5430-214-13&P  
TM 9-2330-356-14  
TM 9-6230-210-13&P

**Related**

AR 200-1  
FM 3-100.12  
FM 3-100.4

## Subject Area 4: PIPELINE OPERATIONS

**Perform Transfer Operations****101-92F-1204**

**Conditions:** Given the requirement to operate tank farm manifold valves to set up transfer operations in a field environment. Materials required to perform task: an operational Tactical Petroleum Terminal (TPT) fuel system; communication system; manifold system; fuel source; plug valve wrench; risk management procedures; applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE); Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; Oil Discharge Contingency Plan (ODCP) (if required); unit tactical standing operating procedure (TSOP); DA Form 3643 (Daily Issues of Petroleum Products), DA Form 2765-1 (Request for Issue or Turn-in), DA Form 4193 (Petroleum Products Pump Station Hourly Operations Record); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); and full access to all reference material.

**Standards:** Operate tank farm manifold valves to set up transfer operations ensured that correct line/tank valves are in right position (open/close), according to the pumping order, to prevent commingling products and maintaining fuel accountability.

**Performance Steps****DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

NOTE: In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements of the task before performing it to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.



**Performance Steps**

4. Wear appropriate PPE as required.

**CAUTION**  
 Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Perform before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to appropriate technical manuals (TMs). Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.
6. Make an intraterminal transfer through manifold as prescribed in pumping order.

**CAUTION**  
 Gloves, goggles, and hearing protection need to be worn when performing any fuel operation.

- a. Open appropriate valves on manifold and tanks for transfer.
  - b. Draw off all free bottom water from tanks.
  - c. Operate pumps according to task 101-92F-1451.
  - d. Complete DA Form 4193 on transfer operations.
7. Received/issued product through manifold as prescribed in pumping order.
    - a. Open appropriate valves on manifold and tanks for transfer.
    - b. Draw off all free bottom water from tanks.
    - c. Operate pumps according to task 101-92F-1451.
    - d. Complete DA Form 4193 on transfer operations.
    - e. Complete DA Form 3643 and DA Form 2765-1 for accountability of product.
  8. Close valves after operation according to pumping order.
  9. Complete and turn in DA Form 3643, DA Form 2765-1, DA Form 4193, DA Form 2404 or DA Form 5988-E to your supervisor.
  10. Report completion of transfer to operations office.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
5. Performed before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to appropriate technical manuals (TMs). Annotated on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.	—	—
6. Made an intraterminal transfer through manifold as prescribed in pumping order.	—	—
7. Received/issued product through manifold as prescribed in pumping order.	—	—
8. Closed valves after operation according to pumping order.	—	—
9. Completed and turned in DA Form 3643, DA Form 2765-1, DA Form 4193, DA Form 2404 or DA Form 5988-E to your supervisor.	—	—
10. Reported completion of transfer to operations office.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
 DA FORM 3643  
 DA FORM 4193  
 DA FORM 5988-E  
 FM 10-67-1  
 MIL-STD-3004A

**Related**

FM 10-416  
 FM 3-100.12  
 FM 3-100.4  
 FM 5-482  
 TM 10-4210-235-13  
 TM 5-3835-220-13&P  
 TM 5-4320-305-10

## Operate Pipeline Pumps

101-92F-1251

**Conditions:** Given the requirement to operate pipeline pumps on a 24-hour basis in a field environment. Personnel and materials required to perform task: four MOS-qualified (92F) Soldiers; operational pipeline system with 800-GPM mainline pump station; 600-GPM pump; Tactical Petroleum Terminal (TPT) fuel unit; risk management procedures; personal protective equipment (PPE); fire extinguishers; fuel source; oil; rags; pencil; applicable Material Safety Data Sheets (MSDS); Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; Oil Discharge Contingency Plan (ODCP) (if required); daily pumping order; unit tactical standing operating procedure (TSOP); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)); DA Form 4818 (Petroleum Products - Pump Station Operations Log); DA Form 4193 (Petroleum Products Pump Station Hourly Operations Record); DA Form 5464-R (Petroleum Products Pipeline Leakage Report), and full access to all reference material.

**Standards:** Perform operator's maintenance and operate pipeline pumps according to established pumping orders without injury to personnel, damage to equipment, or pollution of environment.

### Performance Steps

#### **DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

NOTE: In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.

## Performance Steps

4. Wear appropriate PPE as required.

### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Perform before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotate on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.
6. Operate pump station according to daily pumping orders.
  - a. Complete DA Form 4818 and DA Form 4193 as required.
  - b. Maintain communication with dispatch office at all times.

7. Operate 600-GPM pump.

NOTE: Prior to operating pumps, put on proper personal protection equipment (PPE) such as hearing protection, goggles, and gloves.

- a. Start 600-GPM (transfer and flood) pumps as follows:
  - (1) Open suction valve to ensure that pump is primed.
  - (2) If pump requires priming:
    - (a) Remove dust cap from priming port on pump body.
    - (b) Fill pump volute, with liquid that will be pumped, until it reaches bottom of suction pump.
    - (c) Replace dust cap and start pump. Repeat this process until primed.
  - (3) Open gate valve of pump discharge manifold assembly.
  - (4) Open needle valve of air valve cover assembly on discharge manifold assembly.
  - (5) Close discharge check valve.
  - (6) Align three way valve to desired fuel source.
  - (7) Set panel's light switch to bright or dim position as required.
  - (8) Turn SET POINT switch to middle of START RANGE.
  - (9) Set MODE SELECT switch to MANUAL position.
  - (10) Set START/STOP switch to START position.
  - (11) Press OIL BYPASS switch and hold while engaging engine.

### CAUTION

If engine fails to start within 10 seconds, release STARTER switch. Do not attempt starting again until starter motor stops turning. Failure to comply with this rule may result in serious damage to the starter motor.

- (12) Hold STARTER switch in UP position until engine starts.
- (13) Continue to press OIL BYPASS switch until oil pressure is greater than 40 pounds per square inch (psi).
- (14) Once oil pressure is greater than 40 psi, release OIL BYPASS switch.
- (15) Check to see that alternator light has gone out. Shut down engine if light does not go out.
- (16) After engine starts, observe TACHOMETER. Use SET POINT control knob to adjust engine to idle speed (approximately 800 to 900 RPM).
- (17) Open pump suction gauge. The gauge should show a vacuum. The pump may not prime immediately because suction hose must first fill with liquid. If pump fails to prime within five minutes, stop engine and inform your supervisor.

**Performance Steps**

- (18) Observe check valve on discharge manifold assembly to see that it is forced open when discharge pressure (indicated on pump discharge gauge) is high enough to initiate flow.
  - (19) Let pump warm up for three to five minutes with engine at idle speed.
  - (20) Partially close discharge gate valve. The discharge hose will fill slowly to guard against excessive shock pressure to fittings. As discharge hose fills, open discharge gate valve until it is adjusted to required discharge flow rate.
- b. Put pump on line.
    - (1) Open discharge valve when desired suction pressure is reached. At the same time increase pump engine speed to designated RPM.
    - (2) If multiple pumps are used, operate them all at the same RPM.
    - (3) Operate pump and perform during-operations PMCS according to TM.
  - c. Take pump off line.
    - (1) Shut down pump for a packed line.
      - (a) Close main line valve leading into pump station when specified line pressure is reached.
      - (b) If multiple pumps are used, take off line in reverse order that they were put on line.
      - (c) Idle engine of pump and then close pump discharge valve.
      - (d) Allow pump engines to idle for about five minutes to cool and then stop engines.
    - (2) Shut down pump for a slack line.
      - (a) Turn SAFETY CONTROL switch on pump unit to OFF. If pump units do not have safety control switches, manually reduce pump engine speed to idle and close discharge valves.
      - (b) Allow pumps to idle for five minutes and then stop engines.
      - (c) Close suction valves and perform after-operations PMCS.
      - (d) Annotate on DA Form 2404 or DA Form 5988-E any deficiencies and turn in to your supervisor.
  - d. Shut down 600-GPM pump.
    - (1) Slowly push in throttle control knob until engine is at idle speed.
    - (2) Allow pump to idle and cool down for 30 seconds.
    - (3) Set START/STOP switch to STOP.
    - (4) Turn PANEL LIGHT switch to OFF position.
    - (5) Close discharge manifold assembly gate valve to retain liquid in pump.
    - (6) Close suction assembly gate valve.
    - (7) Perform after-operations PMCS according to TM 5-4320-305-10.
    - (8) Annotate on DA Form 2404 or DA Form 5988-E any deficiencies and turn in to your supervisor.

**8. Operate 800-GPM pump.**

NOTE: Prior to operating pumps, put on proper personal protection equipment (PPE) such as hearing protection, goggles, and gloves.

- a. Start 800-GPM pump as follows:
  - (1) Shut engine enclosure doors.
  - (2) With clutch disengaged, turn pump shaft manually using coupling to gearbox. Ensure all rotating components are free to rotate.

**Performance Steps**

**WARNING**

**Both supply and return three-way fuel valves must be aligned to the same selected fuel supply (auxiliary or unit tank). Alignment to different supplies could cause engine overheating, shutdown from rapid fuel exhaustion, or fuel system overflow and the associated fire hazards.**

- (3) Align three-way valve on 110-gallon fuel tank to select desired source.

**CAUTION**

Never operate pumping assembly unless pump casing is filled to top of suction port. The pump will not prime when dry. Extended operation of a dry pump will destroy seal assembly and cause overheating which could seriously damage pump.

- (4) Priming 800-GPM pump.
- (a) Ensure drain plugs are tightened, suction valve is open, and discharge valve is closed.
  - (b) Place a catch basin beneath air vent discharge piping located between tool box and fuel tank.
  - (c) Fully open two lower pump air vent valves.
  - (d) Prime pump with fluid to be pumped.
  - (e) When fluid exits air vent discharge piping, close two lower pump air vent valves.
  - (f) Fully open two upper pump air vent valves.
  - (g) When fluid exits air discharge piping, close two upper air vent valves.
- (5) Open pressure switch valve.
- (6) Open suction and discharge pressure gauge line valves.
- (7) Open suction and discharge transducer valves.
- (8) Open suction valve.
- (9) Open four pump case vent valves.
- (10) Set power ON/OFF switch to on.
- (11) Set panel light ON or OFF as required.
- (12) Set mode control MAN/AUTO switch to MAN. Ensure suction pressure is at least 20 psi.
- (13) Set engine RPM/discharge pressure control fully counterclockwise.
- (14) Place ENGINE STOP switch in push position.
- (15) Press ENGINE START switch and keep it depressed until engine starts (but not longer than 30 seconds.)
- (16) Use starting aid when starting engine in temperatures below 40 degrees F.
- (17) Allow engine to idle at approximately 800 to 1,000 RPM.
- (18) Check suction gauge for suction pressure. Ensure suction pressure is at least 20 psi.
- (19) Run engine at idle until engine coolant temperature reaches a minimum of 140 degrees F and engine oil temperature is 10 degrees F or more.
- (20) Engage clutch to start pumping procedures.
- (21) Open discharge valve while keeping suction pressure at 100 psi.
- (22) Set mode control to AUTO.
- (23) Adjust discharge pressure control to get proper discharge pressure.
- b. Put pump on line.
- (1) Open discharge valve when desired suction pressure is reached. At the same time, increases pump engine speed to designated RPM.

**Performance Steps**

- (2) If multiple pumps are used, operate them all at same RPM.
- (3) Operate pump and perform during-operations PMCS.
- c. Take 800-GPM pump off line.
  - (1) Shut down 800-GPM pump for a packed line.
    - (a) Close main line valve leading into pump station when specified line pressure is reached.
    - (b) If multiple pumps are used, take pumps off line in reverse order that they were put on line.
    - (c) Idle engine of pump and then close pump discharge valve.
    - (d) Allow pump engines to idle for about five minutes to cool and then stop engines.
  - (2) Shut down 800-GPM pump for a slack line.
    - (a) Turn SAFETY CONTROL switch on pump unit to OFF. If pump units do not have safety control switches, manually reduce pump engine speed to idle and close discharge valves.
    - (b) Allow pumps to idle for five minutes and then stop engines.
    - (c) Close suction valves and perform after-operations PMCS.
    - (d) Annotate on DA Form 2404 or DA Form 5988-E any deficiencies and turn in to your supervisor.
- d. Shut down 800-GPM pump.
  - (1) Turn engine discharge pressure control fully clockwise to idle position.
  - (2) Allow engine to idle for 30 seconds.
  - (3) Set MAN/AUTO switch to MAN.
  - (4) Disengage clutch (down position).
  - (5) Close pump discharge and suction valves.
  - (6) Allow engine to idle and cool for one minute, then pull engine stop switch.
  - (7) Set power ON/OFF switch to OFF.
  - (8) Set PANEL LIGHT switch to OFF position, if used.
  - (9) Close suction valves and perform after-operations PMCS according to TM 10-4320-307-10.

9. Complete DA Form 2404 or DA Form 5988-E and turn it in to your supervisor.

10. Complete operations log according to task 101-92F-1406 and turn it in to your supervisor.

**Evaluation Preparation:** See task Conditions and Standards and have MSDS and all safety equipment.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—
5. Performed before-, during-, and after-operations PMCS on system's components according to appropriate technical manuals (TMs). Annotated on DA Form 2404 or DA Form 5988-E any faults found while performing PMCS.	—	—
6. Operated pump station according to daily pumping orders.	—	—
7. Operated 600-GPM pump.	—	—
8. Operated 800-GPM pump	—	—

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
9. Completed DA Form 2404 or DA Form 5988-E and turned it in to your supervisor.	—	—
10. Completed operations log according to task 101-92F-1406 and turned it in to your supervisor.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
DA FORM 4193  
DA FORM 4818  
DA FORM 5464-R  
DA FORM 5987-E  
DA FORM 5988-E  
DD FORM 1970  
TM 10-4320-307-10  
TM 5-4320-305-10

**Related**

FM 10-67-1  
FM 3-100.12  
FM 3-100.4



## Perform Pipeline Scraper Operations

101-92F-1256

**Conditions:** Given the requirement to perform scraper operations on an operational Inland Petroleum Distribution System (IPDS) system in a field environment. Materials required to perform task: operational pipeline system with 800-gallons per minute (GPM) mainline pump station; 600-GPM pump; Tactical Petroleum Terminal (TPT) fuel unit; outgoing cleaner barrel assembly; scraper; wrenches; rags; brush; spill containers; fire extinguishers; risk management procedures; personal protective equipment (PPE); communication system; applicable Material Safety Data Sheets (MSDS); Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; Oil Discharge Contingency Plan (ODCP) (if required); daily pumping order; unit tactical standing operating procedure (TSOP), and full access to all reference material.

**Standards:** Launch, receive pipeline scraper, and clean strainer without injury to personnel or damage to equipment or the environment.

### Performance Steps

#### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

NOTE: In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Wear appropriate PPE as required.

#### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

## Performance Steps

### 5. Launch scraper.

#### CAUTION

Gloves, goggles, and hearing protection need to be worn when performing any fuel operation.

#### a. Drain the outgoing cleaner barrel.

NOTE: The pipeline dispatcher will schedule the actual scraper operation on a pumping order.

- (1) Open bypass valve.
- (2) Close side and mainline valve to block off launcher barrel from main pipeline.
- (3) Open launcher assembly vent valve to relieve pressure.
- (4) Open drain valve and drain fuel from launcher barrel end closure into an appropriate container. Dispose waste fuel in an environmentally safe manner according to local policies and procedures.

#### b. Insert scraper into outgoing cleaner barrel.

- (1) Open safety vent and then open launcher barrel end closure.
- (2) Insert scraper into launcher barrel. Using side valve handle, push scraper as far as it will go beyond side valve into launcher barrel.

NOTE: Unless scraper is pushed completely to front of barrel, it will not launch.

#### c. Open appropriate valves to launch scraper.

- (1) Close and tighten end closure, close safety vent valve, and close drain valve.
- (2) "Set" scraper indicator by pushing flag down.
- (3) Slowly open side valve all the way.
- (4) Close launcher assembly vent valve when barrel is full.
- (5) Slowly open mainline valve when told by dispatcher to launch scraper.
- (6) Slowly close bypass valve.
- (7) Watch scraper indicator that shows when scraper has been launched. The flag will pop up when scraper is launched. Notify dispatcher the moment scraper is launched.
- (8) Open bypass valve after scraper has been carried out of launcher barrel by flow of fuel.

NOTE: Always operate with "wet" barrel leaving side valve, mainline, and bypass valves open.

### 6. Observe pipeline during scraper operations.

#### a. Take corrective actions if scraper does not launch (flag does not pop up).

- (1) Recheck valves according to performance measure 5.
- (2) Attempt to re-launch scraper using slightly higher pressure in pipeline.
- (3) Inform supervisor and wait for further instructions if scraper still does not launch.

#### b. Monitor scraper during operations.

- (1) Monitor scraper location by either listening for its movement through pipeline or by logging volume of liquid pumped through pipeline. The scraper travels 1 mile for each 8,185 gallons pumped through pipeline.
- (2) Calculate time required for scraper to travel to receiving station.
  - (a) Calculate total volume needed to move scraper between launcher and receiver by multiplying distance between them by 8,185 gallons.
  - (b) To estimate travel time in minutes from launcher to receiver, divide volume calculated in (a) above by flow rate of pipeline.
  - (c) Inform receiving station of expected arrival time of scraper.
- (3) Take corrective action if scraper becomes stuck.
  - (a) Increase pressure in line to free scraper as directed by dispatcher.
  - (b) Inform your supervisor and wait for further instructions if increasing pressure does not free scraper.

NOTE: Do not place another scraper in the line to free the first scraper.

### 7. Receive scraper.

**Performance Steps**

NOTE: Prior to receiving scraper, side valve, mainline valve, and bypass valves must be open.

- a. Open appropriate valves to receive scraper into incoming cleaner barrel.
  - (1) Close bypass valve.
  - (2) Set scraper indicator.
  - (3) Open bypass valve after scraper has entered receiver assembly. You will know when this happens because the flag will pop up.
  - (4) Close mainline and side valves on receiver barrel.
  - (5) Open receiver barrel vent valve and drain valve. Drain fuel into a suitable container. Dispose fuel in an environmentally sound manner according to locally established procedures.

- 8. Remove scraper from incoming cleaner barrel.
  - a. Open appropriate vales to remove scraper.
    - (1) Open safety vent and then open receiver barrel.
    - (2) Remove scraper and strainer from within barrel.
    - (3) Clean receiver barrel and strainer. Put strainer back in receiver barrel.
    - (4) Close and tighten end closure and close safety vent.

NOTE: Tighten safety vent valve hand tight only.

- (5) Close drain valve.
- (6) Open side valve slowly to fill receiver assembly with fuel and then close receiver barrel vent.
- (7) After receiver barrel is full, open mainline valve and close bypass valve.
- (8) During normal pumping operations, leave all valves open. The system should be run with a "wet" barrel.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—
5. Launched scraper.	—	—
6. Observed pipeline during scraper operations.	—	—
7. Received scraper.	—	—
8. Removed scraper from incoming cleaner barrel.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

<p><b>Required</b>                  FM 10-67-1                  TM 10-4320-307-10</p>	<p><b>Related</b>                  FM 3-100.12                  FM 3-100.4</p>
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**Maintain Petroleum Pipeline Sections****101-92F-1322**

**Conditions:** Given the requirement to assemble and maintain an operational Inland Petroleum Distribution System (IPDS) in a field environment. The Soldier (assigned to a petroleum pipeline platoon) must assemble and maintain petroleum pipeline sections to ensure pipeline readiness for transporting petroleum products to supported units. Personnel and materials needed to perform mission: two military occupational specialty (MOS)-qualified (92F) Soldiers to assist; operational pipeline system; IPDS pipeline sections; risk management procedures; applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE); fire extinguishers; spill kit/containers; repair clamps (over coupling clamp or half saddle clamp); tools (hose line installation and repair assembly, cutting and grooving machine, and pipeline tapping equipment); communication system; high-mobility multipurpose wheeled vehicle (HMMWV); Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; unit standing operating procedure (SOP); daily pumping orders, and full access to all reference materials.

**Standards:** Assemble, monitor, and maintain petroleum pipeline sections to ensure leakages are detected and repairs are made while transporting petroleum products to supported units.

**Performance Steps****DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

NOTE: In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements of the task before doing it to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.

## Performance Steps

4. Wear appropriate PPE as required.

### CAUTION

Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Perform services on pipeline valves.

a. Gate valves:

- (1) Lubricate threads with fine film of motor oil, which is non-soluble in water.

NOTE: Do not use grease; it can harden and collect sand and dirt threads.

- (2) Repack valve if necessary.

- (a) Close valve completely to keep fuel in line.

- (b) Remove hand wheel nut and hand wheel on non-rising stem gate valves. Skip this step on rising stem gate valves.

- (c) Remove packing nuts, packing flange, and gland.

- (d) Remove old packing from stuffing box with a packing tool and clean stuffing box.

- (e) Cut a new piece of graphite spiral or graphite rings to fit stuffing box. Use old packing as a cutting guide. If rings are used, cut rings so that ends meet exactly.

- (f) Coil new piece of graphite into stuffing box or place rings on top of one another in such a way that ends of each layer meet on opposite side of stem from previous layer. Force packing down firmly in place.

- (g) Put gland, packing flange, and packing nuts back in place. Alternate tightening nuts. Back off on nuts until they are a little more than hand tight.

- (h) Put hand wheel and hand wheel nuts back in place. Tighten nut.

- (i) Open valve and check for leaks. If necessary, adjust packing nuts to stop a leak.

b. Globe valve replace packing (Figure 1).

- (1) Make sure valve is closed.

- (2) Remove hand wheel nut and hand wheel.

- (3) Remove packing nut and gland.

- (4) Remove old packing with a packing tool or hook.

- (5) Cut a new piece of graphite spiral or ring to fit. Use old packing as a cutting guide. Cut rings so that ends meet exactly.

- (6) Coil new piece of graphite in place or place rings on top of one another so that ends of each layer meet on opposite side of stem from previous layer. Force packing down firmly in place.

- (7) Put gland and packing nut back in place. Tighten nut.

- (8) Put hand wheel and hand wheel nut back in place. Tighten nut.

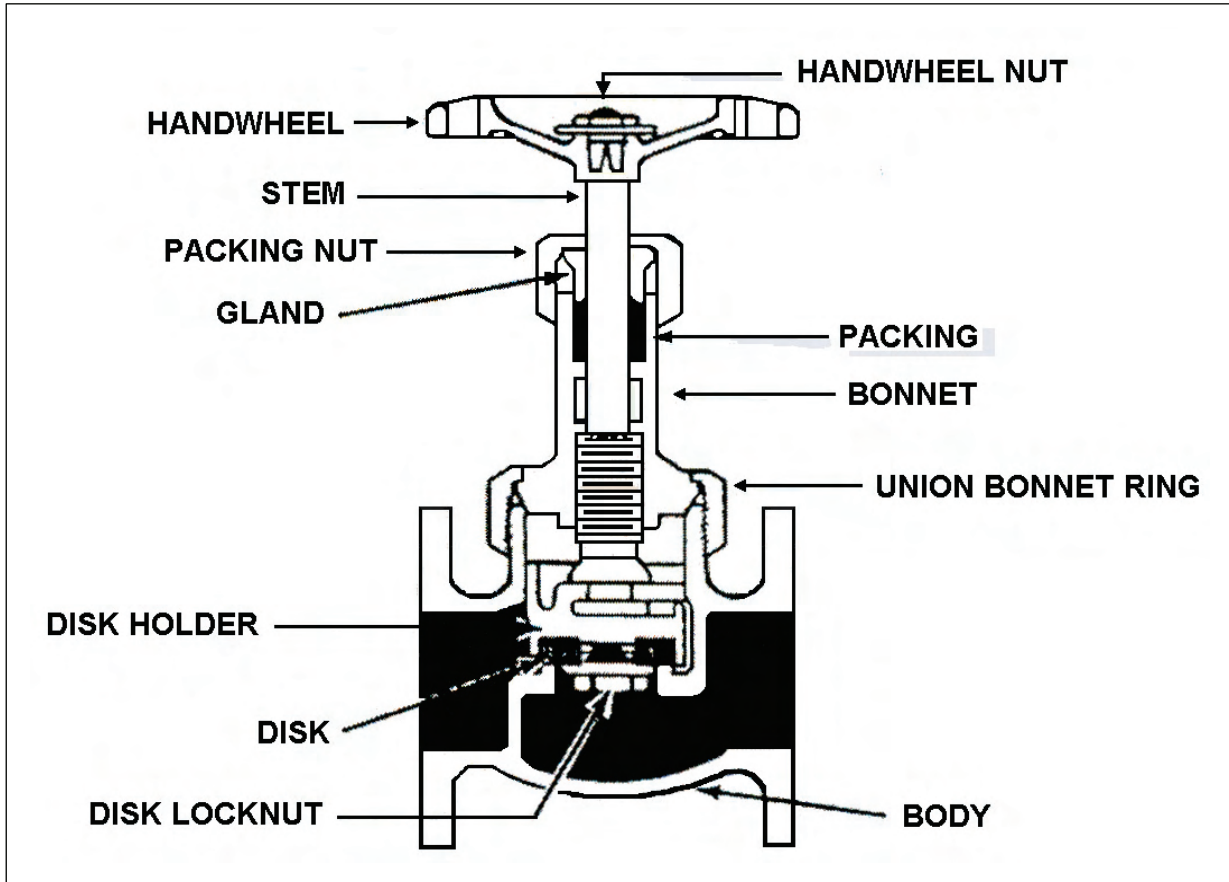


Figure 1

**Performance Steps**

c. Plug valves (Non-rising Stem Gate Valve (Figure 2).

- (1) Check lubricant to make sure it is free of dirt, sand, and any foreign matter that could clog lubrication grooves or act as an abrasive between plug and body of valve.
- (2) Remove lubricant screw.
- (3) Add lubricant and replace screw. Tighten screw to force lubricant down into all parts of valve. One or two sticks or a few strokes of a grease gun should be all that is needed.

NOTE: Do not over do it because any excess lubricant will pass into the line.

- (4) Operate valve for a moment to check lubrication. The valve is properly lubricated if plug turns easily.

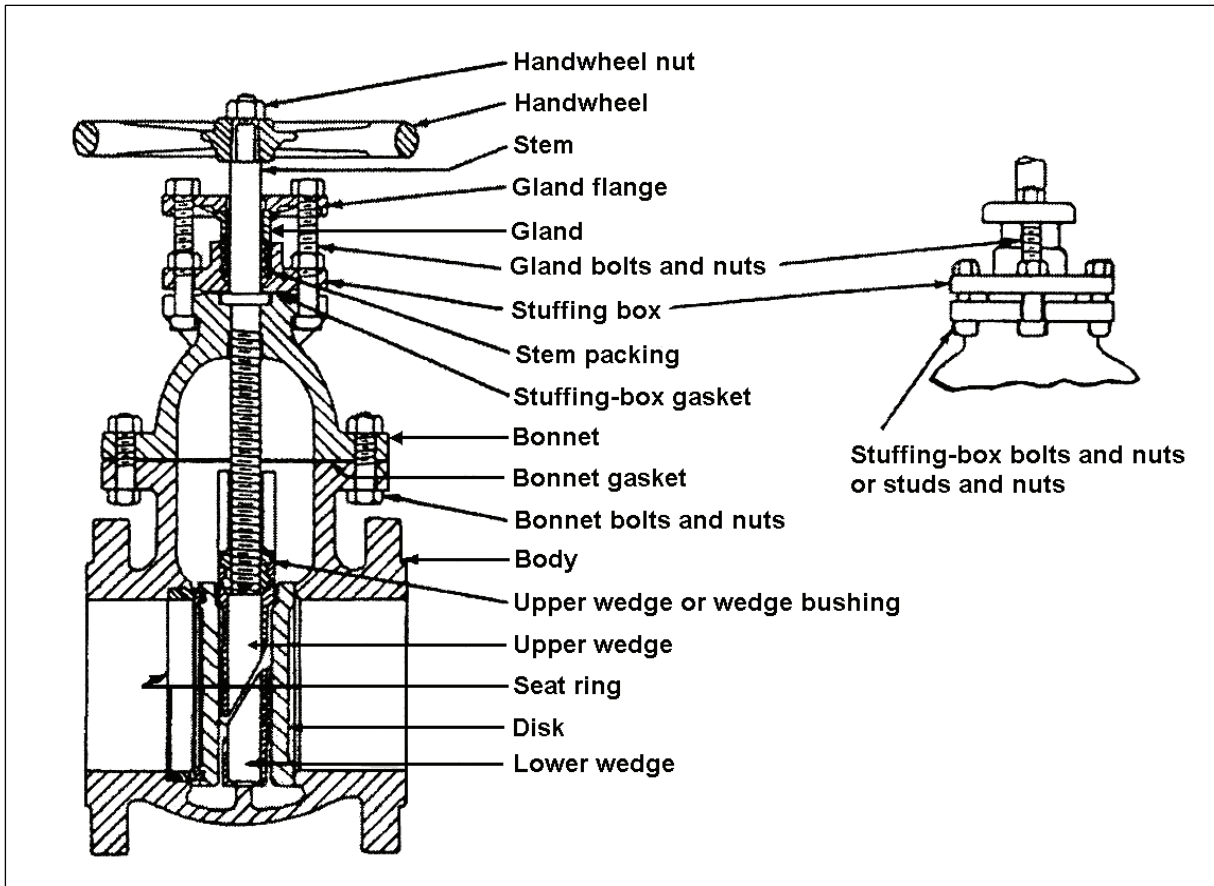
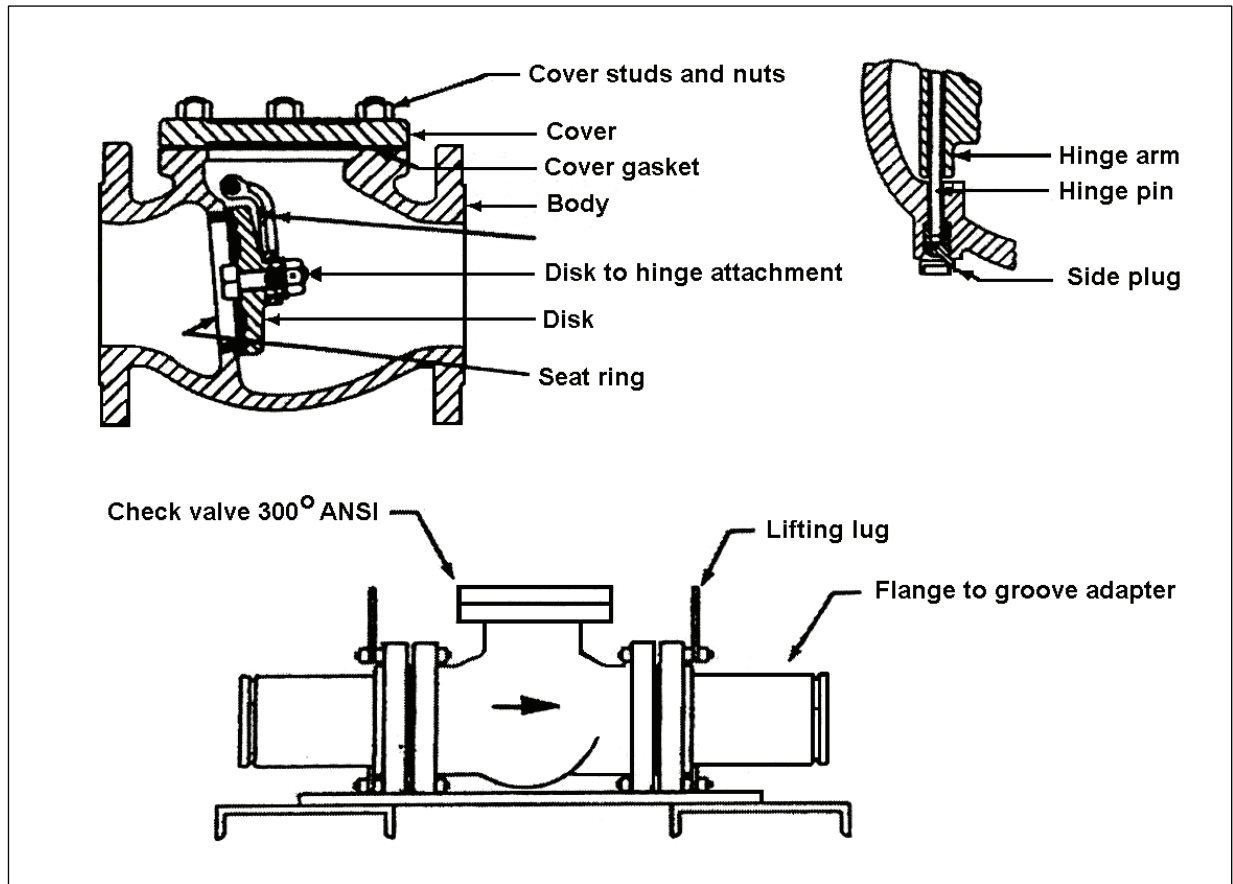


Figure 2

**Performance Steps**

- d. Check valves by tightening cover nuts regularly (Figure 3).



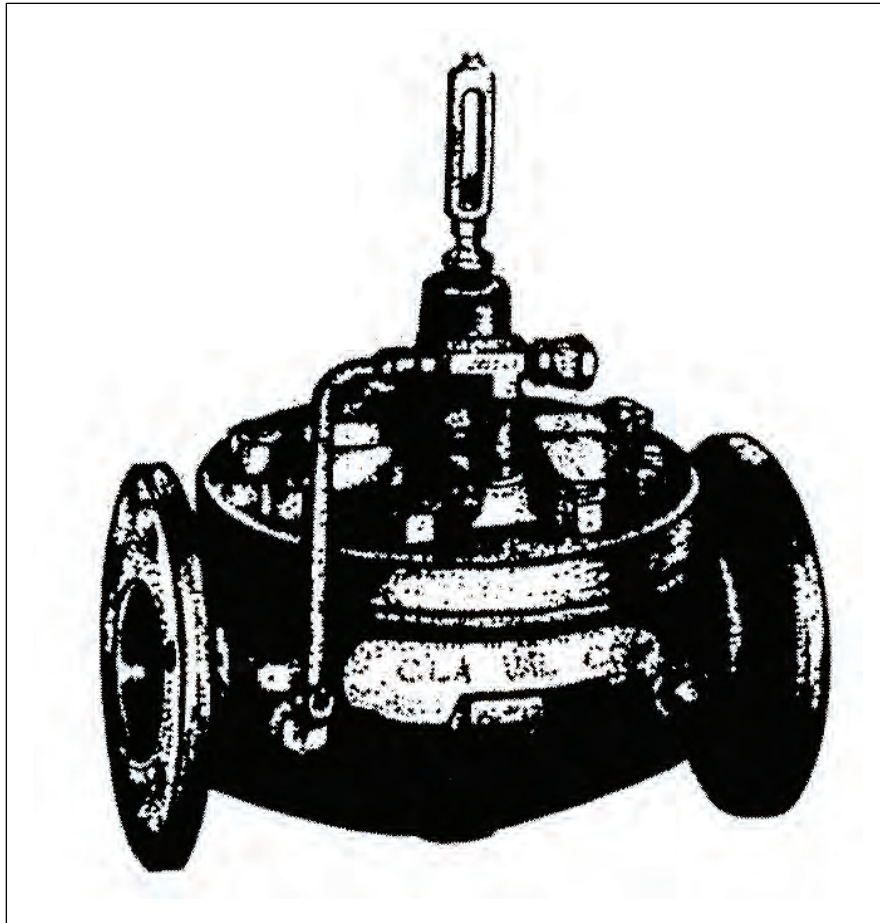
**Figure 3**

**Performance Steps**

- e. Pressure Reducing Valve (Figure 4).
- (1) Inspect small strainer on pilot tube at least every 3 months. If this strainer becomes clogged, valve will malfunction. Clean strainer when necessary.
  - (2) Remove diaphragm and inspect it once a year for wear and breaks in synthetic rubber material.

NOTE: If diaphragm ruptures or breaks open, valve will close automatically.





**Figure 4**

**Performance Steps**

6. Conduct patrols on pipeline to check for damage, leaks, and indication of pilferage.
  - a. Notify supervisor of any leaks on pipeline and fill out DA Form 5464-R (Petroleum Products Pipeline Leakage Report) according to task 101-92F-1406.
  - b. Maintain communication with dispatch office at all times.

7. Perform temporary repairs as required using half saddle clamp, repair clamp, and over coupling clamp.

NOTE: The repair clamp and the over coupling clamp are components of IPDS system. It is not necessary to stop pumping operations while repair clamps are being installed.

- a. Install Half Saddle Clamp (Figure 5).
  - (1) Place saddle half of clamp around pipeline to cover leak with gasket and saddle.
  - (2) Place clamp stirrups around pipeline and align through saddle half.
  - (3) Place nuts on ends of stirrups and tighten nuts.
- b. Install Repair Clamp (Figure 6).
  - (1) Place one half under pipeline at hole.
  - (2) Put bolts in upper half of clamp, with longer bolts in center.
  - (3) Place upper half of clamp over bottom half and align bolts.
  - (4) Place nuts on bolts and tighten center bolts first.

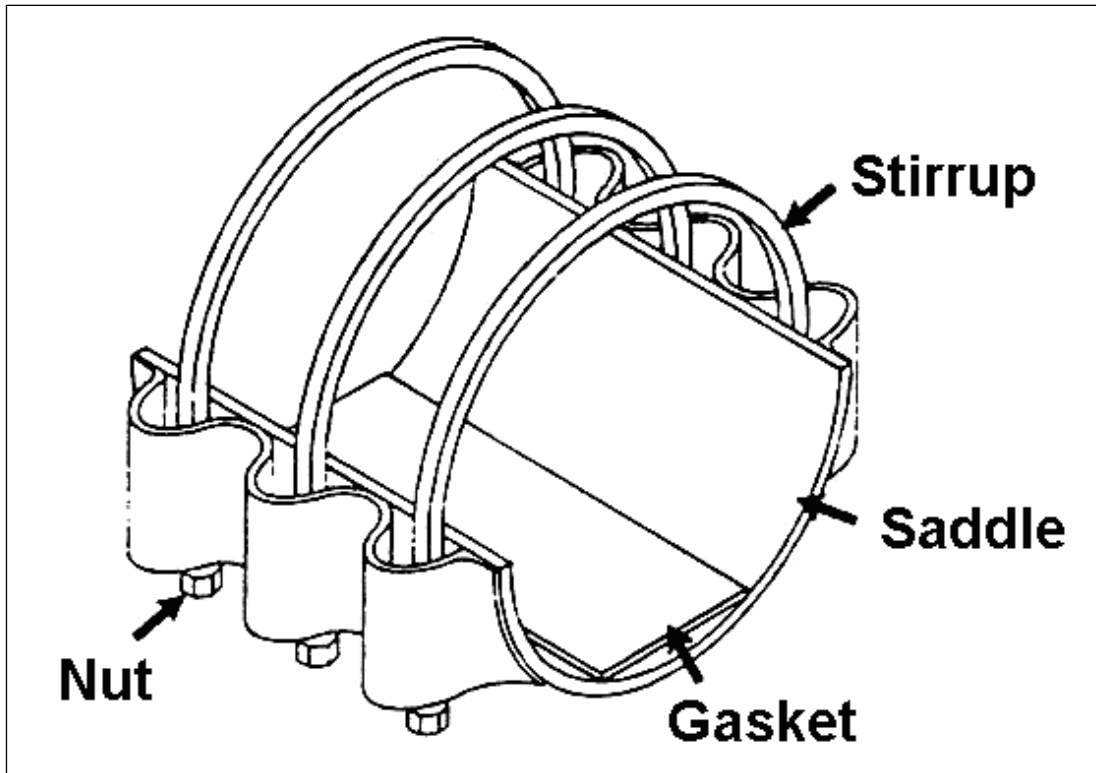


Figure 5

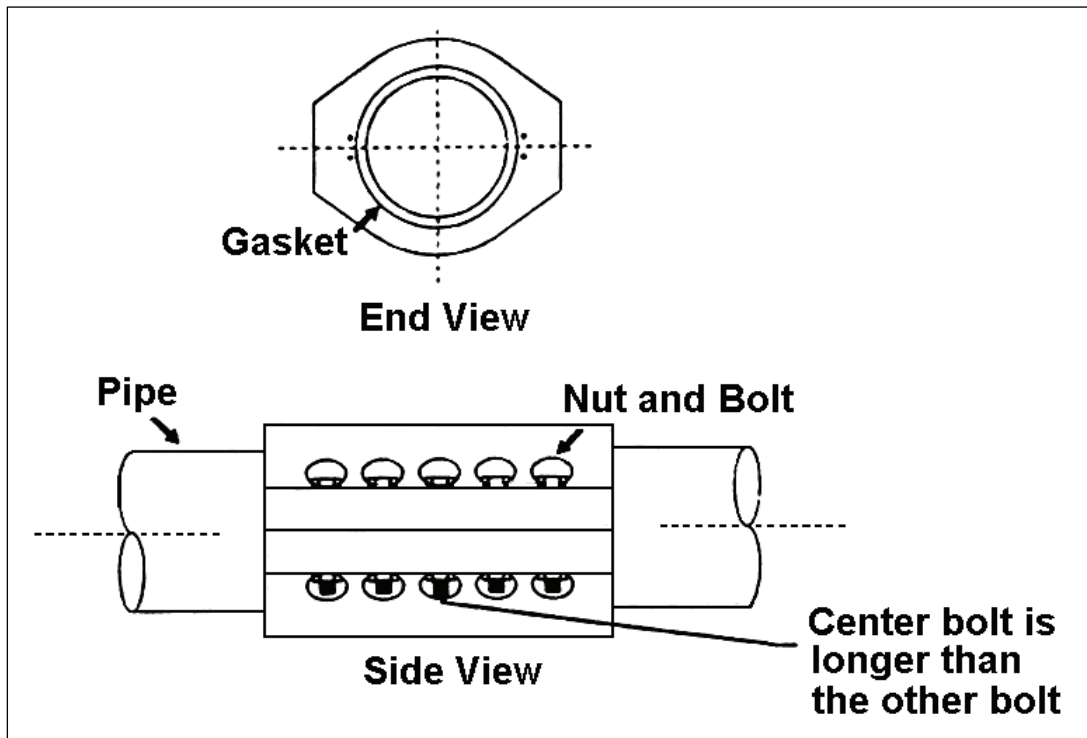


Figure 6

**Performance Steps**

c. Install Over Coupling Clamp (Figure 7).

NOTE: Before installing over coupling clamp, move pipe and coupling back and forth and up and down to seal gasket and stop leak. If this action does not stop leak, install over coupling clamp over faulty coupling.

- (1) Dig a hole under leaking coupling, large enough to hold large over coupling.
- (2) Swing five bolts away from over coupling clamp.
- (3) Open over coupling clamp, lubricate all exposed gasket surfaces, and slide it over leaking coupling.
- (4) Swing five bolts back into place.
- (5) Tighten bolts in order, as marked on top of over coupling clamp.

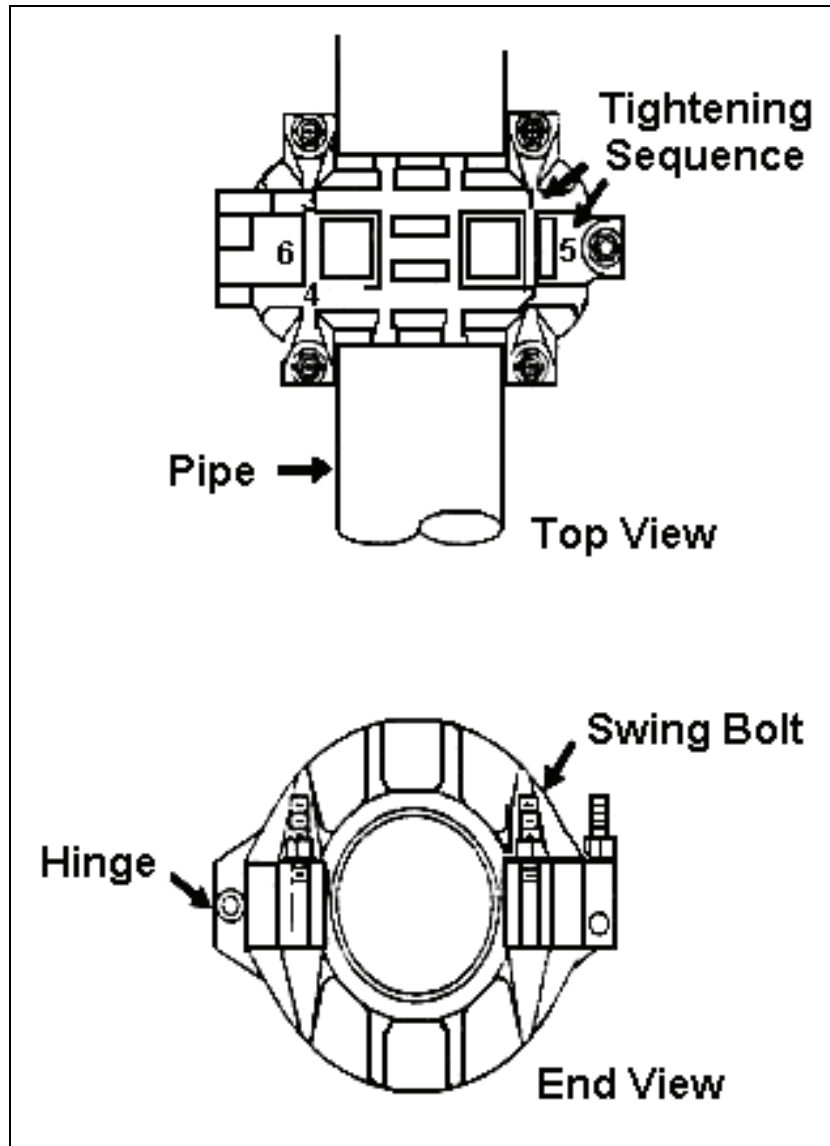


Figure 7

### Performance Steps

8. Perform permanent repairs such as replacing damage pipeline section and coupling.  
 NOTE: All major repairs will be under direct supervision of pipeline dispatch OIC. No work requiring connecting/replacing components will be done without authorization of pipeline dispatch OIC.

- a. Position fire extinguishers and spill containers.
- b. Close valves on both sides of pipe section.
- c. Drain and recover product remaining in damaged section of line.

NOTE: Using tapping machine, tap into pipeline and remove fuel as follows (Figure 8) identify components listed in a below.

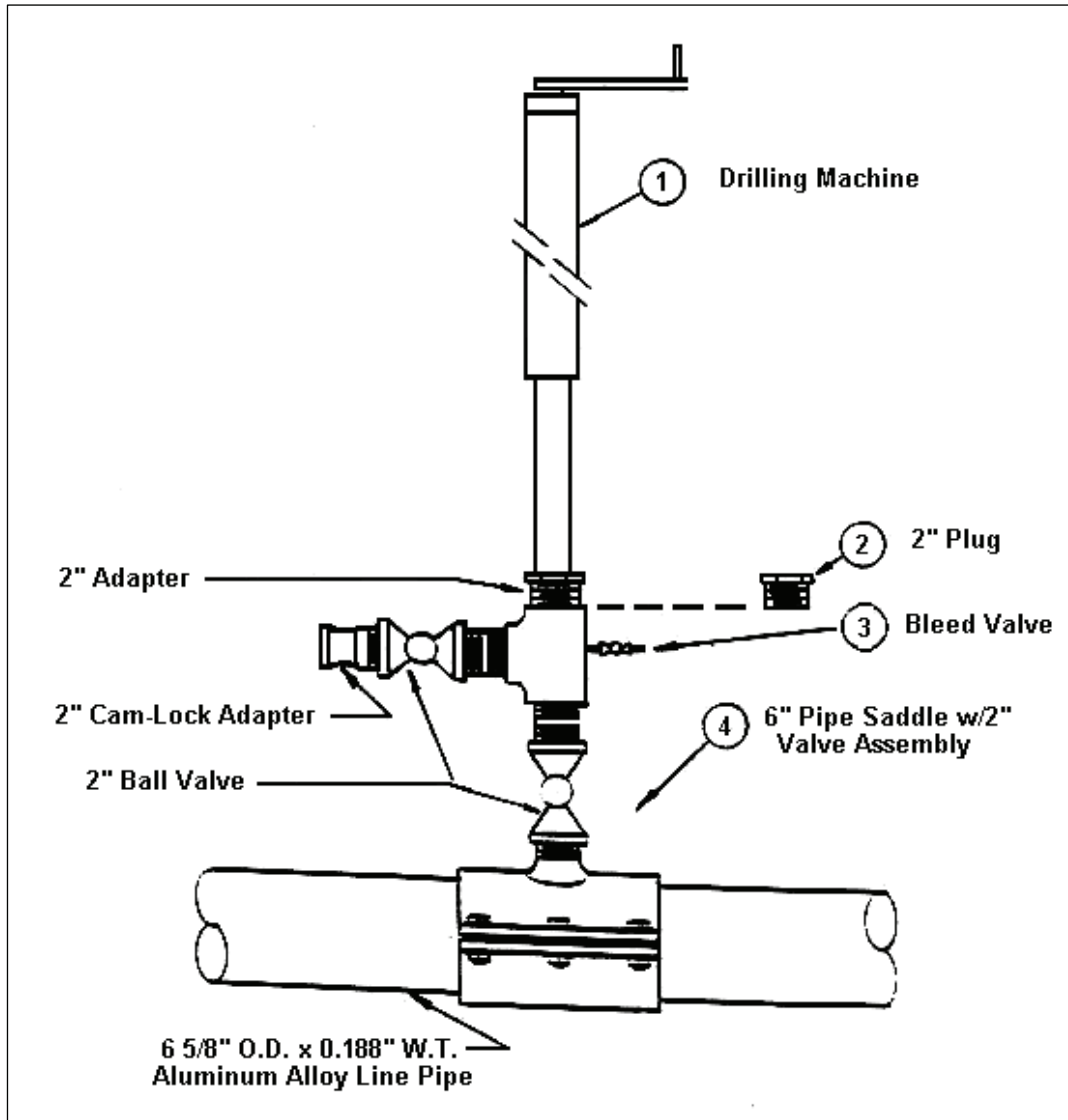


Figure 8

**Performance Steps**

d. Hot Tap (Drilling) Machine with Ratchet Crank.

(1) The Hot Tapping Machine consists of the following components:

Quantity	Description
1	Hot Tap (Drilling) Machine with Ratchet Crank
1	Plug, 2-inch, HH, NPT
1	Bleed Valve
1	Pipe Saddle, 6-inch, with 2-inch Valve Assembly (Tee, Ball Valves, 2-inch Cam Lock Adapter)

(2) Safety Considerations. Any operation involving work on pipe containing liquid fuels under pressure is potentially hazardous. Therefore, it is necessary that correct procedures be followed in the use of this equipment to maintain a safe working environment.

**Performance Steps**

- (3) Operate Tapping Machine. When installing threaded piping components, always use Teflon tape sealant on threads prior to making connection. This will ensure a tight seal. Perform the following steps to install and operate tapping machine:
- (a) Determine pipeline location at which line will be tapped.
  - (b) Install the 6-inch bolt on pipe saddle with 2-inch valve assembly at that point. Liberally apply seal grease on seal inside upper section of 6-inch saddle pipe to setting it into pipe.
  - (c) Install bleed valve into side of tee in valve assembly. Be sure to place tape sealant on threads. Leave valve in open position.
  - (d) Remove 2-inch plug from upper section of valve assembly.
  - (e) While holding calibrated body tube, rotate feed tube clockwise to extend boring bar until set screws are visible. Remove set screws with 1/8 hex key.
  - (f) Attach hole saw to holder pilot.
  - (g) Insert holder pilot into boring bar. Align holes in boring bar and holder pilot shank. Insert set screws and tighten with 1/8 hex key. Do not use grease in hole saws.
  - (h) To retract hole saw, hold body tube and rotate feed tube counterclockwise until feed tube is at the zero mark on calibrated body tube. At this point, hole saw is completely retracted.
  - (i) Calculate travel distance required for pilot drill tip to contact pipe. Take correct measurements to avoid tapping through bottom of pipe or making an incomplete tap.
    - Measure distance "A" (top face of 2-inch tee to top of pipe).
    - Measure distance "B" (bottom of adapter to pilot drill tip) and add to distance "A". This measurement should be taken prior to installing machine into tee.
    - Measure thread makeup each time as it can vary. This is done by measuring threaded length on adapter prior to installation and subtracting exposed threaded length after installation. Subtract it from the sum of ("A" + "B"). This total figure should be the body tube reading as pilot drill tip contacts pipe.
  - (j) Make a mark on calibrated body tube at measurement calculated in step 9. The feed tube should be at this measurement on the body tube as pilot drill tip contacts pipe.
  - (k) Apply sealant tape to threaded adapter. Attach drilling machine with adapter to previously installed tee. Close and open vertical ball valve to ensure it functions properly. Be sure valve is in FULL OPEN position before continuing to the next step.
  - (l) Rotate feed tube clockwise. Drill extends until it contacts pipe. The feed tube should be at mark placed on the body tube in step 10.
  - (m) The computed cutting distance is .50 inches. This cutting distance, plus the initial reading on the body tube when the pilot drill contacts the pipe, is the final reading on the body tube when the tap is completed. Mark this final reading on the body tube.
  - (n) Attach ratchet handle to 1/2 hex drive. Best results will be obtained if the handle is rotated 360 degrees while cutting. Turn in a clockwise direction only. Do not OVERFEED. This can cause damage to pilot drill tip or the hole saw. The rate of advance for the hole saw is adjustable by tightening or loosening the feed adjustment knob at the top of the drilling machine. Loosen for slower feed, tighten for faster feed.
  - (o) As the pilot drill penetrates the pipe wall, allow line fluid to completely fill valve and fitting. Be sure bleed valve is open. Blow line contents through bleed valve to purge all air. Close bleed valve when all air is purge. As tap nears completion, cutting noise may become loud and irregular. This is caused by coupon changing shape or relieving stress. If pipe is highly stressed at the tapping location, hole saw may become locked by loosened coupon. In this case, loosen feed adjustment knob and retract hole saw by turning feed tube one revolution counterclockwise. Resume tap (slow feed) to clean burr from hole.

**Performance Steps**

- (p) When second mark is reached on body tube, tap should be complete. At this point feed tube should turn fast as drive cap (no clutch slipping) and will advance at full feed of 1/8 per revolution. The feed and rate of feed confirm that the tap is complete.

**WARNING**

**Do not travel more than 3 1/2 inches after the pilot tip touches the pipe. If this distance is exceeded, hole saw or pilot drill will damage or penetrate the bottom of the pipe.**

- (q) Retract hole saw. Rotate feed tube counterclockwise. Hole saw will retract until feed tube is at zero mark on body tube or until the feed tube comes to a firm stop
- (r) Close tapping valve.
- (s) Bleed off all pressure trapped in valve adapter by opening bleed valve on adapter.
- (t) Remove drilling machine.
- (u) Install 2-inch hex head plug into the 2-inch tee.
- (v) To enable coupon to slide off pilot drill, coupon must be pushed up to allow Unwire to rotate as shown in position 2.
- e. Remove couplings and gaskets from pipe section to be replaced.
- f. Hold new pipe in alignment with existing pipeline.
- g. Replace couplings and gaskets as necessary. If old couplings and gaskets are damaged, replace them using the following procedures:
- (1) Swab ends of pipe sections.
  - (2) Clean ends of pipe sections with a wire brush to remove flaking paint and scale.
  - (3) Smooth out the inside of pipe grooves with a file.
  - (4) Clean both halves of new split ring coupling (6-inch repair clamp for IPDS) with a wire brush.
  - (5) Slip round gasket over one end of one pipe section.
- NOTE: IPDS couplings have pre-inserted gaskets.
- (6) Align ends of pipe section.
  - (7) Slide gasket into place over ends of two pipe sections.
  - (8) Grease a 1- to 2-inch area on each end of both halves of new split ring coupling with automotive and artillery grease.
  - (9) Place one half of split ring coupling (6-inch repair clamp for IPDS) over bottom half of gasket on pipe.
  - (10) Coat coupling bolts with a thin film of grease and put them in coupling over bolts.
  - (11) Slide other half of split ring coupling (6-inch repair clamp for IPDS) over two bolts.
  - (12) Hold two halves of coupling together and attach nuts to bolts.
  - (13) Alternate tightening each nut two turns at a time so that the coupling halves close evenly and do not pinch the gasket.
9. Test pipeline to ensure it does not leak. Open gate valves slowly to put pressure back on new section. Observe new section closely for leaks.
10. Repair/replace pipeline sections as necessary.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—
5. Performed services on pipeline valves.	—	—
6. Conducted patrols on pipeline to check for damage, leaks, and indication of pilferage.	—	—
7. Performed temporary repairs as required using half saddle clamp, repair clamp, and over-coupling clamp.	—	—
8. Performed permanent repairs such as replacing damage pipeline section and coupling.	—	—
9. Tested pipeline to ensure it does not leak. Opened gate valves slowly to put pressure back on new section. Observed new section closely for leaks.	—	—
10. Repaired/replaced pipeline sections as necessary.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**  
 DA FORM 5464-R  
 FM 10-67-1

**Related**  
 FM 5-482



## Perform Interface Cut Operations

### 101-92F-1401

**Conditions:** Given the requirement to divert petroleum products in a operational Inland Petroleum Distribution System (IPDS) system in a field environment. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers to assist; risk management procedures; multi-product operational pipeline system; Tactical Petroleum Terminal (TPT) fuel unit; an operating pump station; daily pumping order; a manifold system; communications system; personal protective equipment (PPE); chemical protective gloves; containment and clean up equipment; hydrometer cylinder; set of thermo hydrometers (hydrometers with integral thermometers); level work surface; rags; temperature of petroleum product; corrected American Petroleum Institute (API) gravity of product; applicable Material Safety Data Sheets (MSDS); Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; Oil Discharge Contingency Plan (ODCP) (if required); unit standing operating procedure (SOP), and full access to all reference material.

**Standards:** Monitor flow of each batch and interface to ensure products are not commingled and that the environment and surrounding area are not damaged.

#### Performance Steps

### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

NOTE: In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements before performing the task to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (such as valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor.

1. Apply risk management procedures.
  - a. Understand and execute the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Employ Environmental Stewardship Protection Program Measures according to task 101-92F-1413.
3. Read and understand unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.

**Performance Steps**

4. Wear appropriate PPE as required.

**CAUTION**  
 Gloves, hearing protection, and goggles need to be worn when performing any fueling operation.

5. Obtain API gravity (at line temperature) for batch being pumped.
6. Take a line sample at least every 5 minutes, starting 20 minutes before the expected time of the interface arrival.
7. Determine API gravity for each sample as it is taken.
8. Take a line sample every minute starting at five minutes before expected time of interface arrivals.
9. Take line samples two or three times per minute when interface arrives.
10. Open or close valves as required by OPORD.
11. Take a sample to laboratory after each product switch.
12. Clean up any spills and report as required by unit policies and procedures and applicable environmental laws.

**Evaluation Preparation:** See task Conditions and Standards and have MSDS and all safety equipment.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed Environmental Stewardship Protection Program Measures according to task 101-92F-1413.	—	—
3. Read and understood unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—
5. Obtained API gravity (at line temperature) for batch being pumped.	—	—
6. Took a line sample at least every 5 minutes, starting 20 minutes before expected time of interface arrival.	—	—
7. Determined API gravity for each sample as it is taken.	—	—
8. Took a line sample every minute starting at five minutes before expected time of interface arrival.	—	—
9. Took line samples two or three times per minute when interface arrives.	—	—
10. Opened or closed valves as required by OPORD.	—	—
11. Took samples to laboratory after each product switch.	—	—
12. Cleaned up spills and reported as required by unit policies and procedures and applicable environmental laws.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**  
FM 10-67-1

**Related**  
FM 3-100.12  
FM 3-100.4

## Prepare Petroleum Pump Station and Pipeline Reports

101-92F-1406

**Conditions:** Given the requirement to maintain records on pump stations within an operational Inland Petroleum Distribution System (IPDS) system in a field environment or Military Operation in Urban Terrain (MOUT). Materials required: risk management procedures, operational pump station, pencil, DA Form 4193 (Petroleum Products Pump Station Hourly Operations Record), DA Form 4818 (Petroleum Products - Pump Station Operating Log), and DA Form 5464-R (Petroleum Products Pipeline Leakage Report), and full access to all reference material.

**Standards:** Make all entries on pump station and pipeline reports accurately and legibly using operational data and turn them into the supervisor.

### Performance Steps

1. Complete DA Form 4818.
  - a. Enter date, unit name, pump station name, and pump station number, in their respective blocks.
  - b. Enter hourly operational data in appropriate columns on front and back of forms. Enter data on DA Form 4818. Enter following data elements for each hourly observation in the labeled columns as follows:
    - (1) Time (fill in the actual times worked this day (if less than 24 hours) and year. The person in charge of shift signs here).
    - (2) Each pump's serial number.
    - (3) For each pump enter the following information:
      - (a) Suction pressure (psi).
      - (b) Discharge pressure (psi).
      - (c) RPM.
      - (d) Oil pressure.
      - (e) Water temperature.
    - (4) For station enter:
      - (a) Suction pressure.
      - (b) Discharge pressure.
      - (c) GPM pumped.
    - (5) In Remarks: Enter total hours of operations for each pump and any comments as required by local policies and procedures.
    - (6) Daily total pumped: Enter barrels pumped for that day.
    - (7) Pump Station Operators: Enter for each shift: Beginning time/date of shift and ending time/date of shift. Print or type name and grade of operator.
    - (8) Sign as pump station operator in signature at bottom on back of form.
    - (9) Turn in completed form to your supervisor to obtain signature and grade of section chief and platoon leader in appropriate blocks at bottom of form.
2. Complete DA Form 5464-R.
  - a. Enter all necessary information in blocks at top of form.
    - (1) Date.
    - (2) Time.
    - (3) To: (higher headquarters name).
    - (4) From: (unit designating report).
    - (5) Reported by (name and grade).
    - (6) Platoon and Section (of reporter).

**Performance Steps**

- b. Enter location, cause, and disposition information in blocks at middle of form.
  - (1) Enter the following information in blocks under location of leak.
    - (a) Pumping station (enter station number).
    - (b) Joint number.
    - (c) Fuel lost (enter estimated spill amount in gallons).
  - (2) Enter cause of leak in "Apparent Causes of Leak" block.
  - (3) Enter corrective actions taken in "Disposition" block.
  - (4) Enter any other preventive measures taken in "Precautions Taken" block.
- c. Turn in completed forms to your supervisor to obtain signature and grade of section chief and platoon leader in appropriate blocks at bottom of form.

3. Complete DA Form 4193.

- a. Date.
- b. Unit.
- c. Station: Enter name of station for which this report is being made.
- d. Pump Station Number.
- e. Batch Number.
- f. Time.
- g. Origin or Destination:
  - (1) Storage Tank: Enter tank number and time discharge valve was turned on or off.
  - (2) Other: If batch was not taken from a storage tank, enter identification of storage device from which batch was taken.
- h. Line Temperature in Degrees F.
- i. Pump Station Pressure: Enter suction pressure (psi) and discharge pressure (psi).
- j. Product or Grade.
- k. Gallons This Hour.
- l. Total Barrels Pumped.
- m. Sample Number.
- n. Daily Totals: Enter total of all gallons pumped this 24-hour period.
- o. Remarks: Enter any remarks concerning anything that may have occurred during the day. Be sure to identify by time which period with which remarks are associated.
- p. Shift Hours: Enter span of each shift worked for first, second, and third shifts.
- q. Name and Grade: The supervisor of each shift prints his/her name and grade and signs report.

**Evaluation Preparation:** See task Conditions and Standards.

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
1. Completed DA Form 4818.	—	—
2. Completed DA Form 5464-R.	—	—
3. Completed DA Form 4193.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 4193
- DA FORM 4818
- DA FORM 5464-R
- FM 10-67-1

**Related**

Skill Level 2

Subject Area 5: SUPERVISING GENERAL PETROLEUM OPERATIONS

**Supervise Fire Fighting Operations**

**101-92F-2315**

**Conditions:** Given the requirement to supervise the use of petroleum fire fighting equipment to contain or extinguish a fire in a field environment. Materials required to perform task: fire extinguishers; risk management procedures, applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE), fire protection suits (coat, trousers, boots, hood, harness, and gloves); a Twin Agent Unit (TAU) with nitrogen containers, aqueous film forming foam (AFFF) solution, and dry chemical; a simulated or actual controlled fire; Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required), Hazardous Material Information Sheets (HMIS), unit's standing operating procedure (SOP), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)), and full access to all reference materials.

**NOTE:** If required to suppress a fire using the TAU, additional personnel of six military occupational specialty (MOS)-qualified (92F) Soldiers will be required.

**Standards:** Supervise the use of petroleum fire fighting equipment and procedures to extinguish a fire without further damage to equipment or injury to personnel or to the environment.

**Performance Steps**

**DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL. WEAR THE APPROPRIATE PPE SUCH AS FACE SHIELD/GOGGLES AND CHEMICAL PROTECTIVE GLOVES AS IDENTIFIED IN THE APPLICABLE REFERENCES MSDS.**

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
3. Ensure personnel read and understand unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Enforce wearing of appropriate PPE as required.
5. Supervise before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to unit SOP and appropriate technical manuals (TMs). Ensure personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.

**Performance Steps**

6. Ensure fire fighting equipment is on hand and serviceable.
  - a. Appropriate fire extinguishers.
  - b. Shovel, pick, axe, and so on.
7. Determine ignition sources as part of fire prevention inspection.
  - a. Broken fuel lines, leaking valves, or pumps.
  - b. Spontaneous combustion.
  - c. Burning gases.
  - d. Poor housekeeping.
8. Ensure alarm is sounded and proper authorities are notified.
9. Supervise fire fighting procedures.
  - a. Ensure type of fire is correctly identified.
  - b. Supervise selection of correct fire extinguisher for type of fire to be extinguished.
  - c. Supervise inspection of fire extinguisher.
  - d. Direct use of fire extinguisher to correctly extinguish fire.
  - e. Make on the spot corrections as necessary.
10. Supervise operation of TAU according to unit SOP and TM 10-4210-235-13.
  - a. Ensure personnel are fitted with complete fire suit (gloves, boots, trousers, coat, and hood) and that they are properly worn.
  - b. Ensure personnel follow procedures when using a TAU system on a petroleum fire.
  - c. Ensure assembly of TAU according to TM 10-4210-235-13.
  - d. Ensure TAU is operational ready according to TM 10-4210-235-13.
  - e. Ensure fire fighting procedures are followed according to unit SOP.
  - f. Ensure personnel return TAU to operational ready status according to TM 10-4210-235-13
11. Render first aid as needed.
12. Initiate an investigation to determine cause of fire.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Supervised before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate TMs. Ensured personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	—	—
6. Ensured fire fighting equipment is on hand and serviceable.	—	—
7. Determined ignition sources as part of fire prevention inspection.	—	—
8. Ensured alarm is sounded and proper authorities are notified.	—	—
9. Supervised fire fighting procedures.	—	—

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
10. Supervised operation of TAU according to unit SOP and TM 10-4210-235-13.	—	—
11. Rendered first aid as needed.	—	—
12. Initiated an investigation to determine cause of fire.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
DA FORM 5988-E  
FM 10-67-1  
TM 10-4210-235-13

**Related**

FM 3-100.12  
FM 3-100.4



## Supervise Environmental Stewardship Protection Program Measures

### 101-92F-2401

**Conditions:** Given the requirement to supervise the control and handle any hazardous waste (HW) material or other hazardous material (HM) which might generate HW in a field environment. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers; risk management procedures; applicable Material Safety Data Sheets (MSDS); Hazardous Material Identification System (HMIS); Facility Response Plan (FRP); Spill Prevention Response Plan (SPRP), Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required), the unit HW/HM management policy, personal protective equipment (PPE), unit standing operating procedure (SOP), and full access to all reference material.

**Standards:** Supervise handling and disposition of all HM and HW in a manner which has no detrimental effects on the environment.

#### Performance Steps

### DANGER

**FAILURE TO PERFORM THIS TASK MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL. WEAR THE APPROPRIATE PPE (SUCH AS FACE SHIELD/GOGGLES AND CHEMICAL PROTECTIVE GLOVES) AS IDENTIFIED IN THE APPLICABLE REFERENCES (MSDS).**

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Maintain MSDS.
  - a. Identify potential environmental hazards.

NOTE: Read MSDS and HMIS.

  - b. Extract information from MSDS.
  - c. Determine safety measures from MSDS.
  - d. Implement safety measures extracted from MSDS.
3. Ensure personnel read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Wear appropriate PPE as required.
5. Supervise handling/controlling hazardous material and ensure unit hazardous material management policy complied with MSDS.
  - a. Make personnel aware of hazards to which they are exposed (Right-to-Know law).
  - b. Strictly enforce safety precautions.

**Performance Steps**

- Supervise storage of hazardous water materials according to unit SOPs.

<p><b>WARNING</b></p> <p><b>Never place HW or HM in a dumpster. This is an illegal disposal.</b></p>
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- Observe operation to prevent and clean up spills according to unit SOPs.
- Ensure all spills and leaks are reported to chain of command according to the Installation Spill Control Plan (ISCP) and Spill Prevention Response Plan (SPRP) and unit HW/HM including filling out and processing turn-in document.
- Supervise procedures for turn-in of HW/HM including filling out and processing turn-in document.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Maintained MSDS.	—	—
3. Ensured personnel read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Wore appropriate PPE as required.	—	—
5. Supervised handling/controlling hazardous material and ensured unit hazardous material management policy complies with MSDS.	—	—
6. Supervised storage of hazardous water materials according to unit SOPs.	—	—
7. Observed operation to prevent and clean up spills according to unit SOPs.	—	—
8. Ensured all spills and leaks are reported to chain of command according to the Installation Spill Control Plan (ISCP) and Spill Prevention Response Plan (SPRP) and unit HW/HM including filling out and processing turn-in document.	—	—
9. Supervised procedures for turn-in of HW/HM including filling out and processing turn-in document.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

<b>Required</b>	<b>Related</b>
AR 200-1	
FM 10-67-1	
FM 3-100.12	
FM 3-100.4	

## Supervise Sling Loading of Packaged Petroleum Products

101-92F-2402

**Conditions:** Given the requirement to supervise transportation of packaged petroleum products (500-gallon collapsible drums) by air in a field environment. Personnel and materials to perform mission: three military occupational specialty (MOS)-qualified (92F) Soldiers; helicopter, risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE); packaged petroleum products, fabricated static electricity discharge probe, clevis assembly, slings, tape, helmet, A-22 cargo bag, multiple leg sling set, pickup zone markers and marker light set, unit standing operating procedure (SOP), DA Form 7382-R (Sling Load Inspection Record), and full access to reference material. This task is performed in day and night environments.

**Standards:** Supervise the sling loading of packaged petroleum products and 500-gallon collapsible bag for external airlift using the A-22 cargo bag and the sling set without error, making sure the aircraft carrying capacity is not exceeded.

### Performance Steps

#### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure personnel read and understand unit or installation standing operating procedure (SOP)/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
3. Enforce wearing of appropriate PPE as required.
4. Identify type of helicopter required to conduct sling load operations according to FM 10-450-3, Table 2-1.
5. Identify safety equipment used by ground crew.
  - a. Identification tags.
  - b. Goggles.
  - c. Ear plugs.
  - d. Shock proof gloves or leather gloves.
  - e. Helmet or kevlar.
  - f. Smoke grenade.
  - g. Flashlight with wand.
6. Prepare and set up landing zone (LZ) to conduct sling load operations according to FM 10-450-3, paragraph 4-3.
  - a. Select location of aircraft landing site to best support operation in coordination with unit liaison officer.
  - b. Clear obstacles on and around the LZ.
  - c. Check slope of ground surface for day and night operations.

### Performance Steps

- d. Check aircraft approach to landing site for day and night approaches.
- e. Check aircraft formation landing approach for a large tactical relocation re-supply mission.
- f. Mark landing points according to type of aircraft.
- g. Mark obstacles that are difficult to detect or impossible to remove (such as wires, holes, stumps, and rocks).

NOTE: All trees, brush, stumps, or other obstacles that could cause damage to the rotor blades or the underside of the aircraft must be cleared around the landing points. If trees must be cut, stumps in the immediate vicinity of the landing points must be cut as close to ground level as possible. It may be necessary to use axes, matches, chain saws, or demolitions to clear underbrush and trees. It is not necessary to clear grass shorter than 1 foot that covers a level field unless a fire risk exists. Hard packed sod makes the best natural landing area.

7. Use available cargo-carrying devices to conduct sling load operations according to FM 10-450-3, paragraph 8-2.
  - a. Deploy A-22 cargo for sling load operations.
    - (1) Identify specifications of A-22 cargo bag according to FM 10-450-3, paragraph 8-2, Appendix I.
    - (2) Identify maximum weight capacity for A-22 cargo bag.
  - b. Prepare A-22 cargo bag for use.
    - (1) Prepare sling assembly.
    - (2) Prepare cover assembly.
    - (3) Position load on A-22 cargo bag.
    - (4) Close cover on A-22 cargo bag.
    - (5) Close sling assembly on A-22 cargo bag.
    - (6) Attach suspension web.
    - (7) Attach suspension clevis.
    - (8) Adjust lateral straps.
8. Prepare load for pickup.
  - a. Identify specifications of cargo net according to FM 10-450-3, paragraph 7-2.
    - (1) Prepare flat web nylon cargo net for use.
    - (2) Determine weight capacity of cargo net.
    - (3) Inspect nets.
    - (4) Rig cargo net.
    - (5) Repair cargo net.
    - (6) Place all netted loads for hook up.

NOTE: Never use the nylon rope attached to hoist link as part of the sling attachment system. The rope is only used to handle and spread the net.

- b. Deploy cargo slings for sling load operations.
        - (1) Identify cargo sling required for operation.
        - (2) Make sure that sling set fits load.
9. Deploy reach pendants and supplemental equipment for sling load operations.
  - a. Determine correct reach pendants and supplemental equipment used to conduct sling according to FM 10-450-3, paragraph 8-4.
  - b. Inspect reach pendant before and after use.
  - c. Clean and store reach pendant after use.

NOTE: An older 25,000-pound capacity reach pendant, issued with an aircraft aerial recovery kit (ARK), P/N 1670EG093-1 is no longer authorized for use in sling load operations.

- d. Identify supplemental equipment needed for sling load operations according to FM 10-450-3, paragraph 8-6.
          - (1) Verify weight capacity for a large clevis.
          - (2) Verify weight capacity for medium clevis.
          - (3) Verify weight capacity for small clevis.
          - (4) Verify weight capacity for anchor shackles.
          - (5) Check tape for break strength rating.

**Performance Steps**

- (6) Check cotton webbing for break strength rating.
- (7) Check nylon cord for break strength.
- (8) Check protective padding.
- (9) Check 15-foot tie-down strap type.
- (10) Check load binder.

NOTE: The nut and bolt assemblies of different sized clevises are not interchangeable. See Appendix B for bolt and nut national stock numbers (NSNs) for each clevis assembly.

- 10. Prepare DA Form 7382-R to verify that sling load is done correctly and according to FM 10-450-3, Appendix I.
- 11. Distribute DA Form 7382-R to proper units.
  - a. Send one copy to supporting aviation unit.
  - b. Secure tape and tie to load.
  - c. Send one copy to supported unit.
- 12. Organize and train hook up team for sling operations.
  - a. Designate duties and responsibilities of hook up team during sling load operations according to FM 10-450-3, paragraph 3-10 and Chapter 5.
    - (1) Identify general hook up procedures.
    - (2) Identify safety precautions for hook up team.
    - (3) Identify responsibilities of hook up man.
    - (4) Identify responsibilities of static probe (wand) person.
  - b. Designate signalman duties and responsibilities of loading and take off for sling load operations according to FM 10-450-3, Appendix A.
- 13. Establish air-to-ground communications.
  - a. Verify radio frequency.
  - b. Monitor communication device throughout sling load operation.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured personnel read and understood unit or installation SOP/operations orders (OPORD) requirements for requisitioning, storage, handling, and disposal of hazardous materials.	—	—
3. Enforced wearing of appropriate PPE as required.	—	—
4. Identified type of helicopter required to conduct sling load operations according to FM 10-450-3, Table 2-1.	—	—
5. Identified safety equipment used by the ground crew.	—	—
6. Prepared and set up LZ to conduct sling load according to FM 10-450-3, paragraph 4-3.	—	—
7. Used available cargo-carrying devices to conduct sling load operations according to FM 10-450-3, paragraph 8-2.	—	—
8. Prepared load for pickup.	—	—
9. Deployed reach pendants and supplemental equipment for sling load operations.	—	—

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
10. Prepared DA Form 7382-R according to FM 10-450-3, Appendix I.	—	—
11. Distributed DA Form 7382-R to proper units.	—	—
12. Organized and trained hook up team for sling operations.	—	—
13. Established air-to-ground communications.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 7382-R
- FM 10-450-3
- FM 10-450-4
- FM 10-450-5

**Related**

- FM 10-67-1
- FM 3-100.12
- FM 3-100.4

## Supervise a Petroleum Pilferage Control Program

**101-92F-2403**

**Conditions:** Given the requirement to supervise a petroleum pilferage control program in a field environment. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers; operational petroleum facility, risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE), unit standing operating procedure (SOP); oral or written operations order (OPORD), and full access to reference material.

**Standards:** Supervise a petroleum pilferage control program according to appropriate regulations and unit SOP to ensure the security of government property.

### Performance Steps

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure personnel read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
3. Enforce wearing of appropriate PPE as required.
4. Maintain security requirements for petroleum facility.
  - a. Determine size and location of facility to identify security requirements.
  - b. Check vehicles and personnel for concealed items.
  - c. Check for pilfered items shipped through collusion.
5. Assign checkpoint personnel to inspect all vehicles entering and leaving facility. Ensure personnel inspect the following items:
  - a. Driver's license and vehicle dispatch.
  - b. Unauthorized contents.
  - c. Vehicle serviceability.
  - d. Tank compartment.
  - e. Fire extinguishers and grounding cable.
6. Maintain and account for seals issued to users.
  - a. Safeguard all seals issued to users.
  - b. Verify correct seal numbers are annotated on shipping documents.
  - c. Have security personnel verify seal numbers at every stop and at all exits and entrances.
7. Monitor personnel patrolling pipelines and hose lines for security hazards. Ensure personnel check for the following:
  - a. Loose bolts and couplings.
  - b. Holes under pipelines and hose lines.
  - c. Sabotage.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured personnel read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
3. Enforced wearing of appropriate PPE as required.	—	—
4. Maintained security requirements for petroleum facility.	—	—
5. Assigned checkpoint personnel to inspect all vehicles entering and leaving facility.	—	—
6. Maintained and accounted for seals issued to users.	—	—
7. Monitored personnel patrolling pipelines and hose lines for security hazards.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**  
AR 190-13

**Related**  
FM 10-67-1  
FM 3-100.12  
FM 3-100.4



## Supervise Sampling and Gauging Procedures

### 101-92F-2404

**Conditions:** Given the requirement to supervise sampling and gauging procedures in a field environment. Personnel and materials required to perform task: two military occupational specialty (MOS)-qualified (92F) Soldiers; risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE), petroleum products in petroleum storage/handling containers, sampling and gauging equipment, a clear sample bottle, refueling tank vehicle (or other sample source), a drip pan or suitable container for waste fuel, a petroleum product sample for visual examinations, petroleum storage containers with product weighted beaker, bacon bomb thief, 1-gallon sample can, fuel handlers gloves, pencil, DA Form 1804 (Petroleum Sample), DA Form 3853-1 (Innage Gage Sheet (Using Innage Tape and Bob)), DA Form 3853-2 (Outage Gage Sheet (Using Innage Tape and Bob)), DA Form 3853-3 (Outage Gage Sheet (Using Outage Tape and Bob)), sample cans/bottle, Millipore sampling kit, clean paper towels and rags, aviation fuel in refueling vehicles/system, hydrometer cylinder, Aqua-Glo test kit, 1-quart clear sample bottles, Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; unit standing operating procedure (SOP); and full access to reference materials.

**Standards:** Supervise sampling and gauging procedures, ensuring representative samples and accurate gauge results are obtained to account for quality and quantity of product in petroleum storage/handling containers.

#### Performance Steps

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
3. Ensure personnel read and understand unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Enforce wearing of appropriate PPE as required.
5. Ensure personnel are available and trained to perform sampling and gauging procedures.
6. Supervise inventory of sampling and gauging kit for completeness according to component listing.
7. Check petroleum products for water and sediment contamination according to unit tactical standing operating procedure (TSOP).
8. Control sampling and gauging operation, making on-the-spot corrections.
9. Check DA Form 1804, DA Form 3853-1, DA Form 3853-2, or DA Form 3853-3 for completeness and accuracy according to unit SOP and field manuals (FMs).
10. Forward all documents to the supervisor for review.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Ensured personnel are available and trained to perform the operation.	—	—
6. Inventoried the sampling and gauging kit for completeness according to the component list.	—	—
7. Checked petroleum products for water and sediment contamination according to unit tactical standing operating procedure (TSOP).	—	—
8. Controlled sampling and gauging operation, making on-the-spot corrections.	—	—
9. Verified DA Form 1804, DA Form 3853-1, DA Form 3853-2, or DA Form 3853-3 for completeness and accuracy.	—	—
10. Forwarded all documents to supervisor for review.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 1804  
 DA FORM 3853-1  
 DA FORM 3853-2  
 DA FORM 3853-3  
 DA PAM 710-2-2  
 FM 10-67-1  
 MIL-HDBK-1022A  
 MIL-STD-3004A

**Related**

AR 200-1  
 AR 710-2  
 FM 10-67-2  
 FM 3-100.12  
 FM 3-100.4  
 TM 10-6630-247-13&P

## Subject Area 6: SUPERVISING TANK VEHICLES

**Supervise Petroleum Tank Vehicles Operations****101-92F-2311**

**Conditions:** Given the requirement to supervise the loading and dispensing of petroleum products from tank vehicles in a field environment. Personnel and materials required to perform task: eight military occupational specialty (MOS)-qualified (92F) Soldiers; risk management procedures, applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE); 1,200-, 2,500-, and 5,000-gallon tank vehicles full or empty; Tank and Pump Unit (TPU); Refuel on the Move (ROM) kit/equipment; HEMTT Tanker Aviation Refueling System (HTARS) equipment; an operational Fuel System Supply Point (FSSP) or other fuel source; communication equipment, Movement Tracking System (MTS), spill containers; fire extinguishers; American Petroleum Institute (API) gravity equipment; a cup-case thermometer; appropriate gauging equipment (stick or other); gauge worksheets; rags; DA Form 3643 (Daily Issues of Petroleum Products); DD Form 1898 (Fuel Sale Slip); DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; unit standing operating procedure (SOP); oral or written operations order (OPORD); and full access to all reference materials.

**Standards:** Supervise loading and dispensing of products from assigned vehicles without contamination of products, pollution of the environment, damage to equipment, or injury to personnel.

**Performance Steps****DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

1. Apply risk management procedures.
    - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
    - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
  3. Ensure personnel read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
  4. Enforce wearing of appropriate PPE as required.
  5. Supervise before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to unit SOP and appropriate technical manuals (TMs). Ensure personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.
- NOTE: Ensure vehicle is dispatched properly by checking DD Form 1970 or DA Form 5987-E.
6. Supervise inventory of tanker vehicle. Ensure components are complete and serviceable prior to mission.

**Performance Steps**

7. Observe safety precautions.
  - a. Post NO SMOKING signs within 50 feet of the operation.
  - b. Position fire extinguishers within 5 to 10 feet of all hazardous equipment.
  - c. Ground and bond all equipment.
  - d. Protect yourself and others from fumes and vapors.
  - e. Use oil spill containers when connecting or disconnecting hoses.
  - f. Ensure tank vehicles are properly positioned for loading and unloading operations.
    - (1) Maintain 25 feet between tank vehicles.
    - (2) Park vehicles on level ground.
    - (3) Ensure wheels are chocked and that parking brakes are set on tank vehicles.
    - (4) Ensure that vehicles are facing the nearest exit.
    - (5) Ensure that vehicles are not blocking exit routes.
  - g. Ensure that manhole covers are open during all loading, unloading, and fuel serving operations.
8. Observe product for color, clarity, and contamination in accordance with FM 10-67-1 and MIL-HDBK-200.
  - a. Visual examination.
  - b. API gravity test.

NOTE: For aircraft refueling, perform Aqua-Glo and millipore test prior to distributing product.

9. Supervise loading and dispensing operations from tank vehicles.
  - a. Ensure equipment is functioning properly.
  - b. Ensure personnel are performing tasks properly.
  - c. Ensure fuel is accounted for on DA Form 3643 or DD Form 1898.
  - d. Monitor site for safety violations and environmental compliance.

**WARNING**

**Stop operations immediately for safety or environmental infractions.**

- e. Ensure personnel maintain status of product on hand in MTS as required by OPORD.
10. Maintain communication (MTS) with higher HQ at all times. Provide reports as required by OPORD and unit SOP.
11. Maintain records for accountability of petroleum products according to OPORD and unit SOP. Provide to supervisor upon completion of shift.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	_____	_____
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	_____	_____
3. Ensured personnel read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	_____	_____
4. Enforced wearing of appropriate PPE as required.	_____	_____
5. Supervised before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate TMs. Ensured personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	_____	_____

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
6. Supervised inventory of tanker vehicle.	_____	_____
7. Observed safety precautions.	_____	_____
8. Observed product for color, clarity, and contamination in accordance with FM 10-67-1 and MIL-HDBK-200.	_____	_____
9. Supervised loading and dispensing operations from tank vehicles.	_____	_____
10. Maintained communication (MTS) with higher HQ at all times. Provided reports as required by OPORD and unit SOP.	_____	_____
11. Maintained records for accountability of petroleum products according to OPORD and unit SOP. Provided to supervisor upon completion of shift.	_____	_____

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

### References

#### Required

DA FORM 2404  
 DA FORM 3643  
 DA FORM 5987-E  
 DA FORM 5988-E  
 DD FORM 1970  
 DD FORM 1898  
 FM 10-67-1  
 TB 11-5825-291-10-2  
 TM 10-4930-204-13  
 TM 10-4930-236-13&P  
 TM 11-5825-291-13  
 TM 5-4930-237-10  
 TM 9-2320-279-10-1  
 TM 9-2330-272-14  
 TM 9-2330-356-14  
 TM 9-2330-398-10

#### Related

DA PAM 750-8  
 FM 3-100.12  
 FM 3-100.4  
 MIL-HDBK-200

**Supervise Petroleum Rail Tank Cars Operations****101-92F-2405**

**Conditions:** Given the requirement to supervise loading and unloading of petroleum products from rail tank cars in a field environment. Personnel and materials required to perform mission: four military occupational specialty (MOS)-qualified (92F) Soldiers; rail tank car, loading facility, pump, fire extinguishers, spill kit/containers, risk management procedures, applicable Material Safety Data Sheets (MSDS), Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP) (if required), personal protective equipment (PPE), unit standing operating procedure (SOP), and full access to all applicable reference materials.

**Standards:** Supervise the loading and unloading of petroleum rail tank cars without injury to personnel, damage to equipment, or pollution of the environment.

**Performance Steps****DANGER**

**DO NOT PERFORM THIS TASK DURING ELECTRICAL STORMS. FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

**CAUTION**

Before performing this task read and comply with the appropriate MSDS.

NOTE: In this task, as with any task involving extensive handling of petroleum products, make sure that equipment is on hand to contain and clean up spills. Unpack, inspect, and position the equipment for convenient access before beginning the task. Review the requirements before performing the task to ensure that drip pans and waste fuel containers are the appropriate size to contain waste fuel generated by the task. Use drip pans at any point that a spill is likely to occur (valves or nozzles). Continually observe equipment and take care while performing the task to minimize the possibility of petroleum spills. If a spill occurs, immediately stop operations and take steps to stop, contain, and clean up the spill. Report all spills immediately to your supervisor.

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
3. Ensure personnel read and understand unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Enforce wearing of appropriate PPE as required.
5. Observe and enforce safety precautions when loading and unloading rail tank cars according to unit SOPs and FM 10-67-1.
  - a. Place NO SMOKING signs within 100 feet of transfer operations.

**Performance Steps**

- b. Do not allow any welding, open flames, or lights (other than explosion-proof flashlights or lanterns) within 100 feet of transfer operations.
- c. Do not allow anyone to carry matches, lighters, or open lights within transfer operations.
- d. Prior to each operation (loading and unloading) ensure that all equipment is bonded and grounded correctly.

6. Supervise preliminary procedures for loading and unloading rail tank car according to unit SOPs and FM 10-67-1.

- a. Implement preventive maintenance checks and services (PMCS) on loading equipment (such as pumps, hoses, pipeline, and manifolds).

NOTE: Ensure pumping unit is at least 50 feet from rail tank car.

- b. Make sure track rails are properly bonded and grounded. Ensure that cable connections are secure and make bare metal-to-metal contact.

NOTE: If there is no permanent ground rod, drive a 4- to 5-foot iron rod into the ground beside the tank car. Attach a ground wire between the tank car and the rod. Soak the ground around the rod with water.

- c. Make sure tank car is in position so that there is no unnecessary strain on hose connections.
- d. Inspect rail tank car to ensure it is free of contamination and in good operating condition.
- e. If other cars will be using site, ensure attachment for derauling is attached at head of siding or bypass to prevent other cars from backing into rail tank car during transfer operations.
- f. Inspect all grounds and bonds to ensure that they are secure and make a bare metal-to-metal contact.
- g. Make sure that at least two fire extinguishers are near rail tank car within easy reach of operators.
- h. Inspect all hoses and fittings to be used in operation for serviceability. Replace any hose and fittings which have potential to cause a leak.
- i. Make sure that tank car brakes are set and wheels are blocked.
- j. Make sure signs are in place (STOP--TANK CAR CONNECTED). Make sure they can be seen by switch crews on main line next to spur track.
- k. Ensure there is a wooden cone-shaped stopper on hand to plug bottom outlet of tank cars in an emergency.
- l. Make sure that if a tank car manifold is used, that it is bonded to tank car shell.
- m. Make sure awaiting rail cars are in position with like products together (all MOGAS together, all JP-8 fuel together, and all aviation fuel together).
- n. Make sure NO SMOKING signs are in area where they can be easily seen.
- o. Make sure there are two operational radios on hand during operations (one for pump operator and one for operators on tank car filling point).

7. Perform visual inspection of product prior to loading and unloading operations according to unit SOPs, DA Pamphlet 710-2-2, FM 10-67-1, and MIL-STD-3004A.

NOTE: Ensure product is clean, bright, and free of all contamination. Send sample to laboratory for analysis.

- a. Ensure personnel gauge and sample contents of tank according to FM 10-67-1, MIL-STD-3004A, and DA Pamphlet 710-2-2.
- b. Ensure there recording data accurately.
- c. Maintain data provide to your supervisor.

8. Supervise loading and unloading procedures according to unit SOP and FM 10-67-1.

- a. Check delivery schedule for receipt of product.
- b. When unloading, visually compare rail car numbers and seal numbers against rail car and seal numbers annotated on shipping document.
- c. When unloading, visually check seals for tampering or breakage.
- d. When unloading, record any signs of tampering or damage to equipment on shipping documents. Notify your supervisor immediately of all shortcomings and corrective actions to be taken.

**Performance Steps**

<p><b>WARNING</b></p> <p><b>Stop operations immediately for safety or environmental infractions.</b></p>
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9. Supervise operations after loading and unloading procedures according to unit SOPs and FM 10-67-1.

**Loading:**

- a. Ensure that product stands for 15 minutes prior to gauging.
- b. Ensure personnel gauge and sample contents of tank according to FM 10-67-1, MIL-STD-3004A, and DA Pamphlet 710-2-2. Ensure personnel are recording data accurately.
- c. Keep a sample of product for reference until tank is delivered.
- d. Drain any water or sediment from tank.
- e. Compare amount of product issued from storage tanks with amount loaded on tank cars after daily closing gauges are taken.
- f. Report excessive loss to your supervisor.
- g. Place identification seals on hatch of dome cover and record seal marking on shipping papers.
- h. Remove any DANGEROUS-EMPTY signs, and replace them with FLAMMABLE signs.
- i. Remove rail tank car from transfer area.

**Unloading:**

- j. Check to ensure that tank car is completely empty.
- k. Ensure personnel gauge and sample contents in receiving tanks according to FM 10-67-1, MIL-STD-3004A, and DA Pamphlet 710-2-2. Ensure personnel are recording data accurately.

**NOTE:** Personnel shall wait a minimum of thirty (30) minutes after receipt of any type of fuel, to allow electrostatic charges to dissipate before gauging.

- l. Compare amount of product delivered to receiving tank with amount of product taken from tank car.
- m. Report excessive loss to supervisor.
- n. Remove FLAMMABLE signs, and replace with DANGEROUS-EMPTY signs.
- o. Remove rail tank car from transfer area.
- p. Notify your supervisor that tank car is empty.
- q. Report any defective car to your supervisor.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Observed and enforced safety precautions when loading and unloading rail tank cars according to unit SOPs and FM 10-67-1.	—	—



<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
6. Supervised preliminary procedures for loading and unloading rail tank car according to unit SOPs and FM 10-67-1.	—	—
7. Performed visual inspection of product prior to loading and unloading operations according to unit SOPs, DA Pamphlet 710-2-2, FM 10-67-1, and MIL-STD-3004A.	—	—
8. Supervised loading and unloading procedures according to unit SOP and FM 10-67-1.	—	—
9. Supervised operations after loading and unloading procedures according to unit SOPs and FM 10-67-1.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

#### References

##### Required

DA PAM 710-2-2  
 FM 10-67-1  
 TM 10-4320-343-14

##### Related

FM 3-100.12  
 FM 3-100.4  
 MIL-HDBK-1022A  
 MIL-HDBK-201  
 MIL-STD-3004A  
 TM 10-4930-247-13&P

## Supervise Pump and Filter Separator Operations

### 101-92F-2406

**Conditions:** Given the requirement to supervise the operation of petroleum pumps and filters in a field environment. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers: 50-gallons per minute (GPM), 100-GPM, 220-GPM, and 350-GPM pumps and filter separators; a fuel source; fire extinguishers; rags; spill containers; risk management procedures, Material Safety Data Sheet (MSDS), personal protective equipment (PPE); containment and cleanup equipment; Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy, unit standing operating procedure (SOP); oral or written operations order (OPORD), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)), and full access to all reference materials.

**Standards:** Supervise the operation and maintenance on pumps and filter separators without injury to personnel, damage to equipment, or pollution of the environment.

#### Performance Steps

### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

1. Apply risk management procedures.
    - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
    - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
  3. Ensure personnel read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
  4. Enforce wearing of appropriate PPE as required.
  5. Supervise before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to unit SOP and appropriate technical manuals (TMs). Ensure personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.
  6. Inspect filter separators.
    - a. Check performance of all filter separators, regardless of product in service, every 30 days by submitting samples to a designated laboratory.
    - b. Check date when filters were in placed.
- NOTE: The month and year that filter was installed is required to be stenciled on top of filter separator.
7. Ensure correct procedures are being followed when starting pumps according to appropriate TMs.
  8. Monitor operations and make on-the-spot corrections as necessary.

**Performance Steps**

9. Ensure correct procedures are being used when shutting down pumps according to appropriate TMs.
10. Forward completed form (DA Form 2404 or DA Form 5988-E) to supervisor for review.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Supervised before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to unit SOP and appropriate technical manuals (TMs). Ensured personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	—	—
6. Inspected filter separators.	—	—
7. Ensured correct procedures are being followed when starting pumps according to appropriate TMs.	—	—
8. Monitored operations and made on-the-spot corrections as necessary.	—	—
9. Ensured correct procedures are being used when shutting down pumps according to appropriate TMs.	—	—
10. Forwarded completed form (DA Form 2404 or DA Form 5988-E) to supervisor for review.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References****Required**

DA FORM 2404  
 DA FORM 5988-E  
 FM 10-67-1  
 TM 10-4320-310-14  
 TM 10-4320-351-14  
 TM 10-4330-237-13&P  
 TM 10-4930-229-12&P  
 TM 10-4930-236-13&P  
 TM 10-4930-250-13&P  
 TM 5-4330-217-12

**Related**

DA PAM 750-8  
 FM 3-100.12  
 FM 3-100.4

## Supervise Refuel on the Move (ROM) Operations

101-92F-2407

**Conditions:** Given the requirement to supervise fueling operations in a field environment. Personnel and materials required to perform task: nine military occupational specialty (MOS)-qualified (92F) Soldiers; ROM kit, 5,000-gallon tank semi-trailer, fuel source, 550-foot-long by 150-foot-wide area, a spill contingency kit, risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE), Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; unit hazardous waste/hazardous material (HW/HM) management policy; unit standing operating procedure (SOP); oral or written operations order (OPORD); DA Form 3643 (Daily Issues of Petroleum Products), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)), and full access to all reference materials. The area is secure, no enemy contact is expected, and vehicles to be refueled are on hand.

**NOTE:** This task is NOT performed when electrical storms are within a 3-mile radius of the area of operations.

**Standards:** Supervise ROM operations ensuring safety, fuel accountability, and customer support are provided without damage to equipment or injury to personnel or damage to the environment.

### Performance Steps

#### **DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

#### **WARNING**

**Due to safety considerations, normal vehicle refueling is done with the engine off. AR 385-55 states that commanders will apply all normal safety standards to their operations unless it is necessary to change due to the mission. In training situations, changes may be authorized only by the commander. Commanders will evaluate the significance of the assumed risk versus the training benefit. In combat operations, commanders will make decisions based on Mission, Enemy, Terrain, Troops and Time Available, Civil Considerations (METT-TC) and risk analysis.**

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
3. Ensure personnel read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.

**Performance Steps**

4. Enforce wearing of appropriate PPE as required.
  5. Supervise before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to unit SOP and appropriate technical manuals (TMs). Ensure personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.
  6. Clear ground of brush saplings and debris (rocks, sticks, and trash).
  7. Supervise inventory of ROM equipment.
    - a. Ensure all equipment required to accomplish mission is on hand such as:
      - (1) ROM kit.
      - (2) Fire extinguishers for vehicle and each distributing point.
      - (3) Spill contingency kit, as a minimum, absorbents, shovels, and containers.
      - (4) Appropriate PPE for each distributing point.
      - (5) NO SMOKING signs.
      - (6) Water containers (5 gallon) for each distributing point.
      - (7) Appropriate drip pans for each distributing point.
      - (8) Communications for controlling signals such as: flags, chemical light or flashlights, and radios.
    - b. Check serviceability of components according to TM 5-4930-237-10.
      - (1) Check hoses for dry rot, bulges, and gaskets.
      - (2) Check nozzle screens for sediment.
      - (3) Check tanker pump to ensure it is operational.
      - (4) Check fire extinguishers to ensure the appropriate for mission.
  8. Assign specific duties to personnel.
    - a. Pump operators.
    - b. Nozzle operators.
    - c. Ground guides.
  9. Supervise assembly of ROM kit according to OPORD and unit SOP.
    - a. Ensure fire extinguishers are placed at each refueling point and source of fuel (but not so close that they cannot be reached in event of a fire).
    - b. Ensure drip pans are placed at each refueling point and fuel source.
    - c. Ensure NO SMOKING signs are posted.
    - d. Ensure there is a 5 gallon can of water at each refueling point for any emergency.
  10. Supervise ROM operation according to unit SOP, FM 10-67-1, and appropriate TMs.
    - a. Implement PMCS on ROM and support equipment (such as pumps, hoses, and nozzles).
- NOTE: Ensure all deficiencies are annotated on DA Form 2404 or DA Form 5988-E.
- b. Ensure personnel are familiar and equipped with operational control signals (flags, lights, and radio) to be used.
  - c. Ensure vehicles safely enter and move through ROM site and receive prescribed amount/time of fuel.
  - d. Enforce grounding and bonding procedures for fuel semi-trailers, pumps, filter separators, and each refueling point.
  - e. Ensure appropriate PPE is on hand and worn by personnel filling vehicles (for example, standard combat uniform, hearing protection, goggles, and gloves).
  - f. Ensure personnel are ready to handle nozzles for refueling vehicles when convoy personnel (assistant driver or commander) are not available.
  - g. Observe site for safety and environmental infractions. Shut down operations immediately if infractions are detected and correct them.
  - h. Ensure personnel account for issue of product in accordance with OPORD and unit SOP.

**Performance Steps**

11. Maintain communication with higher HQ at all times and provide reports as required by OPORD and unit SOP.
12. Supervise disassembly of ROM equipment according to unit SOP, FM 10-67-1, and appropriate TMs.
13. Maintain records for accountability of petroleum products according to OPORD and unit SOP. Provide to supervisor upon completion of ROM operations.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Supervised before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate TMs. Ensured personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	—	—
6. Cleared ground of brush saplings and debris (rocks, sticks, and trash).	—	—
7. Supervised inventory of ROM equipment.	—	—
8. Assigned specific duties to personnel.	—	—
9. Supervised assembly of ROM kit according to OPORD and unit SOP.	—	—
10. Supervised ROM operation according to unit SOP, FM 10-67-1, and appropriate TMs.	—	—
11. Maintained communication with higher HQ at all times and provided reports as required by OPORD and unit SOP.	—	—
12. Supervised disassembly of ROM equipment according to unit SOP, FM 10-67-1, and appropriate TMs.	—	—
13. Maintained records for accountability of petroleum products according to OPORD and unit SOP. Provided to supervisor upon completion of ROM operations.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
DA FORM 3643  
DA FORM 5988-E  
DA PAM 710-2-2  
FM 10-67-1  
TM 9-2330-330-14&P

**Related**

FM 10-1  
FM 3-100.12  
FM 3-100.4

## Supervise Petroleum Waterborne Operations

101-92F-2408

**Conditions:** Given the requirement to supervise water front fueling operations in a field environment. Personnel and materials required to perform task: three military occupational specialty (MOS)-qualified (92F) Soldiers; fire fighting equipment, waterborne barges or tankers, communication equipment, weighted copper beaker, sample cans/bottle, drip pans, absorbent containers, floating booms, chemical dispersants, skimming boats, risk management procedures, applicable Material Safety Data Sheets (MSDS), Facility Response Plan (FRP), personal protective equipment (PPE), unit standing operating procedure (SOP), and full access to all reference material.

**Standards:** Supervise loading and unloading of waterborne barges and tankers, fuel accountability, and quality surveillance without injury to personnel, damage to equipment, or pollution of the environment.

### Performance Steps

#### DANGER

**DO NOT PERFORM THIS TASK DURING ELECTRICAL STORMS. FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

1. Apply risk management procedures.
    - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
    - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
  3. Ensure personnel read and understand unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
  4. Enforce wearing of appropriate PPE as required.
  5. Review OPORD for loading and unloading procedures.
  6. Verify that vessels from foreign ports have been inspected and are cleared for boarding by customs and health authorities.
  7. Inspect vessel for proper mooring.
  8. Inspect all connecting hoses for condition and suitability.
- NOTE: There should be enough hose to allow for slack or to take care of tide changes, weather, or layout. Too much hose may slow down product flow.
9. When loading vessels, supervise personnel installing seals. When unloading vessels, supervise personnel inspecting seals for tampering.
    - a. Broken seals.
    - b. Different seal numbers annotated on shipping documents.
  10. Verify and match seal numbers with seal numbers on shipping documents.
  11. Supervise inspection, sampling, and gauging of vessel's tanks.



**Performance Steps**

- 12. Supervise start of loading or unloading operations.
- 13. Supervise stopping of loading or unloading operations.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Reviewed OPORD for loading and unloading procedures.	—	—
6. Verified that vessels from foreign ports have been inspected and are cleared for boarding by customs and health authorities.	—	—
7. Inspected vessel for proper mooring.	—	—
8. Inspected all connecting hoses for condition and suitability.	—	—
9. Supervised personnel installing seals when loading vessels. Supervised personnel inspecting seals for tampering when unloading vessels.	—	—
10. Sealed numbers with shipping documents.	—	—
11. Supervised inspection, sampling, and gauging of vessel's tanks.	—	—
12. Supervised start of loading or unloading operations.	—	—
13. Supervised stopping of loading or unloading operations.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DOD 4140.25-M  
FM 10-67-1

**Related**

AR 200-1  
AR 710-2  
DA PAM 710-2-2  
FM 3-100.12  
FM 3-100.4  
MIL-STD-3004A

## Supervise HEMTT Tanker Aviation Refueling System (HTARS) Operations

101-92F-2413

**Conditions:** Given the requirement to provide aviation refueling support on a fixed airstrip or pre-designated field location. Personnel and materials required to perform task: five military occupational specialty (MOS)-qualified (92F) Soldiers; one MOS 93H or pathfinder personnel that have required Air Traffic Control (ATC) skills; risk management procedures, Heavy Extended Mobility Tactical Truck (HEMTT) tanker, HEMTT Tanker Aviation Refueling System (HTARS), communication equipment, fire extinguishers, spill containers/clean-up materials, personal protective equipment (PPE), appropriate Material Safety Data Sheet (MSDS) or Hazardous Material Information Sheet (HMIS), communication equipment; Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP) (if required); the unit hazardous waste/hazardous material (HWHM) management policy; unit standing operating procedure (SOP) on aviation refueling operations; oral or written operations order (OPORD); DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)); DA Form 3643 (Daily Issues of Petroleum Products), and full access to all applicable reference material.

**Standards:** Supervise the layout, assembly, operator's preventive maintenance checks and services (PMCS) operation, fuel quality surveillance and accountability, and disassembling of the HTARS without injury to personnel, damage to equipment or to the environment.

### Performance Steps

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
3. Ensure personnel read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Enforce wearing of appropriate PPE as required.
5. Supervise before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate technical manuals (TMs). Ensure personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.
6. Supervise placement of tank vehicle.
  - a. When positioning vehicle, remember to lay out system so that helicopter can land and refuel into head wind or crosswind. Avoid laying out system so that helicopters land and take off in tail winds.
  - b. Choose highest ground possible on a given site so that vapors will not collect, bearing in mind that you should also use as much natural camouflage as possible.
  - c. Avoid laying out near bodies of water to avoid contamination.
  - d. Position vehicle for ease of exit from site. Do not block exit routes.
  - e. Position vehicle on level ground.
  - f. Maintain at least 25 feet between tank vehicles during all loading, unloading, and fuel servicing operations.
  - g. Ensure wheels are chock and parking brakes are set on vehicle.
  - h. Ensure manhole cover is open during all loading, unloading, and fuel servicing operations.
  - i. Ensure that NO SMOKING signs are posted and position fire extinguishers within easy reach.
  - j. Check grounding and bonding vehicle.

**Performance Steps**

7. Supervise inventory of HTARS system. Ensure components are complete and serviceable prior to mission.
8. Supervise assembly of HTARS components and ensure system is set up according to OPORD and TM 5-4930-237-10.
  - a. Ensure grounding and bonding of fuel tanker and each refueling point.
  - b. Post NO SMOKING, DANGER, PASSENGER MARSHALING AREA, and EMERGENCY SHUTOFF signs.
  - c. Ensure drip pans are placed at each refueling point and fuel source.
  - d. Ensure fire extinguishers are at each refueling point and HEMTT (but not so close that they cannot be reached in an event of a fire).
  - e. Ensure there is a 5-gallon can of water at each refueling point for any emergency.
  - f. Clear ground of all sticks, stones, and debris to prevent them from being sucked up or transformed into dangerous projectiles by the rotor wash.
  - g. Ensure immediate refueling area, paths of approach, and hover lanes are cleared before operations.
9. Ensure recirculation of fuel prior to servicing aircraft.
  - a. Inspect discharge hoses and coupling for leaks.
  - b. Draw a sample of fuel from each nozzle keep visual on hand.
10. Ensure Aqua-Glo and millipore tests are conducted, record results and provide to supervisor.  
NOTE: Aqua-Glo is conducted daily and millipore is conducted monthly.
11. Supervise dispensing operation according to OPORD, unit SOPs, and field manuals/technical manuals (FM/TMs).
  - a. Ensure appropriate PPE is worn.
  - b. Ensure soldier manning the nozzle guides aircraft into position using proper hand and arm signals according to FM 10-67-1.

**CAUTION**

Ensure pilot has armaments on safe prior to soldier guiding aircraft in for refueling.

- c. Brief passengers on proper dismounting/mounting procedures and acquaint them with the marshalling area.
  - d. Ensure passengers go to marshaling area during refueling operation.
- NOTE: Crew members, except pilot or copilot who may remain at controls if necessary, should deplane and assist with refueling or man fire extinguisher.
- e. Ensure pilot notifies his/her commander that he/she will be off the air during refueling.
  - f. Ensure all radios are turned off except radio used to monitor air traffic.
  - g. Ensure bonding of aircraft.
  - h. Ensure personnel account for issue of product in accordance with OPORD and unit SOP.
12. Supervise shut down and de-fueling of HTARS.
  13. Ensure components are properly stored.
  14. Maintain records for accountability of product according to OPORD and unit SOP. Provide to supervisor upon completion of HTARS operations.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Supervised before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate TMs. Ensured personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	—	—
6. Supervised placement of tank vehicle.	—	—
7. Supervised inventory of HTARS system.	—	—
8. Supervised assembly of HTARS components and ensured system set up according to OPORD and TM 5-4930-237-10.	—	—
9. Ensured recirculation of fuel prior to servicing aircraft.	—	—
10. Conducted Aqua-Glo and millipore tests recorded results and provided to supervisor.	—	—
11. Supervised dispensing operation according to OPORD, unit SOPs, and FM/TMs.	—	—
12. Supervised shut down and de-fueling of HTARS.	—	—
13. Ensured components are properly stored.	—	—
14. Maintained records for accountability of product according to OPORD and unit SOP. Provided to supervisor upon completion of HTARS operations.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 2404
- DA FORM 3643
- DA FORM 5987-E
- DA FORM 5988-E
- DD FORM 1970
- FM 10-67-1
- FM 3-04.111
- TM 5-4930-237-10
- TM 9-2320-279-10-1

**Related**

- DA PAM 710-2-2
- DA PAM 750-8
- FM 3-100.12
- FM 3-100.4

## Subject Area 7: SUPERVISING CLASS III OPERATIONS

**Supervise Load Handling System (LHS) Modular Fuel Farm (LMFF) Operations****101-92F-2503**

**Conditions:** Given the requirement to supervise fueling operations in a field environment. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers; LMFF, Load Handling System/Palletized Loading System (LHS/PLS) trucks to haul/download equipment and personnel, risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE), communications equipment, fuel source, fire extinguishers, spill kit/containment and clean up equipment, Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP) (if required), written or oral operations order (OPORD), unit standing operating procedure (SOP), DA Form 3643 (Daily Issues of Petroleum Products), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)), DD Form 1898 (Fuel Sale Slip), and full access to all reference materials.

**Standards:** Supervise the assembly, operator's preventive maintenance checks and services (PMCS), operation, and disassembly of the LHS/PLS Modular Fuel Farm without damage to equipment, injury to personnel, or pollution to the environment. Maintain communications equipment and required records.

**Performance Steps**

NOTE: In this task, as in many tasks involving extensive handling petroleum product, make sure the proper equipment is on hand to contain and clean up any spills. Supervise the unpacking, inspecting, and positioning of the equipment before the task begins. Brief the Soldiers on the task at hand and ensure that they understand the task at hand.

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
3. Ensure personnel read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Enforce wearing of appropriate PPE as required.
5. Supervise before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate technical manuals (TMs). Ensure personnel record faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.
6. Supervise inventory of LMFF. Ensure components are complete and serviceable prior to mission.
7. Enter communications nets and conduct communications checks in accordance with current communications instructions and unit SOP.
8. Supervise positioning of LMFF.
  - a. Ensure ground guides are in place while placing fuel tank and pump.
  - b. Ensure tanks and pump unit are positioned on reasonably level ground.
  - c. Ensure pumping unit and fuel tanks are grounded.
  - d. Ensure fire extinguishers are in place and serviceable.

**Performance Steps**

- 9. Supervise assembling of LMFF according to OPORD and unit SOP.  
 NOTE: Ensure pump pressure gauges are observed during operations, Ensure personnel know the location of the THREE EMERGENCY SHUTDOWN SWITCHES IN CASE OF AN EMEGENCY.
  - a. Observe safety precautions.
    - (1) Post NO SMOKING signs within 50 feet of operation.
    - (2) Position fire extinguishers within 5 to 10 feet of all hazardous equipment.
    - (3) Ground and bond all equipment.
    - (4) Protect yourself and others from fumes and vapors.
    - (5) Use oil spill containers when connecting or disconnecting hoses.
    - (6) Check to ensure that 5-gallon water containers are at each dispensing point.
  - b. Observe product for color, clarity, and contamination.
    - (1) Visual examination.
    - (2) API gravity test.
- 10. Supervise operation procedures according to OPORD and unit SOP.
  - a. Ensure equipment is functioning properly.
  - b. Ensure personnel are performing tasks properly.
  - c. Ensure personnel account for issue and received of product by completing DA Form 3643 or DD Form 1898, in accordance with OPORD and unit SOP.
  - d. Monitor site for safety violations and environmental compliance.

**WARNING**

**Stop operations immediately for safety or environmental infractions.**

- 11. Supervise disassembly of LMFF.
- 12. Maintain records for accountability of product according to OPORD and unit SOP. Provide to supervisor upon completion of LMFF operations.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Supervised before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate TMs. Ensured personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	—	—
6. Supervised inventory of LMFF.	—	—
7. Entered communications nets and conducted communications checks in accordance with current communications instructions and unit SOP.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
8. Supervised positioning of LMFF.	—	—
9. Supervised assembling of LMFF according to OPORD and unit SOP.	—	—
10. Supervised operation procedures according to OPORD and unit SOP.	—	—
11. Supervised disassembly of LMFF.	—	—
12. Maintained records for accountability of product according to OPORD and unit SOP. Provided to supervisor upon completion of LMFF operations.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
 DA FORM 3643  
 DA FORM 5988-E  
 DD FORM 1898  
 FM 10-67-1  
 FM 3-100.12  
 TM 10-4930-247-13&P  
 TM 5-4930-237-10

**Related**

AR 200-1  
 DA PAM 750-8  
 FM 3-100.4

## Supervise Fuel System Supply Point (FSSP) Operations

101-92F-2158

**Conditions:** Given the requirement to store and issue bulk petroleum at a Class III supply point in a field environment. Personnel and materials required to perform task: seven military occupational specialty (MOS)-qualified (92F) Soldiers; risk management procedures, a complete FSSP, personal protective equipment (PPE), 5-ton cargo trailer, prefabricated support, trucks to haul equipment and fuel source, a rough-terrain forklift with operator, fire extinguishers, communication equipment, spill kit/containment and cleanup equipment, Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, applicable Material Safety Data Sheets (MSDS), the unit hazardous waste/hazardous material (HW/HM) management policy, an oral or written operations order (OPORD), unit standing operating procedure (SOP), site sketch, DA Form 2765-1 (Request for Issue or Turn-In), DA Form 3643 (Daily Issues of Petroleum Products), DD Form 1348-1A (Issue Release/Receipt Document), DA Form 1804 (Petroleum Sample), DD Form 250 (Materiel Inspection Receiving Report), DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)), and DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)), DD Form 1898 (Fuel Sale Slip), and full access to all applicable reference materials.

**Standards:** Supervise the assembly, operation, operator's preventive maintenance checks and services (PMCS), fuel accountability, quality surveillance, and disassembly of the FSSP, ensuring the system can be operated without commingling products, injury to personnel, damage to equipment, or pollution of the environment.

### Performance Steps

#### **DANGER**

**DO NOT PERFORM THIS TASK DURING ELECTRICAL STORMS. FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
3. Ensure personnel read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Enforce wearing of appropriate PPE as required.
5. Review site sketch and coordinate any changes with Section Sergeant.
6. Supervise loading and unloading of FSSP.
  - a. Ensure packing of FSSP is in accordance with load plan provided by Section Sergeant.
  - b. Provide load plans to supervisor on DA Form 7598 (Vehicle Load Card).
  - c. Report any problems with the load plan to your supervisor.
  - d. Ensure forklift operator is trained and licensed.
  - e. Ensure vehicle and equipment is positioned/placed in area that will not hinder movement.



**Performance Steps**

7. Supervise site preparation.
  - a. Ensure area is cleaned of any debris that may puncture a collapsible tank.
  - b. Ensure filter separator and pump areas are clear of grass, trash, and leaves.
8. Supervise inventory of FSSP system. Ensure components are complete and serviceable prior to mission.
9. Supervise layout of FSSP according to site sketch, OPORD, and unit tactical standing operating procedure (TSOP).
  - a. Ensure components are positioned on reasonably level ground.
  - b. Check that low lying areas are avoided so that vapors do not collect.
  - c. Ensure there is adequate cover and concealment from enemy observation.
  - d. Ensure plunges and caps remain on components until connection is made.
10. Supervise before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate technical manuals (TMs). Ensure personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.
  - a. Ensure pumps and filter separators are operational in accordance with appropriate TMs.
  - b. Check collapsible tanks and drums for cuts, tears, and holes.
  - c. Ensure hose has no dry rot or bulges.
11. Supervise receiving and issuing of product from FSSP system according to OPORD and unit SOP.
 

NOTE: Ensure correct valves are open to direct flow of fuel prior to operations.

  - a. Monitor site for safety violations and environmental compliance.
    - (1) Enforce grounding and bonding procedures for tanker and each refueling point.
    - (2) Ensure appropriate PPE is worn.
    - (3) Ensure fire extinguishers are at each refueling point and source of fuel.
    - (4) Ensure drip pans are in place at each refueling point and fuel source.
    - (5) Ensure NO SMOKING signs are posted.
    - (6) Ensure there are 5-gallon water containers at each refueling point and each fuel source.
    - (7) Ensure that there is no flame-producing material within 100 feet of the FSSP.
    - (8) Ensure that engines are off on vehicles when refueling.
  - b. Check product prior to receipt.
  - c. Gauge tankers prior to receiving product.
  - d. Ensure correct valves are open within FSSP manifold system prior to receipt of product.
  - e. Ensure correct valves are open on transport prior to issuing product.
  - f. Ensure personnel account for issue and received of product by completing DA Form 3643 or DA Form 2765-1, in accordance with OPORD and unit SOP.

NOTE: There are a variety of forms that can be used at the bulk fuel distributing point for accountability of products that you need to be familiarize with as a operator/supervisor they are as follows: DD Form 250, DA Form 2765-1, DA Form 1348-1A, DA Form 3644, and DD Form 1898. Information on filling out forms can be found in DA Pamphlet 710-2-1.

  - g. Maintain communication with higher HQ at all times and provide reports as required by OPORD and unit SOP.
  - h. Ensure quality surveillance procedures are performed according to unit SOP.
12. Supervise drainage and disassembly of FSSP.
13. Ensure all equipment is properly stored in containers provided.
14. Maintain records for accountability of petroleum products according to OPORD and unit SOP. Provide to supervisor upon completion of shift.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	_____	_____
2. Ensured environmental stewardship measures were followed according to critical task 101-92F-2401.	_____	_____
3. Ensured personnel read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	_____	_____
4. Enforced wearing of appropriate PPE as required.	_____	_____
5. Reviewed site sketch and coordinated any changes with Section Sergeant.	_____	_____
6. Supervised loading and unloading of FSSP.	_____	_____
7. Supervised site preparation.	_____	_____
8. Supervised inventory of FSSP system.	_____	_____
9. Supervised layout of FSSP according to OPORD and unit tactical standing operating procedure (TSOP).	_____	_____
10. Supervised before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate TMs. Ensured personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	_____	_____
11. Supervised receiving and issuing of product from FSSP system according to OPORD and unit SOP.	_____	_____
12. Supervised drainage and disassembly of FSSP.	_____	_____
13. Ensured all equipment is properly stored in containers provided.	_____	_____
14. Maintained records for accountability of petroleum products according to OPORD and unit SOP. Provided to supervisor upon completion of shift.	_____	_____

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 1804
- DA FORM 2404
- DA FORM 2765-1
- DA FORM 3643
- DA FORM 5987-E
- DA FORM 5988-E
- DA FORM 7598
- DD FORM 1348-1A
- DD FORM 1898
- DD FORM 1970
- DD FORM 250
- FM 10-67-1
- TM 10-4320-343-14
- TM 10-4930-232-12&P
- TM 5-4330-211-12
- TM 5-5430-210-12

**Related**

- DA PAM 710-2-1
- DA PAM 750-8
- FM 3-100.12
- FM 3-100.4

## Supervise Forward Area Refueling Equipment (FARE) Operations

**101-92F-2304**

**Conditions:** Given the requirement to provide aviation refueling support on a fixed airstrip or pre-designated field location. Personnel and material required to perform task: three military occupational specialty (MOS)-qualified (92F) Soldiers and one MOS 93H or pathfinder personnel that have required Air Traffic Control (ATC) skills; customer (aircraft with crew), proper on-specifications product, communication equipment, FARE system, fire extinguisher, spill kit/containers, aviation fuel contaminant test kit, millipore/Aqua-Glo test kit, two each 5 gallon water cans, appropriate personal protection equipment (PPE), risk management procedures, applicable Material Safety Data Sheets (MSDS), Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, the unit hazardous waste/hazardous material (HW/HM) management policy, Oil Discharge Contingency Plan (ODCP) (if required), oral or written operations order (OPORD), unit standing operating procedure (SOP) on aviation refueling operations, DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA), DA Form 3643 (Daily Issues of Petroleum Products), and full access to all reference material.

**Standards:** Supervise the assembly, operation, preventive maintenance checks and services (PMCS), and disassembly of the FARE, ensuring aircraft are refueled with the proper on-specification product without injury to personnel or damage to the equipment and surrounding area.

### Performance Steps

#### DANGER

**DO NOT PERFORM THIS TASK DURING ELECTRICAL STORMS. FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL. LAY OUT THE SYSTEM SO THAT THE HELICOPTER CAN LAND AND REFUEL INTO THE HEAD WIND OR CROSSWIND. AVOID LAYING OUT THE SYSTEM SO THAT HELICOPTERS LAND AND TAKEOFF IN TAIL WINDS.**

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
3. Ensure personnel read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Enforce wearing of appropriate PPE as required.
5. Supervise inventory of FARE system. Ensure components are complete and serviceable prior to mission.
6. Supervise assembly of FARE components and ensure system is set up according to OPORD and TM 10-4930-229-12&P.
  - a. Ensure grounding and bonding of pump, filter/separator, and each refueling point.

**Performance Steps**

- b. Post NO SMOKING, DANGER, PASSENGER MARSHALING AREA, and EMERGENCY SHUTOFF signs.
  - c. Ensure drip pans are placed at each refueling point and fuel source.
  - d. Ensure fire extinguishers are at each refueling point (but not so close that they cannot be reached in an event of a fire).
  - e. Ensure there is a 5-gallon can of water at each refueling point for any emergency.
  - f. Clear ground of all sticks, stones, and debris to prevent them from being sucked up or transformed into dangerous projectiles by the rotor wash.
  - g. Ensure immediate refueling area, paths of approach, and hover lanes are cleared before operations.
  - h. Mark refueling points with lighted beanbags or chemical lights for night time operations.
7. Supervise before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate TMs. Ensure personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.
8. Ensure Aqua-Glo and millipore tests record results and provide to supervisor.
9. Supervise dispensing operation according to OPORD, unit SOPs, field manuals (FMs), and technical manuals (TMs).
- a. Ensure appropriate PPE is worn.
  - b. Ensure soldier manning the nozzle guides aircraft into position using proper hand and arm signals according to FM 10-67-1.

**CAUTION**

Ensure pilot has armaments on safe, prior to Soldier guiding aircraft in for refueling.

- c. Brief passengers on proper dismounting and mounting procedures and acquaint them with the marshalling area.
  - d. Ensure passengers go to marshalling area during refueling operation.
- NOTE: Crew members, except pilot or copilot who may remain at controls if necessary, should deplane and assist with refueling or man fire extinguisher.
- e. Ensure pilot notifies his/her commander that he/she will be off the air during refueling.
  - f. Ensure all radios are turned off, except radio used to monitor air traffic.
  - g. Ensure bonding of aircraft.
  - h. Ensure personnel account for issue of product in accordance with OPORD and unit SOP.
10. Supervise the personnel camouflaging the location using natural material and unit camouflage equipment, if available according to unit SOP.
11. Supervise personnel disassembling the FARE according to unit SOP.
12. Ensure components are properly stored.
13. Maintain records for accountability of product according to OPORD and unit SOP. Provide to supervisor upon completion of shift.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Supervised inventory of FARE system.	—	—
6. Supervised assembly of FARE components and ensured was system set up according to OPORD and TM 10-4930-229-12&P.	—	—
7. Supervised before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate TMs. Ensure personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	—	—
8. Conducted Aqua-Glo and millipore tests record results and provided to supervisor.	—	—
9. Supervised dispensing operation according to OPORD, unit SOPs, FMs, and TMs.	—	—
10. Supervised the personnel camouflaging the location using natural material and unit camouflage equipment, if available according to unit SOP.	—	—
11. Supervised personnel disassembling the FARE according to unit SOP.	—	—
12. Ensured components are properly stored.	—	—
13. Maintained records for accountability of product according to OPORD and unit SOP. Provided to supervisor upon completion of shift.	—	—

**Evaluation Guidance:** Score the soldier GO if all performance measures are passed. Score the soldier NO-GO if any performance measures are failed. If the soldier scores a NO-GO, show what was done wrong and how to do it correctly.

#### References

##### Required

DA FORM 2404  
 DA FORM 3643  
 DA FORM 5830-R  
 DA FORM 5988-E  
 FM 10-67-1  
 FM 3-04.111  
 TM 10-4930-229-12&P  
 TM 10-8110-201-14&P  
 TM 5-4330-217-12  
 TM 5-6630-218-10

##### Related

AR 200-1  
 FM 3-100.12  
 FM 3-100.4

## Supervise Petroleum Assault Hoseline Operations

### 101-92F-2409

**Conditions:** Given the requirement to supervise fueling operations in a field environment. Personnel and materials required to perform task: thirteen military occupational specialty (MOS)-qualified (92F) Soldiers; spill kit/containment and clean up equipment, complete hose line system (which consists of 13,000 feet of 4-inch collapsible hose packed in flaking boxes (one each Tri-con container), 350-gallons per minute (GPM) pumping assembly, flow control kit, roadway crossing guard, hose line suspension kit, hose line assembly, hose line packing kit, and repair kit. Fire extinguishers, trucks, evacuation kit, air compressor (250 cubic feet per minute [CFM]), forklift 10,000-pounds, communication equipment, written or oral operations order (OPORD), unit standing operating procedure (SOP), risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE), Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP) (if required), DA Form 3643, DA Form 2404 or DA Form 5988-E, and full access to all applicable reference materials.

**Standards:** Supervise the layout, assembly, operator's preventive maintenance checks and services (PMCS), operation, and disassembly of the Assault Hoseline System (AHS) without damage to equipment, injury to personnel, or pollution to the environment.

#### Performance Steps

### **DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

1. Apply risk management procedures.
    - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
    - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
  3. Ensure personnel read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
  4. Enforce wearing of appropriate PPE as required.
  5. Supervise before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate technical manuals (TMs). Ensure personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.
  6. Conduct map/site recon and select a direct route which is free of obstacles.
  7. Enter communications nets and conduct communications checks in accordance with current communications instructions and company/battalion SOP.
  8. Supervise layout of assault hoseline.
- NOTE: The recommended speed to lay out the hose is 20 miles per hour (MPH).
- a. Ensure cover and concealment of vehicles, shelters, and equipment are employed.

**Performance Steps**

b. Report completion of set up to section chief.

9. Supervise operation of assault hoseline according to unit SOP and appropriate field manuals (FMs)/TMs.

NOTE: The 350-GPM pump is used with the assault hoseline.

10. Supervise evacuation of assault hoseline according to unit SOP and appropriate FMs/TMs.

NOTE: You cannot move the assault hoseline to a new location until you remove the fuel from the system and get all the vapors and air out so that the hose is flat and ready to pack.

11. Supervise retrieval and packing of assault hoseline according to unit SOP and appropriate FMs/TMs.

12. Maintain a written and/or digital record of daily issues for accountability according to unit SOP. Provide a daily accountability report to the Section Chief.

**Evaluation Preparation:** See task Conditions and Standards.

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
1. Applied risk management procedures.	___	___
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	___	___
3. Ensured personnel read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	___	___
4. Enforced wearing of appropriate PPE as required.	___	___
5. Supervised before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate TMs. Ensured personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	___	___
6. Conducted map/site recon and selected a direct route which is free of obstacles.	___	___
7. Entered communications nets and conducted communications checks in accordance with current communications instructions and company/battalion SOP.	___	___
8. Supervised layout of assault hoseline.	___	___
9. Supervised operation of assault hoseline according to unit SOP and appropriate FMs/TMs.	___	___
10. Supervised evacuation of assault hoseline according to unit SOP and appropriate FMs/TMs.	___	___
11. Supervised retrieval and packing of assault hoseline according to unit SOP and appropriate FMs/TMs.	___	___
12. Maintained a written and/or digital record of daily issues for accountability according to unit SOP. Provided a daily accountability report to the Section Chief.	___	___

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
DA FORM 3643  
DA FORM 5988-E  
FM 10-67-1  
TM 5-4310-452-14

**Related**

FM 3-100.12  
FM 3-100.4  
FM 5-482  
TM 10-4320-343-14



## Supervise Advanced Aviation Forward Area Refueling System (AAFARS) Operations

### 101-92F-2501

**Conditions:** Given the requirement to provide aviation refueling support on a fixed airstrip or pre-designated field location. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers and one MOS 93H or pathfinder personnel that have required Air Traffic Control (ATC) skills; customer (aircraft with crew), proper on-specifications product, communication equipment, AAFARS, fire extinguishers, spill kit/containers, personal protective equipment (PPE); risk management procedures, applicable Material Safety Data Sheets (MSDS); Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; unit standing operating procedure (SOP); oral or written operations order (OPORD); DA Form 3643 (Daily Issues of Petroleum Products), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); DD Form 1898 (Fuel Sale Slip); and full access to all reference material.

**Standards:** Supervise the assembly, operation, operator's preventive maintenance checks and services (PMCS), fuel accountability, quality surveillance, and disassembly of the AAFARS, ensuring aircraft are refueled with aviation and on grade fuel without injury to personnel or damage to the equipment and the surrounding area.

#### Performance Steps

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
3. Ensure personnel read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Enforce wearing of appropriate PPE as required.
5. Supervise inventory of AAFARS. Ensure components are complete and serviceable prior to mission.
6. Supervise assembly of AAFARS components and ensure system is set up according to OPORD and TM 10-4930-250-13&P.
  - a. Ensure grounding and bonding of pump, accessory, filter separator, and each refueling point.
  - b. Post NO SMOKING, DANGER, PASSENGER MARSHALING AREA, and EMERGENCY SHUTOFF signs.
  - c. Ensure drip pans are placed at each refueling point and fuel source.
  - d. Ensure fire extinguishers are at each refueling point (but close enough that they can be reached in an event of a fire).
  - e. Ensure there is a 5-gallon can of water at each refueling point for any emergency.
  - f. Clear ground of all sticks, stones, and debris to prevent them from being sucked up or transformed into dangerous projectiles by the rotor wash.
  - g. Ensure immediate refueling area, paths of approach, and hover lanes are cleared before operations.
  - h. Mark refueling points with lighted beanbags or chemical lights for night time operations.
7. Supervise before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate technical manuals (TMs). Ensure personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.

**Performance Steps**

- 8. Ensure recirculation of fuel prior to servicing aircraft.
  - a. Inspect discharge hoses and coupling for leaks.
  - b. Draw a sample of fuel from each nozzle.
- 9. Conduct Aqua-Glo and □illipore tests record results and provide to supervisor.
- 10. Supervise dispensing operation according to OPORD, unit SOPs, and field manuals/technical manuals (FM/TMs).
  - a. Ensure appropriate PPE is worn.
  - b. Ensure soldier manning the nozzle, guides aircraft into position using proper hand and arm signals according to FM 10-67-1.

**CAUTION**  
 Ensure pilot has armaments on safe prior to Soldier guiding aircraft in for refueling.

- c. Brief passengers on proper dismounting/mounting procedures and acquaint them with the marshalling area.
  - d. Ensure passengers go to marshaling area during refueling operation.
- NOTE: Crew members, except pilot or copilot who may remain at controls if necessary, should deplane and assist with refueling or man fire extinguisher.
- e. Ensure pilot notifies his/her commander that he/she will be off the air during refueling.
  - f. Ensure all radios are turned off except radio used to monitor air traffic.
  - g. Ensure bonding of aircraft.
  - h. Ensure personnel account for issue of product in accordance with OPORD and unit SOP.
- 11. Supervise shut down and de-fueling of AAFARS.
  - 12. Ensure components are properly stored.
  - 13. Maintain records for accountability of product according to OPORD and unit SOP. Provide to supervisor upon completion of AAFARS operations.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Supervised inventory of AAFARS.	—	—
6. Supervised assembly of AAFARS components and ensured system was set up according to OPORD and TM 10-4930-250-13&P.	—	—
7. Supervised before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate TMs. Ensured personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
8. Ensured recirculation of fuel prior to servicing aircraft.	—	—
9. Ensured Aqua-Glo and Millipore tests were conducted, recorded results and provided to supervisor.	—	—
10. Supervised dispensing operation according to OPORD, unit SOPs, and FM/TMs.	—	—
11. Supervised shut down and de-fueling of AAFARS.	—	—
12. Ensured components are properly stored.	—	—
13. Maintained records for accountability of product according to OPORD and unit SOP. Provided to supervisor upon completion of HTARS operations.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
 DA FORM 3643  
 DA FORM 5988-E  
 DD FORM 1898  
 FM 10-67-1  
 TM 10-4330-237-13&P  
 TM 10-4930-250-13&P  
 TM 10-4930-351-14  
 TM 10-8110-201-14&P

**Related**

DA PAM 710-2-2  
 DA PAM 750-8  
 FM 3-100.12  
 FM 3-100.4

**Supervise Remote Refueling, Rearming, Deployable Distribution System (R3D2S)****101-92F-2502**

**Conditions:** Given the requirement to provide aviation refueling support on a fixed airstrip or pre-designated field location. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers and one MOS 93H or pathfinder personnel that have required Air Traffic Control (ATC) skills; customer (aircraft with crew), aircraft (UH-60) and customer aircraft, communication equipment, R3D2S, Forward Area Refueling Equipment (FARE), HTARS equipment, fire extinguishers, spill kit/containers, personal protective equipment (PPE), risk management procedures, Material Safety Data Sheets (MSDS) or Hazardous Material Information Sheet (HMIS), Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP) (if required), written or oral operations order (OPORD), unit standing operating procedures (SOP), DA Form 3643 (Daily Issues of Petroleum Products), DA Form 2765-1 (Request for issue or Turn-in), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)), and full access to all reference material.

**Standards:** Supervise the assembly, operation, operator's preventive maintenance checks and services (PMCS), fuel accountability, quality surveillance, and disassembly of the R3D2S. Ensure aircraft are refueled with aviation and on grade fuel without injury to personnel or damage to equipment.

**Performance Steps**

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
3. Ensure personnel read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Enforce wearing of appropriate PPE as required.
5. Supervise inventory of R3D2S. Ensure components are complete and serviceable prior to mission.
6. Supervise assembly of R3D2S components to ensure system is set up according to OPORD and appropriate technical manuals (TMs).
  - a. Ensure grounding and bonding of pump, accessory, filter/separator, and each refueling point.
  - b. Post NO SMOKING, DANGER, PASSENGER MARSHALING AREA, and EMERGENCY SHUTOFF signs.
  - c. Ensure drip pans are placed at each refueling point and fuel source.
  - d. Ensure fire extinguishers are at each refueling point (but not so close that they cannot be reached in an event of a fire).
  - e. Ensure there is a 5-gallon can of water at each refueling point for any emergency.
  - f. Clear ground of all sticks, stones, and debris to prevent them from being sucked up or transformed into dangerous projectiles by the rotor wash.
  - g. Ensure immediate refueling area, paths of approach, and hover lanes are cleared before operations.
  - h. Mark refueling points with lighted beanbags or chemical lights for night time operations.
7. Supervise before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate TMs. Ensure personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.

**Performance Steps**

- 8. Conduct Aqua-Glo and millipore tests and record results and provide to supervisor.
- 9. Supervise dispensing operation according to OPORD, unit SOPs, and field manuals (FMs)/TMs.
  - a. Ensure appropriate PPE is worn.
  - b. Ensure soldier manning the nozzle guides aircraft into position using proper hand and arm signals according to FM 10-67-1.

**CAUTION**  
 Ensure pilot has armaments on safe prior to soldier guiding aircraft in for refueling.

- c. Brief passengers on proper dismounting/mounting procedures and acquaint them with the marshalling area.
  - d. Ensure passengers go to marshaling area during refueling operation.
- NOTE: Crew members, except pilot or copilot who may remain at controls if necessary, should deplane and assist with refueling or man fire extinguisher.
- e. Ensure pilot notifies his/her commander that he/she will be off the air during refueling.
  - f. Ensure all radios are turned off except radio used to monitor air traffic.
  - g. Ensure bonding of aircraft.
  - h. Ensure personnel account for issue of product in accordance with OPORD and unit SOP.
- 10. Supervise shut down and disassembly of R3D2S.
  - 11. Ensure components are properly stored.
  - 12. Maintain records for accountability of product according to OPORD and unit SOP. Provide to supervisor upon completion of R3D2S operations.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Supervised inventory of R3D2S.	—	—
6. Supervised assembly of R3D2S components and ensured system was set up according to OPORD and appropriate TMs.	—	—
7. Supervised before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate TMs. Ensured personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	—	—
8. Conducted Aqua-Glo and millipore tests and recorded results and provided to supervisor.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
9. Supervised dispensing operation according to OPORD, unit SOPs, and field manuals (FMs)/TMs.	—	—
10. Supervised shut down and disassembly of R3D2S.	—	—
11. Ensured components are properly stored.	—	—
12. Maintained records for accountability of product according to OPORD and unit SOP. Provided to supervisor upon completion of R3D2S operations.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
 DA FORM 3643  
 DA FORM 5988-E  
 FM 10-67-1  
 FM 3-04.111  
 TM 10-4930-229-12&P  
 TM 5-4930-237-10

**Related**

DA PAM 710-2-2  
 DA PAM 750-8  
 FM 3-100.12  
 FM 3-100.4

## Supervise Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem Operations

### 101-92F-2504

**Conditions:** Given the requirement to supervise fueling operations in a field environment. Personnel and materials required to perform task: six military occupational specialty (MOS)-qualified (92F) Soldiers; Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem, one 5-ton forklift with operator, risk assessment procedures, Material Safety Data Sheets (MSDS), personal protective equipment (PPE), communication equipment; fire extinguishers, spill kits/containment and clean up equipment, Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP) (if required), an oral or written operations order (OPORD), unit standing operating procedure (SOP) on petroleum operations, DA Form 2765-1 (Request for Issue or Turn-in), DA Form 3643 (Daily Issues of Petroleum Products), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)), DD Form 1898 (Fuel Sale Slip), and full access to all reference material.

**Standards:** Supervise the set up, operation, preventive maintenance checks and services (PMCS), fuel accountability, quality surveillance, and dismantling of the Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem without injury to personnel, damage to equipment, or of the environment.

### Performance Steps

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Maintain appropriate MSDS.
  - a. Identify potential environmental hazards.
  - b. Extract information from MSDS.
  - c. Determine safety measures from MSDS.
  - d. Implement safety measures extracted from MSDS.
3. Ensure personnel read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Enforce wearing of appropriate PPE as required.
5. Supervise before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate technical manuals (TMs). Ensure personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.
6. Supervise inventory of bulk fuel storage and distribution system. Ensure components are complete and serviceable prior to mission.
7. Supervise site preparation.
  - a. Ensure area is cleaned of any debris that may puncture a collapsible tank.
  - b. Ensure filter separator and pump areas are clear of grass, trash, and leaves.
8. Supervise layout of Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem according to OPORD and unit tactical standing operating procedure (TSOP).
  - a. Ensure components are positioned on reasonably level ground.
  - b. Check that low lying areas are avoided so that vapors do not collect.
  - c. Ensure plunges and caps remain on components until connection is made.

**Performance Steps**

9. Supervise operation of Force Provide (FP) Bulk Fuel Storage and Distribution Subsystem according to unit TSOP and applicable reference materials.
  - a. Monitor site for safety violations and environmental compliance.
    - (1) Enforce grounding and bonding procedures for tanker and each refueling point.
    - (2) Ensure appropriate PPE is worn.
    - (3) Ensure fire extinguishers are at each refueling point and source of fuel.
    - (4) Ensure drip pans are in place at each refueling point and fuel source.
    - (5) Ensure NO SMOKING signs are posted.
    - (6) Ensure there are 5-gallon water containers at each refueling point and each fuel source.
    - (7) Ensure that there is no flame producing material within 100 feet of bulk fuel storage and distribution system.
    - (8) Ensure that engines are off on vehicles when refueling.
  - b. Check product prior to receipt.
  - c. Gauge tankers prior to receiving product.
  - d. Ensure personnel account for issue and received of product by completing DA Form 3643 and DA Form 2765-1 in accordance with OPORD and unit SOP.

NOTE: There are a variety of forms that can be used at the bulk fuel distributing point for accountability of products. That you need to be familiar with as a operator/supervisor they are as follows: DD Form 250, DA Form 2765-1, DD Form 1348-1A, DA Form 3644, and DD Form 1898. Information on filling out forms can be found in DA Pamphlet 710-2-1.

- e. Ensure quality surveillance procedures are performed according to unit SOP.
10. Ensure quality surveillance on petroleum products are being maintained according to unit SOP.
11. Supervise dismantling of Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem.
12. Maintain records for accountability of product according to OPORD and unit SOP. Provide to Class III Section Chief upon completion of fueling operations.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Supervised before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate TMs. Ensured personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	—	—
6. Supervised inventory of bulk fuel storage and distribution system. Ensured components were complete and serviceable prior to mission.	—	—
7. Supervised site preparation.	—	—
8. Supervised layout of Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem according to OPORD and unit tactical standing operating procedure (TSOP).	—	—



<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
9. Supervised operation of Force Provide (FP) Bulk Fuel Storage and Distribution Subsystem according to unit SOP and applicable reference materials.	—	—
10. Ensured quality surveillance on petroleum products are being maintained according to unit SOP.	—	—
11. Supervised dismantling of Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem.	—	—
12. Maintained records for accountability of product according to OPORD and unit SOP. Provided to Class III Section Chief upon completion of fueling operations.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
 DA FORM 3643  
 DA FORM 5988-E  
 DD FORM 1898  
 FM 10-67-1

**Related**

DA PAM 710-2-2  
 FM 3-100.12  
 FM 3-100.4

Subject Area 8: SUPERVISING PIPELINE OPERATIONS

**Determine Interface Cut Operations**

**101-92F-2253**

**Conditions:** Given the requirement to supervise diverting petroleum products in an operational Inland Petroleum Distribution System (IPDS) in a field environment. The personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers; risk management procedures, multi-product operational pipeline system, Tactical Petroleum Terminal (TPT) fuel unit, an operating pump station, daily pumping orders, a manifold system, communication equipment, personal protective equipment (PPE), chemical protective gloves, containment and clean up equipment, hydrometer cylinder, set of thermohydrometers (hydrometers with integral thermometers), level work surface, rags, temperature of petroleum product, corrected American Petroleum Institute (API) gravity of product, applicable Material Safety Data Sheets (MSDS), Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, the unit hazardous waste/hazardous material (HW/HM) management policy, Oil Discharge Contingency Plan (ODCP) (if required), unit standing operating procedure (SOP), and full access to all reference material.

**Standards:** Determine interface cut operations for petroleum being moved by pipeline to ensure products are not commingled and the environment and equipment are not damaged.

**Performance Steps**

1. Apply risk management procedures.
    - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
    - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
  3. Ensure personnel read and understand unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
  4. Enforce wearing of appropriate PPE as required.
  5. Ensure proper test items (hydrometer, sample bottle, and cylinder) are on hand for the appropriate product in pipeline.
  6. Verify both products corrected API gravities and convert to existing line temperature prior to taking samples.
  7. Supervise personnel taking line samples.
    - a. Take first line sample 20 minutes before expected time of interface arrival. Then every 5 minutes after until 5 minutes before expected time of interface arrival.
    - b. Beginning five minutes before expected arrival time, samples are taken each minute.
    - c. Ensure that when interface arrives, line samples are taken two or three times per minute.
- NOTE: When samples are taken at intervals of one minute or less, the sample line may be left open and flowing. This ensures representative samples during the actual change.
- d. Ensure API gravity is determined for each sample as it is taken.
  - e. Notify personnel at switching manifold when interface arrives, have interface routed to contaminated fuel module.

NOTE: Always ensure flow, by opening a new path for flow before closing a path.

**Performance Steps**

f. Notify personnel at switching manifold when interface has passed.

NOTE: When sampling indicates the interface has passed, that is, two or more samples have the same visual and gravity characteristics compatible with the new batch specification, the batch is directed to the appropriate fuel unit and the flow to the contaminated fuel module is then stopped.

g. Ensure valves are opened or closed as required by OPORD.

- 8. Maintain communications with chain of command and render status reports as required by unit policy.
- 9. Ensure that samples are taken to laboratory after each product switch.
- 10. Ensure components are properly stored.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Ensured proper test items (hydrometer, sample bottle, and cylinder) are on hand for the appropriate product in pipeline.	—	—
6. Verified both products corrected API gravities and converted to existing line temperature prior to taking samples.	—	—
7. Supervised personnel taking line samples.	—	—
8. Maintained communications with chain of command and rendered status reports as required by unit policy.	—	—
9. Ensured components are properly stored.	—	—
10. Ensured that samples are taken to laboratory after each product switch.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

FM 10-67-1  
 TM 5-6630-218-10

**Related**

TM 5-3835-220-13&P

## Supervise Pipeline Operations

101-92F-2410

**Conditions:** Given the requirement to supervise pipeline pumps on a 24-hour basis in a field environment. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers; storage tanks; operational pipeline system with 800-gallons per minute (GPM) mainline pump station; 600-GPM transfer and flood pump; communication equipment; all the necessary tools; risk management procedures; applicable Material Safety Data Sheets (MSDS); personal protective equipment (PPE); fire extinguishers; fuel; oil; rags; pencil; Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; unit standing operating procedure (SOP); daily pumping orders; DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)); DA Form 4818 (Petroleum Products - Pump Station Operations Log); DA Form 5464-R (Petroleum Products Pipeline Leakage Report), and full access to all reference materials.

**Standards:** Supervise petroleum pipeline pump station operations according to established pumping orders and without commingling of products or damage to equipment or the environment.

### Performance Steps

#### **DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
3. Ensure personnel read and understand unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Enforce wearing of appropriate PPE as required.
5. Supervise before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to unit SOP and appropriate technical manuals (TMs). Ensure personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.
6. Review daily pumping orders. Identify starting time, quantity, route, and destination of product.  
NOTE: Daily pumping orders will include: Type of fuel, Batch number, Destination of each batch, Amount of fuel in batch, Estimated size of interface, Estimated times of arrival of interface at terminals, Starting and stopping times of all pumping operations, Type of interface to cut, and Pipeline pump station pressures and pipeline flow rates.
7. Ensure pump station is ready for operations.
  - a. Check grounding of pump.
  - b. Check fire extinguisher.

**Performance Steps**

- c. Check communications.
- d. Check to ensure mainline, bypass, and side valves on receiver and launcher are in proper position.
- e. Check that strainer is open and ready for operation.
- f. Ensure all safety and environmental precautions are taken.

8. Supervise pump station operations.

- a. Ensure pumps are operating according to unit SOP and daily pumping order.

NOTE: Mainline pump units operating temperature must be at 120 prior to putting on line. This is done at idle speed of approximately 800 to 1,000 RPM. Allow 20 to 30 minutes for warm up.

- (1) Monitor pressure gauges and meters for correct readings.
- (2) Draw samples for testing.
- (3) Conduct scrapper operations as required.
- (4) Ensure DA Form 4818 is completed.
- (5) Report interface arrival.

- b. Review daily pumping order to determine arrival time of a product interface and ensure interface cut operations are performed in accordance with unit SOP.

- c. Ensure pumps are shut down properly for conditions as stated in pumping order.

NOTE: Pipeline will be shutdown under packed or slack conditions according to daily pumping orders.

- d. Maintain files on pump station operations.

NOTE: The following records, as a minimum, should be maintained: daily pumping orders, DA Form 4818, and DA Form 5464-R.

9. Provide hourly report according to daily pumping order and unit SOP.

- a. Batch number.
- b. Line temperature.
- c. Atmospheric temperature.
- d. Suction pressure.
- e. Discharge pressure.

10. Conduct pipeline patrols.

NOTE: Pipeline patrols should be sent out often and at different times each day so that no one predict when a patrol may be in a specific area.

- 11. Observe operations for any safety or environmental infractions and stop operations immediately if any violations are found and correct them.

- 12. Maintain communications with chain of command and render status reports as required by unit policy.

- 13. Maintain records on mainline pump station operations according to OPORD and unit SOP. Provide to supervisor upon completion of shift.

**Evaluation Preparation:** See task Conditions and Standards.

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
5. Supervised before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to unit SOP and appropriate technical manuals (TMs). Ensured personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	—	—
6. Reviewed daily pumping orders.	—	—
7. Ensured pump station ready for operations.	—	—
8. Supervised pump station operations.	—	—
9. Provided hourly report according to daily pumping order and unit SOP.	—	—
10. Conducted pipeline patrols.	—	—
11. Observed operations for any safety or environmental infractions and stop operations immediately if any violations are found and correct them.	—	—
12. Maintained communications with chain of command and render status reports as required by unit policy.	—	—
13. Maintained records on mainline pump station operations according to OPORD and unit SOP. Provided to supervisor upon completion of shift.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 2404
- DA FORM 4818
- DA FORM 5464-R
- DA FORM 5988-E
- FM 10-67-1
- TM 10-4320-307-10
- TM 5-4320-305-10

**Related**

- DA PAM 750-8
- FM 3-100.12
- FM 3-100.4

## Supervise Installation of Petroleum Valves and Pipeline Sections

**101-92F-2411**

**Conditions:** Given the requirement to supervise the maintenance and installation of an operational Inland Petroleum Distribution System (IPDS) in a field environment. Personnel and materials required to perform task: two military occupational specialty (MOS)-qualified (92F) Soldiers to assist, operational pipeline system, IPDS pipeline sections, pre-selected pipeline/hose trace (route), risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE), communication equipment; fire extinguishers, spill kit/containers, repair clamps (over coupling clamp or half saddle clamp), tools (hoseline installation and repair assembly, cutting and grooving machine, pipeline tapping equipment), Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; the unit hazardous waste/hazardous material (HW/HM) management policy; unit standing operating procedure (SOP); daily pumping order; DA Form 5464-R (Petroleum Products Pipeline Leakage Report), and full access to all reference materials.

**Standards:** Supervise the maintenance, installation, and monitoring of petroleum pipeline sections ensuring fuel leaks are detected and repairs are made without injury to personnel, damage to equipment, or pollution of the environment.

### Performance Steps

#### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

#### WARNING

**A constant fire and hazards explosion exists on a pipeline because of the fuels. Repair teams should use an explosimeter to determine how explosive and toxic an area is before entering. When disconnecting a pipeline to replace damaged pipe or fittings or when a line break occurs, immediately shut down the line and close the closest block valves on each side of the break to capture as much of the fuel as possible before it becomes a fire hazard. Every opening could be a potential fire. Fire fighting troops should accompany repair crews on major repair assignments.**

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
3. Ensure personnel read and understand unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.

### Performance Steps

4. Enforce wearing of appropriate PPE as required.
5. Ensure proper maintenance is performed on IPDS components according to unit SOP.
  - a. Supervise maintenance on valves according to field manuals/technical manuals (FMs/TMs).
  - b. Supervise scraper operations.
    - (1) Conduct scraper operations according to daily pumping order and unit SOP.
    - (2) Notify district dispatch office when scraper is launched or received.
    - (3) Monitor pressure gauges and meters for correct readings.
    - (4) Monitor time it takes scraper to travel to next pumping station/receiving point.
    - (5) Notify district dispatch office if scraper does not reach receiving point on time.
  - c. Supervise pipeline patrols.
    - (1) Inventory equipment for patrol (such as DA Form 5464-R, spill kit/containers, shovels, absorbent material, fitting, and tools for temporary repairs).
    - (2) Maintain communications with district dispatch office at all times.
    - (3) Notify district dispatch office of any leaks, pilferage, or signs of sabotage within pipeline trace.
    - (4) Complete DA Form 5464-R as required.
  - d. Supervise temporary repairs to pipeline.
    - (1) Notify district dispatch office of repair and type of fitting that was used.
    - (2) Provide supervisor with completed DA Form 5464-R on repair services performed.
6. Supervise installation of IPDS aluminum pipeline sections making on-the-spot corrections as necessary according to unit SOP.

### WARNING

**A constant fire and hazards explosion exists on a pipeline because of the fuels. Repair teams should use an explosimeter to determine how explosive and toxic an area is before entering. When disconnecting a pipeline to replace damaged pipe or fittings or when a line break occurs, immediately shut down the line and close the closest block valves on each side of the break to capture as much of the fuel as possible before it becomes a fire hazard. Every opening could be a potential fire. Fire fighting troops should accompany repair crews on major repair assignments.**

NOTE: All major repairs will be under the direct supervision of the pipeline dispatch officer in charge (OIC). No work requiring connecting/replacing components will be done without the authorization of the pipeline dispatch OIC.

- a. Enforce safety measures prior to breaking pipeline.
  - (1) Keep all vehicles a safe distance from a leak.
  - (2) Approach leak from windward side.
  - (3) Do not approach a leak from a lower level, fuel vapors flow downhill.
  - (4) Know how to administer first aid for burns and how to give artificial respiration. Make sure you have adequate first-aid material, including burn ointment and blankets.
  - (5) Wear leakproof rubber or synthetic rubber boots when standing in fuel.
  - (6) Use every precaution to prevent striking sparks when removing and replacing pipe fittings.
  - (7) Use sparkless brass hammers when replacing snap-joint couplings.
  - (8) Enforce and observe NO SMOKING rules.
  - (9) Never try to weld pipe holes; use clamps.
  - (10) Cover an area with petroleum fire-preventing foam even after repairing a leak or break and salvaging the fuel. The area may remain potentially dangerous for several days. Guards should be posted and they should monitor the area for explosiveness, as required.



**Performance Steps**

## b. Permanent repairs.

## (1) Coupling replacement.

- (a) Make sure fire fighting equipment is handy.
- (b) Stop pumping operations.
- (c) Close gate valves on each side of the faulty coupling.
- (d) When required, draw fuel from pipeline by using drain assembly or by tapping into pipeline using the tapping machine. One mile of 6-inch pipe holds approximately 195 barrels or 8,185 gallons of fuel.
- (e) After removing fuel in pipeline, attach a come along to each side coupling approximately 5 feet from coupling on each pipe section. Place 4 x 4 blocks (two on each side) between come along chain and pipe. By doing this, you will be able to remove the coupling and at the same time keep the pipeline from separating prior to putting on new coupling.
- (f) If required, remove over-coupling leak clamp by taking out the four large side bolts if a temporary repair was made. Catch spilled fuel in a container.
- (g) Remove split-ring coupling and gasket.
- (h) Check pipe grooves fray ends or foreign substances that may be causing leakage.
- (i) Check coupling drift pins for wear and coupling gaskets for possible cause of leakage.
- (j) If there is no sign of damage to split-ring coupling, then replace gasket by removing old gasket and replacing it with a new gasket. Put a thin coat of grease on each gasket prior to placing gasket on split-ring coupling.
- (k) Ensure pipeline sections are in align and free of any foreign matter. Place split-ring coupling under bottom of pipe sections ensuring coupling is seated in pipe grooves. Close coupling over pipe and drive drift pin in coupling locking split-ring coupling.
- (l) Clean up any HW that may accrue during repairs.
- (m) Notify dispatcher of completion of repairs and open up gate valves slowly to put pressure back in the pipeline.
- (n) Start pumping again.
- (o) Check the new coupling for leaks.

## (2) Pipe replacement.

- (a) Move fire fighting equipment into the area.
- (b) Stop pumping operations.
- (c) Close gate valves on each side of pipe section to be replaced.
- (d) When required, draw fuel from pipeline by using drain assembly or by tapping into pipeline using the tapping machine. One mile of 6-inch pipe holds approximately 195 barrels or 8,185 gallons of fuel.
- (e) After removing fuel in pipeline, break line by removing coupling at both ends of pipe section to be replaced.
- (f) Remove damage pipe section and replace it with new pipe. When putting in new section of pipe, use new gaskets in split-ring coupling.
- (g) Clean up any HW that may accrue during repairs.
- (h) Notify dispatcher of completion of repairs and open gate valves slowly to put pressure back in pipeline.
- (i) Start pumping again.
- (j) Check new section of pipe and couplings for leaks.

7. Supervise test procedures for pressurize pipeline on newly installed sections for leaks according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Ensured proper maintenance is performed on IPDS components according to unit SOP.	—	—
6. Supervised installation of IPDS aluminum pipeline sections making on-the-spot corrections as necessary according to unit SOP.	—	—
7. Supervised test procedures for pressurize pipeline on newly installed sections for leaks according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 5464-R  
 FM 10-67-1  
 FM 5-482  
 TM 10-3835-231-13

**Related**

FM 3-100.12  
 FM 3-100.4

## Supervise Transfer Operations

### 101-92F-2412

**Conditions:** Given the requirement to supervise the tank farm manifold valves to set up transfer operations in a field environment. Personnel and materials required to perform the task: four military occupational specialty (MOS)-qualified (92F) Soldiers; an operating petroleum terminal, a transfer order, personal protective equipment (PPE), risk management procedures, applicable Material Safety Data Sheets (MSDS), communications equipment, Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, communication equipment, portable petroleum sampling and gauging kit, DA Form 2765-1 (Request for Issue or Turn-in), DA Form 3643 (Daily Issues of Petroleum Products), DA Form 4193 (Petroleum Products Pump Station Hourly Operations Record), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)), unit standing operating procedure (SOP), and full access to all reference material.

**Standards:** Complete a transfer operation in a terminal, without injury to personnel, damage to equipment or to the environment.

#### Performance Steps

### DANGER

**REVIEW HAZARDOUS MATERIAL IDENTIFICATION SHEETS (HMIS) OR MSDS ON THE PRODUCT BEING TRANSFERRED. FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
3. Ensure personnel read and understand unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Enforce wearing of appropriate PPE as required.
5. Supervise before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to unit SOP and appropriate technical manuals (TMs). Ensure personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.
6. Ensure general safety procedures are followed.
  - a. Position fire extinguishers within 5 to 10 feet.
  - b. Post NO SMOKING signs within 50 feet.
  - c. Ground and bond all equipment.
  - d. Use spill containers.
  - e. Protect yourself and others from fumes and vapors.
7. Receive pumping order from operations office.

### Performance Steps

8. Review pumping order to determine tanks to be used and valves to be opened.
9. Set up manifold system according to pumping order.
10. Ensure fire fighting equipment is present and serviceable.
11. Supervise transfer operations according to daily pumping order and unit SOP.
  - a. Sample and gauge product in each before and after receipt. All of a dissimilar product must be flushed from common lines and manifold with same product being received or issued before an opening gauge is taken.
  - b. Stop operations and start them slowly and carefully. Observe pressure gauges to prevent exceeding working pressures.
  - c. Check tank vents for proper operation before product is pumped into or out of a tank. The valve is operational if you can detect fume emission for smell or hear vent clapping.
  - d. During continuous pumping operations, ensure receiving tank remains open until another tank is opened. All hatches must be closed unless gauging and sampling. If pipeline is not in use, tank valves will normally be closed except where they need to be left open to relieve line pressure caused by thermo expansion.
  - e. Maintain communications between personnel operating system at all times.
  - f. Never use water bottoms unless they are authorized by local commander.
  - g. Ensure no more than one tank is open to a line system unless absolutely necessary for an operation.
  - h. Ensure all tanks are kept as full as practicable to reduce evaporation.
  - i. Ensure proper tools, to include keys for locked valves, hatchets, and access pits are available at work site.
  - j. Observe all basic petroleum safety procedures when conducting operations. Observe entire system for leaks or any other unusual operating problems. Stop transfer operations immediately when a problem is observed. If a tank begins to leak, its contents must be transferred to another tank at once and leak must be reported.
  - k. Never force open or close a gate valve. When a gate valve is opened or closed, wheel should be turned back a quarter of a turn.
  - l. Always double check valves to make sure correct ones are opened or closed. The flow into or out of a tank must be verified as soon as possible after start of an operation. Read automatic tank gauges 15 minutes after start of an operation and periodically after that.
  - m. Do not gauge JP-8 tanks manually while they are being filled or emptied. Use extreme caution when gauging other fuel types.
  - n. Inspect empty tanks before they receive assigned product. If tank is dirty, report it to your supervisor. Drain any water present. If water bottoms are present, keep water level below tank inlet. Water test new tanks before they are used.
  - o. Receive into only one tank at a time.
  - p. Take a rough gauge on all tanks, except those receiving JP-8, every hour to prevent overflows. Report cumulative receipts. DO NOT take ullages, water soundings, temperatures, and samples on any tank receiving JP-8 until at least 30 minutes after pumping has stopped and flow has ceased.

NOTE: According to MIL-STD-3004A, it states 30 minutes waiting period prior to gauging any tanks that have received aviation products.

- q. When surface of product gets near full level, open up another tank valve on signal from personnel gauging and then close off full tank. Allow 5 percent of tank capacity for vapor space.
- r. When pumping gasoline or JP-8 into a tank, limit flow rate to one fourth to one fifth of maximum flow rate until the inlet is covered by at least 3 feet of product.
- s. After product has had time to settle, drain any water from tanks. Take a composite sample for submission to a laboratory. Dispose of water according to local SOPs and environmental regulations.

**Performance Steps**

NOTE: According to MIL-STD-3004A, it states minimum settling period of six hours is required for all aviation fuels, automotive gasolines, and diesel fuels. Drain any water from the tanks.

- t. Ensure operators maintain DA Form 4193 on pumping operations.
- u. Maintain DA Form 3643 as required.
- v. Report completion of transfer to operations office.

- 12. Supervise after-operations PMCA for an intraterminal transfer according to daily pumping order and unit SOP.
  - a. Ensure all valves are opened or closed according to pumping orders.
  - b. Ensure product has had time to settle.

NOTE: According to MIL-STD-3004A, it states minimum settling period of six hours is required for all aviation fuels, automotive gasolines, and diesel fuels. Drain any water from the tanks. Take a composite sample for submission to a laboratory. Dispose of water according to local SOPs and environmental regulations.

- c. Ensure after-operations PMCS is performed. Review DA Form 2404 or DA Form 5988-E.
- d. Report completion of transfer to operations office.

- 13. Maintain records of transfer operations according to OPORD and unit SOP. Provide to supervisor upon completion of shift.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/operations order (OPORD) requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Supervised before-, during-, and after-operations preventive maintenance checks and services (PMCS) on system's components according to unit SOP and appropriate technical manuals (TMs). Ensured personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	—	—
6. Ensured general safety procedures are followed.	—	—
7. Received pumping order from operations office.	—	—
8. Reviewed pumping order to determine tanks to be used and valves to be opened.	—	—
9. Set up manifold system according to pumping order.	—	—
10. Ensured fire fighting equipment is present and serviceable.	—	—
11. Supervised transfer operations according to daily pumping order and unit SOP.	—	—
12. Supervised after-operations PMCS for an intraterminal transfer according to daily pumping order and unit SOP.	—	—
13. Maintained records of transfer operations according to OPORD and unit SOP. Provided to supervisor upon completion of shift.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
DA FORM 2765-1  
DA FORM 3643  
DA FORM 4193  
DA FORM 5988-E  
DA PAM 710-2-1  
FM 10-67-1  
MIL-STD-3004A

**Related**

FM 3-100.12  
FM 3-100.4  
FM 5-482  
TM 5-3835-220-13&P  
TM 5-4320-305-10

## Supervise Tactical Petroleum Terminal (TPT) Operations

### 101-92F-2505

**Conditions:** Given the requirement to supervise the assembly and operation of a Tactical Petroleum Terminal (TPT) System in a field environment. Personnel and materials required to perform task: forty-three military occupational specialty (MOS)-qualified (92F) Soldiers; transport equipment and the primary components of the TPT, which consists of three fuel units, Tank Farm Assemblies, with two 5,000-barrel (bbl) fabric tanks each, a Tanker Truck Receipt Manifold, a Fuel Dispensing Assembly, a Transfer Hoseline Assembly, six Fire Suppression Assemblies, an Optional Tank Configuration, and a Fuel Unit Support Assembly, petroleum products, communications equipment, risk management procedures, Material Safety Data Sheets (MSDS), personal protective equipment (PPE), communication equipment; fire extinguishers, spill kits/containment and clean up equipment, Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP) (if required), oral or written operations order (OPORD), unit standing operating procedure (SOP) on TPT operations, daily pumping order, DA Form 1804 (Petroleum Sample), DA Form 3643 (Daily Issues of Petroleum Products), DA Form 2765-1 (Request for Issue or Turn-in), DA Form 4193 (Petroleum Products Pump Station Hourly Operations Record), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)), and full access to all reference material.

**Standards:** Supervise the assembly, operation, preventive maintenance checks and services (PMCS), fuel accountability, quality surveillance, and disassembly of the TPT without damage to equipment, injury to personnel, or pollution of the environment.

### Performance Steps

1. Apply risk management procedures.
  - a. Understand and supervise the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
2. Ensure environmental stewardship measures are followed according to critical task 101-92F-2401.
3. Ensure personnel read and understand unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.
4. Enforce wearing of appropriate PPE as required.
5. Supervise before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate technical manuals (TMs). Ensure personnel record faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.
6. Enter communication nets and monitor communications flow in accordance with unit SOP and communication operating instructions.
7. Ensure internal cleanliness of all equipment, valves, fittings, and hoses when installing.
  - a. Sand, rocks, rags, tools, clothing, and so forth left inside, will end up blocking flow or damaging equipment.
  - b. Positive actions must be taken to avoid the entry of dirt and contaminants.
  - c. Leave protective caps and plugs in place until actually ready to be taken to make connection.
  - d. Inspect the parts being assembled and remove any foreign materials prior to closing the joint.

**Performance Steps**

NOTE: Coupling clamps are normally shipped loose with the gaskets packaged separately or on assemblies. They are clamped in place without the gasket installed. Gaskets must be slipped over the pipe or fitting ends and the coupling clamp placed over them.

NOTE: Stem packing on valves is normally shipped with the gland nuts not taken up tightly. It is necessary that the gland be tightened before the valve is put under pressure in test or operation.

8. Supervise placement of major end items in accordance with layout plan.

**WARNING**

**Ground and bond equipment at time of installation to prevent explosion or fire.**

- a. Install floodlight set.

NOTE: Installation of floodlights early in the erection program is necessary to permit work at night.

**WARNING**

**Do not attempt to set up floodlight set on loose or unstable soil or on grades of more than five degrees. If the floodlight set topples over, severe damage to equipment and injury or loss of life may occur.**

- (1) Select location for floodlight set and ensure ground is level and does not have a grade of more five degrees.
- (2) Ensure installation and preparation of floodlight set is performed according to equipment TM 9-6230-211-14.
- (3) Ensure operation procedures are performed according to unit SOP and TM 9-6230-211-14.
- b. Install 5,000-barrel and 50,000-gallon fabric collapsible tanks.
  - (1) Perform PMCS, install on assigned pad, and assemble appurtenances in accordance with TM 10-3835-231-13 and TM 10-5430-219-12.
    - (a) Check for holes, tears, or abnormalities in form or shape of the tanks.
    - (b) Check shelf life of the tanks. Manufactured date, inspections date, and release date from the depot or APS.
  - (2) Be sure to cut a small trench for the drain hose prior to unrolling that end of the tank under which the hose will pass.
  - (3) Ensure one drain on tank is located over low spot in pad and that tank orientation is such that top fitting intended for pump suction is one closest to this same drain.
  - (4) Ensure that tank pad is free of sharp objects and smooth prior to rolling out tank.
  - (5) Ensure all warnings and cautions noted in TM 10-5430-219-12 are observed and abided.
  - (6) Inspect all connections to verify correct installation of flanges, coupling gaskets, clamps, and security of camlock devices.



**Performance Steps**

- c. Install 600-GPM pump according to site plans and TM 5-4320-305-10.

**WARNING**

**GROUNDING AND BONDING - Pumps must be grounded at time of installation to prevent explosion or fire.**

**CAUTION**

Install pump as far away from the tanks it serves without bridging the suction hose or deforming the tank top. Pump engine and exhaust fumes are hot and distance from tanks enhances safety.

- d. Install fire suppression according to site plans, TM 10-4210-235-13, and critical task 101-92F-2315.

9. Supervise set up of Fuel Dispensing Assembly.

**CAUTION**

Make sure all hoselines, fittings, and valves are clean internally prior to connecting. Foreign materials may disrupt operations and damage equipment.

- a. Ensure PMCS and equipment inventory is conducted.
- b. Ensure assembly procedures are followed according to TM 5-3835-220-13&P.
- c. Ensure proper positioning and installations of filter separators, pumps, meter strainer, adapters, couplings, hoses, and dispensing nozzles.
- d. Inspect all connections to verify correct installation of flanges, coupling gaskets and clamps, and security of cam lock devices.

10. Supervise installation of Tanker Truck Receipt Manifold, Hose line, Valves, and Fittings.

NOTE: The tee assembly used in the tanker truck receipt manifold is crated in a partially assembled condition to facilitate packaging and shipping. Some assembly is required to place the unit in operating condition prior to installation.

NOTE: The tanker truck receipt manifolds should be installed only under the direction of operations management.

- a. Ensure tee assemblies are positioned and assembled near their respective installation sites.

**CAUTION**

Make sure all hoselines, fittings, and valves are clean internally. Foreign materials may disrupt operations and damage equipment.

- b. Ensure tanker truck receipt manifold components are properly positioned and installed in their respective installation position as shown on layout plan.

## Performance Steps

### 11. Supervise installation of Switching Manifold.

#### CAUTION

Make sure all hoselines, fittings, and valves are clean internally. Foreign materials may disrupt operations and damage equipment.

- a. Ensure installation of switching manifold is laid out according to site plan.
- b. Ensure switching manifold components are positioned at their respective installation sites.
- c. Conduct inspections of all items for damage, cleanliness, and quantities required for the set.
- d. Conduct inspections of all connections to verify correct installations of flanges, coupling gaskets, clamps, and security of cam lock devices.

### 12. Supervise installation of Contaminated Fuel Module Hose lines Assembly, Valves, and Fittings.

- a. Install 50,000-gallon collapsible fabric tanks. Be sure that elbows, hoses, and valves supplied with tanks are installed.

#### WARNING

**GROUNDING AND BONDING - Pumps must be grounded at time of installation to prevent explosion or fire.**

#### CAUTION

Install pump as far away from the tanks it serves without bridging the suction hose or deforming the tank top. Pump engine and exhaust fumes are hot and distance from tanks enhances safety.

- b. Ensure both valves are opened to allow free flow of contaminated fuel into the module.
- c. Ensure 350-GPM pump is prepared for use according to TM 10-4320-324-14. Ensure personnel observe all warnings and cautions when preparing pump unit.
- d. Inspect all connections to verify correct installation.
  - (1) Check that quick disconnect gaskets are in place and connected to cam lock adapter.

NOTE: Liberally apply petrolatum to the gasket and the inside surface of coupling clamp to prevent pinching during installation. Then, pull the coupling gasket over one grooved end of each mating joint. Ensure gasket is properly positioned over full circumference of sealing surfaces. Position coupling clamp over gasket while maintaining alignment of mating parts, lock coupling, lamp securely.

- (2) Ensure drip pans, absorbent oil material, and storage drums are placed where they will be available for use if needed.
- (3) Check all connections to verify correct installation of flanges, coupling gaskets, clamps, and security of cam lock devices.

### 13. Supervise installation of Transfer Hose line Assembly, Valves, and Fittings.

- a. Inspect all connections to verify correct installation.
  - (1) Supervise tightening of coupling clamps to gate valves, being careful not to damage gasket.
  - (2) Verify connection of gate valves to tees.
- b. Verify connection of transfer hose line (quantity as required) between tees and receipt manifold assemblies.

## Performance Steps

14. Supervise installation of Optional Tank Configuration, Hose line, Valves, and Fittings.
  - a. Check connection of elbow to 50,000-gallon tanks.
  - b. Check connection of 6-inch suction hose assemblies to elbow.
  - c. Check connection of 6-inch suction assemblies between 6-inch suction hose assemblies and wye assemblies. Ensure correct hose lengths are installed. Make sure correct bend radius are maintained.
  - d. Check connection of 6-inch suction hose between 6-inch tee assemblies and wye assembly.
  - e. Check connection of reducer and coupling adapter to tee assembly.
  - f. Check connection of tee to reducer.
  - g. Check connection of elbows to tank.
  - h. Check connection of 6-inch discharge hose assemblies and to 6-inch gate valve assemblies.
  - i. Check installation of wye assemblies to 6-inch gate valves.
  - j. Check installation of 6-inch discharge hose between wye assemblies and 6-inch tee assemblies.
  - k. Check connection of reducer to 6-inch tee assembly. Ensure connection is complete between adapter and reducer.
  - l. Check connection from tee to adapter.
  - m. Inspect all connections for correct installation.

15. Supervise placement of safety signs.

- a. Set up NO SMOKING signs around fuel dispensing and fuel receipt area.

NOTE: Place NO SMOKING signs within 50 feet of any system or equipment containing flammable fuels. To minimize the threat of smokers, create a well-marked "Smoking Permitted" area well away from the facilities and make that the only area in which smoking is permitted.

- b. Set up "Disconnect Hose before Moving Vehicle" signs at fuel dispensing and receiving areas.
  - c. Place the following safety signs at appropriate locations.
    - (1) Danger - Hot Surface" - at pump engines.
    - (2) Danger - Moving Parts" - at pump and engines.
    - (3) Danger - Wear Goggles and Gloves" - at sampling position.
    - (4) Watch Your Step" - in congested areas.

16. Prepare TPT for operation.

- a. Conduct checks according to unit SOP. Any time unit has been shut down for any extended period, a very thorough inspection should take place. It is recommended that this inspection be guided by a check list that includes but is not limited to the following:
    - (1) All flanges and couplings closed and secure.
    - (2) All valves in closed position.
    - (3) Hoses lay properly with no kinks.
    - (4) Free ends of hoses weighted down with sand bags.
    - (5) All equipment grounded and bonded.
    - (6) Pumps have been checked and ready for operation.
    - (7) Hoses lay properly on tank tops.
    - (8) Tank berms intact. Drains shut.
    - (9) Floodlights in place and operable.
    - (10) Water supply secure.
    - (11) Meters reset.
    - (12) Range poles properly in place.
    - (13) Fire suppression equipment in place and ready for use.
    - (14) First aid equipment intact.
    - (15) NO SMOKING and other safety signs in place.
    - (16) Record keeping facility intact.
    - (17) Area free of trash and hazards.
    - (18) Roadways open.
    - (19) Operating personnel know their individual function.
    - (20) Communications system functional.

**Performance Steps**

- b. Supervise commissioning of TPT system.

NOTE: The term commissioning is meant to include purging air and initial line filling. Commissioning is not intended to include a complete fill of the storage tanks.

- (1) Supervise purging system.

VENT GASES DURING PURGE - The vent gases during purging operations may be a flammable mixture of fuel vapors and air. Special precautions to eliminate ignition sources in the area must be taken.

NOTE: The process of removing air from the system will cause a relatively high venting rate from the tank vents. The vent gas is likely to be flammable due to mixing with fuel vapors and droplets. Special precautions must be taken due to this condition.

**CAUTION**

**INTERNAL DIRT AND WASTE** - Internal dirt, rocks, construction waste, and so forth can ruin operating equipment and cause operating failures. Eliminate such contaminants before commencing operations.

NOTE: Restrict flow rates to under 200-GPM maximum during purging and line fill operations. High and turbulent rates will mix air with the fuel and extend the purging procedure. Low rates will also discourage the generation of static electrical charges.

- (2) Purge and fill fuel unit.

NOTE: Each fuel unit is purged and filled using the same procedures.

- (3) Supervise purging and filling of supply hose lines to contaminated fuel module.
- (4) Verify purging and filling of supply lines.

NOTE: Very low flow rates (approximately 50-GPM maximum) must be maintained during the purge and fill operation until air has been fully purged from the meter skid assembly and the upstream hose line.

High airflow through the meter skid assembly may over speed and ruin the meter.

- (5) Verify purging and filling of discharge lines from tanks.
- (6) Verify purging and filling of discharge lines of tanks and lines to and through fuel dispensing system and back to tank farm (module) assemblies.

**WARNING**

**FUEL SPLASH AND SPILL** - Splashes and spills can cause eye injury and skin irritation. Wear face shield and approved gloves.

**WARNING**

**HOSE WHIP** - Hose may tend to move rapidly or whip if not weighed down. Pressure changes can cause hose whip and injure personnel.

- (7) Supervise purging of discharge lines of fuel tanks.
- (8) Verify completion of commissioning.

**Performance Steps**

17. Supervise operation of TPT.
  - a. Supervise transfer fuel.

**WARNING**

**OVERFILLING FABRIC TANKS - Do not overfill the fabric collapsible tanks. A spill through the vent or possibly a rupture and major spill could result.**

- (1) Check that commissioning procedures have been completed.

**CAUTION**

To avoid damage to equipment:

- Feed rates to the fuel unit should not exceed 800 GPM.
- Pressure at switching manifold (entry pressure) should not exceed 150 psi.
- Pump discharge pressure should not exceed 75 psi.

NOTE: This procedure assumes that fuel is flowing from associated pipeline to one of the fuel units.

- (2) Ensure samples are taken and off specification fuel is directed to contaminated fuel module.
- (3) Ensure receiving of fuel from pipeline is conducted according to daily pumping order and unit SOP.
- (4) Ensure receiving of fuel from tanker trucks is conducted according to unit SOP.

**WARNING**

**TANKER-TRUCK MOVEMENT - Do not allow truck to move away without disconnecting the hose line. A spill could result.**

**Performance Steps**

- (5) Ensure discharging of fuel from a Tank Farm (Module) Assembly through Fuel Dispensing Assembly is conducted according to unit SOP.

**WARNING**

**DISPENSING ASSEMBLY OPERATING PRESSURE** - Make sure that pressure control valves are functioning. High pressure can result in hose whip, splash back, and spills.

**WARNING**

**GROUNDING AND BONDING** - The system dispensing valve must be grounded and bonded to the receipt vessel prior to opening the vessel and dispensing fuel. Static electricity could cause a fire or explosion.

**WARNING**

**NO SMOKING** - Enforce no smoking rules on all personnel, including drivers from outside the TPT.

**WARNING**

**VEHICLE DISCONNECT** - Make sure vehicles are disconnected from the dispensing assembly before moving.

**WARNING**

**STOP VEHICLE ENGINES** - Stop all vehicle engines while loading fuel.

NOTE: The rate of discharge through the dispensing assembly is governed by a 6-inch pressure control valve which is set at 30 psi and is located in the recirculating line of the dispensing set. It is intended that the control valve keep the dispensing pressures at a maximum of 30 psi. There must be good communications between the dispensing operating supervisor and the pump operator

- (6) Ensure transfer fuel from a Tank Farm (Module) Assembly to Associated Pipeline System is conducted according to daily pumping orders and unit SOP.

NOTE: The routing and procedures to transfer from any other tank would be the same except for the valve positions between the tank and the pump.

**Performance Steps****CAUTION**

BACK FLOW - Make sure there is no flow from pipeline system into the TPT to prevent overpressure.

**CAUTION**

Trapping high pressure between closed valves can damage equipment.

(7) Supervise Depressurizing and Draining System.

**WARNING**

**PRESSURIZED SYSTEM - Do not break (open) any flanges or open any couplings until the system is depressurized at that location. Injury can result.**

NOTE: After the TPT is commissioned and placed in operation, it will be necessary from time to time to depressurize and drain various parts of the system for maintenance or disassembly. Throughout the operating and maintenance instructions of the manual, the reader is warned to depressurize the system before breaking (opening) flanges, couplings, and other closures. This is to avoid spills or sprays of fuel that can injure personnel or cause a fire hazard. The following describes procedures recommended for depressurization and draining.

b. Ensure EMERGENCY PROCEDURES are known and trained regularly.

NOTE: As a minimum, make personnel aware of what actions they should take for the following situations: Fire; Hose line break or serious leak; Fabric tank rupture or serious leak; Break or serious leak on a pump; Serious spill due to operating error; Overflowing tank.

18. Supervise preparation for storage.

**WARNING**

**PRESSURIZED SYSTEM - Do not break (open) any flanges or open any couplings until the system is de-pressurized at that location. Injury and fuel spills can result.**

a. Ensure Depressurizing and Draining of System is conducted according to unit SOP.

NOTE: The entire TPT Hose Line System should be pumped and drained to the fabric collapsible tanks to the extent possible. The fuel in the tanks can then be pumped to tanker trucks for disposal as called for by the operating authority.

**Performance Steps**

- b. Ensure disassembly and cleaning of system is conducted according to unit SOP. The following guidelines are for disassembly and cleaning of system and each type of equipment.

**WARNING**

**To avoid explosion or fire, use only explosion proof electrical equipment and enforce "No Smoking" rules in and around all areas in which tanks and other equipment are being cleaned.**

**CAUTION**

**CLEAN AND DRY** - All equipment must be clean and dry prior to preservation and packing. Water will result in corrosion, mildew, and general deterioration, depending on the materials of construction. Fuel left in the equipment may be a fire hazard during transportation and storage. Dirt and debris can cause corrosion and can damage equipment.

- (1) Verify fabric collapsible tanks are drained, dried, and disassembled.

**WARNING**

**FUEL SPILLS** - Spills can result in saturated soil and cause a potential fire hazard.

**WARNING**

**Death or serious injury may result from exposure to toxic or flammable vapors or insufficient oxygen inside petroleum tanks. Do not enter a tank unless the atmosphere inside has been tested by technically qualified safety or health personnel to determine acceptable entry conditions.**



## Performance Steps

**WARNING**

**If any fuel, fuel vapor, or sludge remains in the tank, or an oxygen deficiency exists, the tank must be treated as a "permit required confined space". No one may enter a permit required confined space without approval from qualified safety or health personnel and without required protective clothing and equipment, rescue and emergency service, safety equipment, training, standby personnel, and written permit. If an explosive atmosphere exists within the tank, the tank presents an immediate hazard to safety and must not be entered under any circumstances. Death or serious injury may result if these precautions are not followed.**

- (2) Disassemble, drain, and dry hose lines.

NOTE: All hose lines must be completely dry inside and clean on the outside before capping and before re-packing. It is recommended that all hose lines be tagged with identification at the disassembly site prior to transporting them to the inspection and packing area.

- (3) Displace and evacuate hose line system.

**WARNING**

**Because of potential for fire and/or explosion, the following safety regulations must be followed: There shall be no smoking allowed within 100 feet of the displacement and evacuation operations. Smoking shall be restricted to those areas designated as safe smoking areas. Fuel spills must be cleaned up promptly. Use an absorbent material and dispose of the used material at a designated location. Fuel saturated soil is a fire hazard. Access to spill areas should be restricted until appropriate action is taken and cleanup is complete.**

- (4) Inspect 4-inch hose lines are to be drained, flushed with water, dried, and capped.  
 (5) Inspect hose lines smaller than 4-inch must be drained, flushed, and dried without benefit of a displacement and evacuation kit.  
 (6) Inspect aluminum fittings.

NOTE: Aluminum fittings (tees, elbows, nipples, adapters, and so forth) are to be swabbed clean and dry. Fittings should be tagged at the time of removal to aid identification during re-packing. Box fittings.

- (7) Inspect Coupling Clamps and Gaskets.  
 (8) Inspect Valves and Valve Assemblies. Drain, clean, and dry valve and valve assemblies.  
 (9) Inspect Pressure Regulating Valve Assemblies, Pressure Control Valve Assemblies.

NOTE: These items are to be fully drained and swabbed clean and dry inside and outside. The control and pilot manifolding must be thoroughly drained. Blowing through the vents will aid in doing this.

- (10) Inspect Meter Skid Assemblies (Meter/Strainer Assemblies). These items must be drained and swabbed dry externally.  
 (11) Inspect Pumps and Engines.

NOTE: Pumps are removed from the system end thoroughly drained. Do not drain the engine crankcase or fuel tank at this time. The equipment may be washed down externally and dried as long as no water is allowed inside the equipment.

- (12) Inspect floodlight sets.

**Performance Steps**

NOTE: The floodlight sets are to be disassembled and cleaned. Wash down equipment and thoroughly dry.

- (13) Inspect Fire Suppression Equipment.
- (14) Inspect miscellaneous equipment. All miscellaneous equipment is to be swabbed clean and dry and tagged. External water wash of some equipment is permissible if there is no chance of getting water inside equipment
- (15) Inspect Fabric Collapsible Tanks.
- (16) Inspect Aluminum Fittings.
- (17) Inspect Coupling Clamps and Gaskets.
- (18) Inspect Valves and Valve Assemblies.
- (19) Inspect Pressure Regulating Valve Assemblies, Pressure Control Valve Assemblies.
- (20) Inspect Meter Skid Assemblies (Meter Strainer Assemblies).
- (21) Inspect Pumps and Engines. Proceed with preservation in accordance with TM 5-4320-305-10 for 600-GPM hose line pump and TM 5-4320-226-14 or TM 10-4320-324-14 for 350-GPM.
- (22) Inspect Floodlight Sets. Proceed with preservation in accordance with TM 9-6320-211-14.
- (23) Inspect Fire Suppression Equipment. Proceed with preservation in accordance with TM 10-4210-235-13.
- (24) Inspect miscellaneous equipment. Thoroughly inspect. Make any minor repairs necessary. Pass damaged equipment through appropriate maintenance authority for disposition. Lubricate and paint in accordance with TM 43-0139 as applicable.

- 19. Maintain records for accountability of petroleum products according to OPORD and unit SOP. Provide to supervisor daily upon completion of shift.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured environmental stewardship measures are followed according to critical task 101-92F-2401.	—	—
3. Ensured personnel read and understood unit or installation SOP/OPORD requirements for requisitioning, storing, handling, and disposing of hazardous materials.	—	—
4. Enforced wearing of appropriate PPE as required.	—	—
5. Supervised before-, during-, and after-operations PMCS on system's components according to unit SOP and appropriate TMs. Ensured personnel recorded faults found while performing PMCS on DA Form 2404 or DA Form 5988-E.	—	—
6. Entered communication nets and monitored communications flow in accordance with unit SOP and communication-electronics operating instructions (CEOI).	—	—
7. Ensured internal cleanliness of all equipment, valves, fittings, and hoses when installing.	—	—
8. Supervised placement of major end items in accordance with layout plan.	—	—
9. Supervised set up of Fuel Dispensing Assembly.	—	—
10. Supervised installation of Tanker Truck Receipt Manifold, Hose line, Valves, and Fittings.	—	—
11. Supervised installation of Switching Manifold.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
12. Supervised installation of contaminated Fuel Module Hose Lines Assembly, Valves, and Fittings.	—	—
13. Supervised installation of Transfer Hose Line Assembly, Valves, and Fittings.	—	—
14. Supervised installation of Optional Tank Configuration, Hose Line, Valves, and Fittings.	—	—
15. Supervised placement of safety signs.	—	—
16. Prepared TPT for operation.	—	—
17. Supervised operation of TPT.	—	—
18. Supervised preparation for storage.	—	—
19. Maintained records for accountability of petroleum products according to OPORD and unit SOP. Provided to supervisor daily upon completion of shift.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 1804
- DA FORM 2404
- DA FORM 3643
- DA FORM 4193
- DA FORM 5988-E
- FM 10-67-1
- TM 10-4210-235-13
- TM 5-4320-305-10
- TM 5-4330-211-12
- TM 9-2330-356-14

**Related**

- DA PAM 710-2-2
- DA PAM 750-8
- FM 3-100.12
- FM 3-100.4

Skill Level 3

Subject Area 9: DIRECTING GENERAL PETROLEUM OPERATIONS

**Direct a Petroleum Pilferage Control Program**

**101-92F-3156**

**Conditions:** Given the requirement to direct a petroleum pilferage control program in a field environment. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers; an operational petroleum facility, risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE), unit standing operating procedure (SOP), communication equipment, and applicable reference materials.

**Standards:** Direct a petroleum pilferage control program according to appropriate regulations and unit SOP to ensure security of government property and fuel accountability.

**Performance Steps**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Determine security requirements of facility.
  - a. Determine size and location of facility.
  - b. Determine if stolen items are concealed on person.
  - c. Determine if stolen items are concealed in automobiles.
  - d. Determine if pilfered items are shipped and received through collusion.
  - e. Determine if fake invoices are used to remove property.
  - f. Determine if tanker trucks with false bottoms are used to pilfer product.
  - g. Determine if trash disposal and salvage disposal activities are used to hide property.
  - h. Determine if items are thrown over fences and retrieved later.
  - i. Determine if pilferage is planned with security personnel.
  - j. Determine if items are removed on vehicles belonging to outside contractors or vendors.
3. Direct checkpoint personnel to maintain a close inspection of all vehicles entering or leaving facility.
  - a. Establish an orderly system to have all vehicles pass through a gate guarded by security personnel.
  - b. Check drivers, helpers, and passengers for concealing unauthorized items.
  - c. Check vehicle for unauthorized contents.
  - d. Establish a security log.
  - e. Enter in security log the date, operator's name, description of load, time entered, and time departed.
  - f. Check that vehicle operator has a valid driver's license.
  - g. Verify seal numbers with shipping documents and examine seals for signs of tampering.
4. Perform seal custodian duties.
  - a. Record serial numbers of seals in a log.
  - b. Safeguard all seals until they are issued to users.
  - c. Record seal numbers on transportation documents after vehicles are loaded.
  - d. Have security personnel verify seal numbers at every stop and at all exits and entrances.

**Performance Steps**

5. Determine security hazards for pipelines and hose lines.
  - a. Check for loose flange bolts on pipelines.
  - b. Check for holes dug under pipelines and hose lines.
  - c. Check for loose couplings or holes cut into hose lines.
  - d. Check for sabotage by looking for open pipe flanges, cut hose lines, fires, or explosions.
  - e. Monitor pump for loose valves and sudden drop of pressure.
6. Implement unit SOP on Petroleum Pilferage Control Program as soon as possible.

**Evaluation Preparation:** See task Conditions and Standards.

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
1. Applied risk management procedures.	—	—
2. Determined security requirements of facility.	—	—
3. Directed checkpoint personnel to maintain a close inspection of all vehicles entering or leaving facility.	—	—
4. Performed seal custodian duties.	—	—
5. Determined security hazards for pipelines and hose lines.	—	—
6. Implemented unit SOP on Petroleum Pilferage Control Program.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**  
 FM 10-67-1  
 FM 3-19.30

**Related**  
 FM 3-100.12  
 FM 3-100.4

## Direct Sling Load Operations

### 101-92F-3303

**Conditions:** Given the requirement to direct transportation of packaged petroleum products (500-gallon collapsible drums) by air. Personnel and materials required to perform task: three military occupational specialty (MOS)-qualified (92F) Soldiers; helicopter, risk management procedures, applicable Material Safety Data Sheets (MSDS), packaged petroleum products, fabricated static electricity discharge probe, clevis assembly, slings, tape, personal protective equipment (PPE), helmet, goggles, earplugs, shock proof gloves or leather gloves, A-22 cargo bag, multiple-leg sling set, spill control and cleanup equipment, grounding rod, DA Form 7382-R (Sling Load Inspection Record), DD Form 1898 (Fuel Sale Slip), communication equipment, and applicable reference materials.

**Standards:** Direct sling load operations, ensuring the cargo is properly rigged for transport without loss of cargo, damage to equipment, injury to personnel or pollution of the environment. This task must be performed according to local environmental regulations and policies.

### Performance Steps

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Conduct briefing and ensure personnel are knowledgeable on Concept of Operations in accordance with operations order (OPORD), unit standing operating procedure (SOP), and specific guideline that pertains to task or mission.
  - a. Ensure personnel understand mission or task on hand.
    - (1) Individual tasks or specific role of every personnel to accomplish the mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous waste/hazardous material (HW/HM) management and environmental hazards.
  - f. Discuss specific guideline that pertains to Sling Load Operation.
    - (1) Grounding and bonding of equipment to aircraft.
    - (2) Orientation of site.
    - (3) Approach of aircraft.
    - (4) Hand and arm signal.

(SAFETY: Do not be in front of an armed aircraft at any time)

  - (5) Marshalling area.
3. Conduct Pre-combat Checks and Pre-combat Inspections.
  - a. Inspect personnel uniforms and equipment for serviceability and in conformity to mission, weather, or environment.
  - b. Check that appropriate personal protective equipment is on hand
  - c. Check operator license, dispatch, and preventive maintenance checks and services (PMCS) records.
  - d. Check inventory of equipment to ensure component parts or systems are complete.
  - e. Inspect communication equipment and personnel knowledge on communication procedures and operating instructions.
4. Maintain communications with lower and higher echelon and render reports as required.

**Performance Steps**

5. Identify training and cross-training for all personnel to include licensing for section's equipment.
6. Project maintenance and repair requirements.
7. Conduct final coordination with the aviation unit for airlift assets.
8. Ensure that all necessary equipment and personnel are available for the operation.
9. Brief personnel conducting the operation on safety and environmental hazards prior to operations.
10. Ensure site is set up in accordance with to FM 10-450-3, paragraph 4-3 and FM 3-04.111.
11. Check that DA Form 7382-R, Sling Load Inspection Record, is properly filled out according to FM 10-450-3, Appendix I and distributed to the proper units.
12. Direct sling load operations according to FM 10-450-3 and make on-the-spot corrections as necessary.
13. Inspect site for hazardous material spills, ensure any spills are cleaned up, and report them according to local policy.
14. Ensure that PMCS are performed in accordance with appropriate technical manuals (TMs).
15. Verify that all equipment is inventoried, cleaned, and stored and that all equipment that is non-mission capable (NMC) is replaced or fixed before equipment is stored.
16. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Conducted briefing and ensured personnel are knowledgeable on Concept of Operations.	—	—
3. Conducted pre-combat checks and pre-combat inspections.	—	—
4. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
5. Identified training and cross-training for all personnel to include licensing for section's equipment.	—	—
6. Projected maintenance and repaired requirements.	—	—
7. Conducted final coordination with the aviation unit for airlift assets.	—	—
8. Ensured that all necessary equipment and personnel are available for the operation.	—	—
9. Briefed personnel conducting the operation on safety and environmental hazards prior to operations.	—	—
10. Ensured that site is set up according to FM 10-450-3, paragraph 4-3 and FM 3-04.111.	—	—
11. Checked that DA Form 7382-R, Sling Load Inspection Record, is properly filled out according to FM 10-450-3, Appendix I and distributed to the proper units.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
12. Directed sling load operations according to FM 10-450-3 and made on-the-spot corrections as necessary.	—	—
13. Inspected site for hazardous material spills, ensured any spills are cleaned up, and reported them according to local policy.	—	—
14. Ensured that PMCS are performed in accordance with appropriate technical manuals (TMs).	—	—
15. Verified that all equipment is inventoried, cleaned, and stored and that all equipment that is non-mission capable (NMC) is replaced or fixed before equipment is stored.	—	—
16. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 7382-R
- DD FORM 1898
- FM 10-450-3
- FM 10-450-4
- FM 10-450-5
- FM 10-67-1
- FM 3-04.111

**Related**

- FM 3-100.12
- FM 3-100.4



## Direct Sampling and Gaging Procedures

101-92F-3307

**Conditions:** Given the requirement to direct sampling and gauging procedures in a field environment. Personnel and materials required to perform task: three military occupational specialty (MOS)-qualified (92F) Soldiers; risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protection equipment (PPE), a clear sample bottle, refueling tank vehicle (or other sample source), drip pan or suitable container for waste fuel, a petroleum product sample for visual examinations; petroleum storage containers with product, weighted beaker, bacon bomb thief, a 1-gallon sample can, fuel handlers gloves, pencil, DA Form 1804 (Petroleum Sample), DA Form 3853-1 (Innage Gage Sheet (Using Innage Tape and Bob)), DA Form 3853-2 (Outage Gage Sheet (Using Innage Tape and Bob)), and DA Form 3853-3 (Outage Gage Sheet (Using Outage Tape and Bob)); sample cans/bottle, millipore sampling kit, clean paper towels and rags; aviation fuel in refueling vehicles/system, hydrometer cylinder, Aqua-Glo test kit, 1-quart clear sample bottles, unit standing operating procedure (SOP), and all reference materials.

**Standards:** Direct sampling and gauging procedures ensuring representative samples and accurate gauge results are obtained to account for the quality and quantity of product in petroleum storage/handling containers.

### Performance Steps

#### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Implement environmental stewardship measures according to critical task 101-92F-3312.
3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with operations order (OPORD), unit SOP, and specific guidelines that pertain to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish the mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous waste/hazardous material (HW/HM) management and environmental hazards.
  - f. Discuss specific guideline that pertains to Sampling and Gauging Procedures.
4. Identify training and cross-training for all personnel performing sampling and gaging.

**Performance Steps**

5. Conduct Pre-combat Checks and Pre-combat Inspections.
  - a. Inspect personnel uniforms and equipment for serviceability and in conformity to mission, weather, or environment.
  - b. Check that appropriate PPE is on hand.
  - c. Check operator license, dispatch, and preventive maintenance checks and services (PMCS) records.
  - d. Check applicable reference materials and forms are on hand.
  - e. Inspect communication equipment and personnel knowledge on communication procedures and operating instructions.
6. Ensure qualified personnel are available to perform operation.
7. Ensure proper sampling and gauging equipment is available for operation.
8. Supervise sampling and gauging operations and make on-the-spot corrections.
9. Ensure all necessary information and samples taken are provided to supporting laboratory.
10. Review all gauging records and quantity calculations for accuracy.
11. Implement unit SOP.
12. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensured personnel are knowledgeable on Concept of Operations.	—	—
4. Identified training and cross-training for all personnel performing sampling and gaging.	—	—
5. Conducted pre-combat checks and pre-combat inspections.	—	—
6. Ensured qualified personnel are available to perform the operation.	—	—
7. Ensured proper sampling and gauging equipment is available for operation.	—	—
8. Supervised sampling and gauging operations and make on-the-spot corrections.	—	—
9. Ensured all necessary information and samples taken are provided to supporting laboratory.	—	—
10. Reviewed all gauging records and quantity calculations for accuracy.	—	—
11. Implemented unit SOP.	—	—
12. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

AR 710-2  
DA FORM 1804  
DA FORM 3853-1  
DA FORM 3853-2  
DA FORM 3853-3  
FM 10-67-1  
FM 10-67-2

**Related**

AR 200-1  
FM 100-14  
FM 3-100.12  
FM 3-100.4  
MIL-HDBK-1022A  
MIL-STD-3004A

## Implement a Petroleum Fire and Safety Program

**101-92F-3310**

**Conditions:** Given the requirement to implement a petroleum fire and safety program in a field environment. Personnel and materials required to perform task: six military occupational specialty (MOS)-qualified (92F) Soldiers; fire extinguishers and a simulated or actual controlled fire; risk management procedures, applicable Material Safety Data Sheets (MSDS); personnel protective equipment (PPE) such as gloves, faceshield/goggles, fire protection suits (coat, trousers, boots, hood, harness, and gloves); a Twin Agent Unit (TAU) with nitrogen containers, aqueous film forming foam (AFFF) solution, and dry chemical; a simulated or actual controlled fire; Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required), Hazardous Material Information Sheets (HMIS), unit standing operating procedure (SOP), local policies and regulations, DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)), and all reference materials.

**Standards:** Implements a petroleum fire and safety program according to unit SOP, local policies, and regulations of higher headquarters (HQ).

### Performance Steps

#### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL. BEFORE PERFORMING THIS TASK, READ AND COMPLY WITH THE APPROPRIATE MSDS.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher HQ.
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Implement environmental stewardship measures according to critical task 101-92F-3312.
3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with operations order (OPORD), unit SOP, and specific guidelines that pertain to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish the mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous materials/wastes management and environmental hazards.
  - f. Discuss specific guideline that pertains to Petroleum Fire and Safety Program (refer to unit SOP).
4. Conduct Pre-combat Checks and Pre-combat Inspections.
  - a. Inspect personnel uniforms and equipment for serviceability and in conformity to mission, weather, or environment.

**Performance Steps**

- b. Check that appropriate personal protective equipment is on hand.
  - c. Check all applicable reference materials and required forms.
  - d. Inspect communication equipment and personnel knowledge on communication procedures and operating instructions.
5. Inspect area for compliance with unit SOP for fire and safety hazards.
    - a. Ensure corrective actions are taken immediately for any deficiencies discovered.
    - b. Inspect fire extinguishers monthly for serviceability. Ensure replacement if unserviceable.
    - c. Check appropriate number of personnel working in a given area.
    - d. Check equipment operating in the area without flame and spark arresters.
    - e. Check for spills or leaks and vapors that may present a problem in area.
    - f. Ensure first aid equipment is located in area.
  6. Schedule training according to unit SOP to ensure training covers fighting a fire with an extinguisher/TAU and performing first aid.
  7. Conduct training on the TAU and cover the following areas:
    - a. Operational procedures of unit.
    - b. Positioning of unit.
    - c. Maintenance procedures.
    - d. Using proper fire fighting techniques to control and suppress a fire.
    - e. First aid.
  8. Ensure firefighting equipment TAU is in operational ready status.
  9. Develop procedures Soldiers are to follow when a alarm has been given for fire.
  10. Conduct fire drills using TAU.
  11. Ensure safe and effective techniques are used to control and extinguish/suppress fire.
  12. Evaluate severity of fire and call for additional help as needed.
  13. Fill out accident report according to local policy and turn in to supervisor.
  14. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensured personnel were knowledgeable on Concept of Operations.	—	—
4. Conducted pre-combat checks and pre-combat inspections.	—	—
5. Inspected an area for compliance with unit SOP for fire and safety hazards.	—	—
6. Scheduled training according to unit SOP to ensure training covers fighting a fire with an extinguisher/TAU and performing first aid.	—	—
7. Conducted training on TAU.	—	—
8. Ensured firefighting equipment TAU is in operational ready status.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
9. Developed procedures Soldiers are to follow when a alarm has been given for fire.	—	—
10. Conducted fire drills using TAU.	—	—
11. Ensured safe and effective techniques are used to control and extinguish/suppress fire.	—	—
12. Evaluated severity of fire and called for additional help as needed.	—	—
13. Filled out accident report according to local policy and turned in to supervisor.	—	—
14. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 2404
- DA FORM 5988-E
- FM 10-67-1
- FM 3-100.12
- FM 3-100.4

**Related**

- TM 10-4210-235-13

## Implement a Petroleum Environmental Stewardship Protection Program

101-92F-3312

**Conditions:** Given the requirement to administer an environmental stewardship program in a field environment. Personnel and materials required to perform task: fourteen military occupational specialty (MOS)-qualified (92F) Soldiers: a petroleum unit, hazardous waste (HW) or other hazardous material (HM) which might generate HW; local, state, federal, and Host Nation (HN) environmental laws; applicable Material Safety Data Sheets (MSDS); Hazardous Material Identification System (HMIS); Facility Response Plan (FRP); Spill Prevention Response Plan (SPRP), Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required), the unit HW/HM material management policy, and all reference materials.

**Standards:** Administer an environmental stewardship program which allows mission accomplishment while minimizing damage to the environment.

### Performance Steps

#### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action review (AARs).
2. Verify applicable MSDS are maintained.
  - a. Obtain MSDS for all petroleum products which might be sample.
  - b. Post MSDS in an accessible location.
  - c. Update MSDS as required.
  - d. Ensure personnel read and comply with appropriate MSDS.
3. Communicate good environmental ethics to subordinates.
  - a. Train subordinates to identify the environmental impact of missions.
  - b. Counsel subordinates on the importance of protecting the environment and the consequences of not complying with environmental laws and regulations.
  - c. Incorporate environmental considerations in AARs.
  - d. Ensure subordinates are familiar with local, state, federal, and HN environmental laws that apply to them, as well as local unit SOPs and policies.
4. Identify environmental risks associated with given missions prior to conducting the mission.
5. Identify and conduct environmentally sustainable actions and training. In the absence of specific guidance, do what is morally right with regard to environment.
6. Ensure hazardous substances are stored and turned-in in accordance with local policy and applicable environmental regulations.

**Performance Steps**

7. Ensure proper conservation of resources.
  - a. Ensure hazardous materials are ordered and stored in minimum quantities needed for mission.
  - b. Ensure support for unit recycling program.
  - c. Employ techniques to avoid overusing or polluting training land, waterways, air, and other frequently used training resources.
8. Ensure appropriate equipment is on hand for hazardous materials spills containment and cleanup prior to beginning of any operation.
9. Ensure personnel conducting an operation are trained in proper use of spill cleanup and containment equipment and employ proper procedures in accordance with FRP and SPCC plan.
10. Ensure petroleum spills generated by operations are cleaned up immediately and reported in accordance with FRP and SPCC plan.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Verified applicable MSDS are maintained.	—	—
3. Communicated good environmental ethics to subordinates.	—	—
4. Identified environmental risks associated with given missions prior to conducting the mission.	—	—
5. Identified and conducted environmentally sustainable actions and training. In the absence of specific guidance, do what is morally right with regard to the environment.	—	—
6. Ensured hazardous substances are stored and turned-in in accordance with local policy and applicable environmental regulations.	—	—
7. Ensured proper conservation of resources.	—	—
8. Ensured appropriate equipment is on hand for hazardous materials spills containment and cleanup prior to beginning of any operation.	—	—
9. Ensured personnel conducting an operation are trained in proper use of spill clean up and containment equipment and employ proper procedures in accordance with FRP and SPCC plan.	—	—
10. Ensured petroleum spills generated by operations are cleaned up immediately and reported in accordance with FRP and SPCC plan.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

<b>Required</b>	<b>Related</b>
FM 3-100.12	
FM 3-100.4	



## Subject Area 10: DIRECTING TANK VEHICLES

**Direct Petroleum Waterborne Operations****101-92F-3166**

**Conditions:** Given the requirement to direct water front fueling operations in a field environment. Personnel and materials required to perform task: three military occupational specialty (MOS)-qualified (92F) Soldiers; waterborne petroleum tanker and facilities, risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE), communication equipment, unit standing operating procedure (SOP), Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, a partially completed DD Form 250-1 (Tanker/Barge Materiel Inspection and Receiving Report), and applicable reference materials.

**Standards:** Prepare operations order (OPORD) and direct loading or unloading of waterborne barges and tankers without commingling of products, injury to personnel, damage to equipment, or pollution of the environment.

**Performance Steps****DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Implement environmental stewardship measures according to critical task 101-92F-3312.
3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with OPORDs, unit standing operating procedures (SOPs), and specific guideline that pertains to task or mission.
  - a. Ensure personnel understand mission or task on hand.
    - (1) Individual tasks or specific role of every personnel to accomplish mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risk involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous waste/hazardous material (HW/HM) management and environmental hazards.
  - f. Discuss specific guideline that pertains to loading or unloading of waterborne barges and tankers.
    - (1) Mooring of vessels
    - (2) Fire fighting and pollution control equipment
    - (3) Vessels inspection procedures
    - (4) Petroleum product quality surveillance
    - (5) Accountability procedures and forms

## Performance Steps

4. Conduct Pre-Combat Checks and Pre-Combat Inspections.
  - a. Inspect personnel uniforms and equipment for serviceability and in conformity to the mission, weather, or environment.
  - b. Check that appropriate PPE is on hand.
  - c. Check operator license, dispatch, and preventive maintenance checks and services (PMCS) records.
  - d. Check reference materials required (TM, FM, SOP) are available.
  - e. Check communications equipment and personnel knowledge on Communication-Electronics Operating Instructions (CEOI).
  - f. Check availability of precautionary and safety measures or warning devices.
5. Maintain communications with lower and higher echelon and render reports as required.
6. Identify training and cross-training for all personnel to include licensing for section's equipment
7. Project maintenance and repair requirements.
8. Prepare operations order for loading and unloading tanker. Include as a minimum the following information elements:
  - a. Estimated time of arrival.
  - b. Kind and amount of petroleum product to be loaded or unloaded.
  - c. Type of vessel.
  - d. Berth to be used.
  - e. Pipelines to be used
  - f. Number and size of hoses to be connected
  - g. Tanks into which cargo is to be received.
  - h. Pump stations and pumps to be used.
  - i. Tank and cargo layout.
  - j. Number of samples to be taken and the location to which samples are to be sent.
  - k. Tests required.
    - l. Ballast carried or required at the terminal.
  - m. Location of blends, if used.
  - n. Line cleaning or displacement.
  - o. Pumping facilities aboard the vessel.
  - p. Line cleaning or displacement.
  - q. Any special services or unusual requirements, such as blending of FSII, additional lighting, or use of spill booms.
9. Notify customs and health authorities before the tanker arrives.
10. Notify dock personnel of arrival and departure times.
11. Notify harbor master of arrival and departure times.
12. Ensure customs and health authorities have inspected and cleared foreign vessels for boarding prior to beginning operations.
13. Ensure personnel involved in the operation are briefed on safety and environmental considerations prior to beginning operations.
14. Ensure appropriate fire-fighting and pollution control equipment is on hand and personnel are familiar with their use prior to beginning operations.
15. Ensure vessel is properly moored.
16. Ensure connecting hoses are serviceable.
17. Ensure shore and vessel tanks are inspected, sampled, and gauged.

**Performance Steps**

- 18. Ensure loading and unloading operations are conducted and completed.
- 19. Ensure seals are installed on tanks after tanker is loaded and seal numbers annotated on DD Form 250-1.
- 20. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensured personnel were knowledgeable on Concept of Operation in accordance with OPODs, unit standing operating procedures (SOPs), and specific guideline that pertained to task or mission.	—	—
4. Conducted Pre-Combat Checks and Pre-Combat Inspections.	—	—
5. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
6. Identified training and cross-training for all personnel to include licensing for section's equipment.	—	—
7. Projected maintenance and repaired requirements.	—	—
8. Prepared operations order for loading and unloading tanker.	—	—
9. Notified customs and health authorities before the tanker arrives.	—	—
10. Notified dock personnel of arrival and departure times.	—	—
11. Notified harbor master of arrival and departure times.	—	—
12. Ensured customs and health authorities have inspected and cleared foreign vessels for boarding prior to beginning operations.	—	—
13. Ensured personnel involved in the operation are briefed on safety and environmental considerations prior to beginning operations.	—	—
14. Ensured appropriate fire-fighting and pollution control equipment is on hand and personnel are familiar with their use prior to beginning operations.	—	—
15. Ensured vessel is properly moored.	—	—
16. Ensured connecting hoses are serviceable.	—	—
17. Ensured shore and vessel tanks are inspected, sampled, and gauged.	—	—
18. Ensured loading and unloading operations are conducted and completed.	—	—
19. Ensured seals are installed on tanks after tanker is loaded and annotated on DD Form 250-1.	—	—
20. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DD FORM 250-1  
DOD 4140.25-M  
FM 10-67-1

**Related**

AR 200-1  
FM 100-14  
FM 3-100.12  
FM 3-100.4

## Direct Unit Maintenance Within The Army Maintenance Management System (TAMMS)

### 101-92F-3302

**Conditions:** Given the requirement to direct a maintenance program in a field environment. Personnel and materials required to perform task: four 92F military occupational specialty (MOS)-qualified Soldiers; tactical and/or commercial-type vehicles, unit maintenance operating procedures and all applicable reference materials.

**Standards:** Direct operator maintenance and operation of assigned vehicles and equipment to ensure they are mission capable and operated according to traffic, equipment operating procedures, and safety regulations.

#### Performance Steps

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with operations order (OPORD), unit standing operating procedures (SOP), and specific guideline that pertains to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous waste/hazardous material (HW/HM) management and environmental hazards.
  - f. Discuss specific guideline that pertains to unit maintenance (refer to unit maintenance SOP).
3. Ensure operators are trained and licensed on their assigned vehicle or equipment required for them to operate.
4. Verify precautionary and safety data on vehicles and equipment (flammable, service date, no smoking, and so on).
5. Ensure all assigned equipment has appropriate technical manuals (TMs) and lubrication orders (LOs).
6. Ensure data entered on historical maintenance records are correct and match data associated with assigned equipment.
7. Ensure proper equipment dispatch procedures are followed and DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)) are filled out correctly.
8. Ensure during- and after-operations PMCS is performed on equipment and annotated properly on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E.
9. Ensure operators and crews repair maintenance faults that they are able to correct.

**Performance Steps**

10. Ensure operators and crew coordinate for maintenance support for maintenance faults that they cannot correct.
11. Spot-check operator and crew maintenance procedures.
12. Ensure maintenance is conducted within guidelines of applicable environmental laws, regulations, and procedures.
13. Perform follow-up checks on deferred maintenance and parts orders to ensure action occur.
14. Ensure assigned equipment receives periodic services as scheduled.
15. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Conducted briefing and ensured personnel are knowledgeable on Concept of Operations.	—	—
3. Ensured personnel were trained and licensed on vehicle or equipment they were required to operate.	—	—
4. Verified precautionary and safety data on vehicles and equipment (flammable, service date, no smoking, and so on).	—	—
5. Ensured all assigned equipment had appropriate technical manuals (TMs) and lubrication orders (LOs).	—	—
6. Ensured data entered on historical maintenance records was correct and matched data associated with assigned equipment.	—	—
7. Ensured proper equipment dispatch procedures were followed and DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)) were filled out correctly.	—	—
8. Ensured during- and after-operations PMCS was performed on equipment and annotated properly on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)).	—	—
9. Ensured operators and crews repaired maintenance faults that they were able to correct.	—	—
10. Ensured operators and crews coordinated for maintenance support for maintenance faults that they could not correct.	—	—
11. Spot-checked operator and crew maintenance procedure.	—	—
12. Ensured maintenance was conducted within guidelines of applicable environmental laws, regulations, and procedures.	—	—
13. Performed follow up checks on deferred maintenance and parts orders to ensure actions occurred.	—	—

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
14. Ensured assigned equipment received periodic services as scheduled.	—	—
15. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all steps are passed. Score the Soldier NO-GO if any steps are failed. If the Soldier scores NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
 DA FORM 5987-E  
 DA FORM 5988-E  
 DA PAM 750-8  
 DD FORM 1970

**Related**

FM 3-100.12  
 FM 3-100.4

## Direct Refuel on the Move (ROM) Operations

101-92F-3311

**Conditions:** Given the requirement to supervise fueling operations in a field environment. Personnel and materials required to perform task: nine military occupational specialty (MOS)-qualified (92F) Soldiers; petroleum tank vehicles, a mission operations order (OPORD), a ROM kit, a source of re-supply, risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE), an area at least 550 feet long by 150 feet wide, Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; unit hazardous waste/hazardous material (HW/HM) management policy; unit standing operating procedure (SOP); oral or written OPORD; DA Form 3643 (Daily Issues of Petroleum Products), DA Form 2765-1 (Request for Issue or Turn-in), DA Form 3644 (Monthly Abstract of Issues of Petroleum Products and Operating Supplies), and full access to all reference materials. The area is secure and no enemy contact is expected. Vehicles to be refueled are on hand.

**Standards:** Direct ROM operations ensuring safety, fuel accountability, and customer supports are provided according to OPORD without damage to equipment or injury to personnel or of the environment.

### Performance Steps

#### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

#### WARNING

**Due to safety considerations, normal vehicle refueling is done with the engine off. AR 385-55 states that commanders will apply all normal safety standards to their operations unless it is necessary to change do to the mission. In training situations, changes may be authorized only by the commander. Commanders will evaluate the significance of the assumed risk versus the training benefit. In combat operations, commanders will make decisions based on Mission, Enemy, Terrain, Troops and Time Available (METT-T) and risk analysis.**

NOTE: Fueling or defueling will be suspended when electrical storms are within a 3-mile radius of such operations.

1. Apply risk management procedures.
  - a. Understand and implement risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to chain of command.
  - c. Monitor and evaluate execution of risk controls and incorporate into after action reviews (AARs).
2. Implement environmental stewardship measures according to critical task 101-92F-3312.



## Performance Steps

3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with OPORD, unit SOP, and specific guidelines that pertains to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish the mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous materials/wastes management and environmental hazards.
  - f. Discuss specific guideline that pertains to Refuel on the Move Operations.
    - (1) Signals used to start and stop operations, and coordinating vehicle serials to and from holding area.
    - (2) Prescribed amount of fuel received and time allocated for each vehicle.
    - (3) Accounting for product.
4. Conduct Pre-combat Checks and Pre-combat Inspections.
  - a. Inspect personnel uniforms and equipment for serviceability and in conformity to mission, weather, or environment.
  - b. Check appropriate PPE is on hand.
  - c. Check operator license, dispatch, and preventive maintenance checks and services (PMCS) records.
  - d. Check load plans ensure all equipment is packed to complete mission.
  - e. Check applicable reference materials and fuel accountability forms.
  - f. Inspect communication equipment and personnel knowledge on communication procedures and operating instructions.
5. Maintain communications with lower and higher echelon and render reports as required.
6. Identify training and cross-training for all personnel to include licensing for section's equipment.
7. Project maintenance and repair requirements.
8. Prepare a ROM operation. As a minimum, prepare for the following items within the scope of OPORDs or Fragmentary Orders (FRAGOs):
  - a. Entrance and exit marshaling areas for vehicles.
  - b. Traffic control and movement plan for vehicles being refueled and movement of fuel tankers into and out of site (if required by type of ROM being established).
  - c. A contingency plan if a pump, filter separator, or fuel source is rendered non-operational.
  - d. Site layout for equipment used to optimize security, use of natural cover and concealment, and ease of movement into and out of site for vehicles being refueled and fuel re-supply vehicles.
    - (1) Choose highest ground possible so that vapors will not collect.
    - (2) Avoid laying out system near bodies of water to avoid contamination.
    - (3) Use vacated forward sites or existing facilities if possible.
    - (4) Location is away from populated area.
    - (5) Do not set up upstream of troop concentrations.
  - e. A communications plan which addresses communications with units entering and exiting ROM site (radio preferred), status reporting, and re-supply operations for site (radio preferred). Also plan a signal system for controlling movement of vehicles within site and operation of ROM during daylight or night operations. Arm and hand signals, flags, hand held radios, chemical lights, flashlights, or any other feasible method may be used.
9. Perform reconnaissance of site selected by supervisor.
10. Ensure appropriate equipment for operation is on hand and serviceable.
11. Assign appropriate number of personnel to conduct mission.

**Performance Steps**

12. Establish ROM site according to unit tactical SOP and appropriate FM/TMs.
  - a. Verify that appropriate fuel stocks required to operate ROM site are transported to location given for site.
  - b. Verify grounding rods, grounding connections, and bonding hook ups are serviceable and ready for operations.
  - c. Verify that fire extinguishers meet appropriate standards and are located at each refueling point and at tanker/pump unit.
  - d. Verify that sufficient water available to provide first aid measures, if required.
  - e. Verify that there are explosion-proof flashlights available for night operations.
  - f. Verify that NO SMOKING signs have been posted.
13. Ensure PMCS is performed.
14. Inform your chain of command when site is fully operational.
15. Control operation of a ROM site according to OPORD and unit tactical SOP.
  - a. Maintain communications with your chain of command and customer units to monitor status of units moving in and out of site and to assist smooth flow of vehicles in and out of site. Report any deviations in refueling schedule to supervisor.
  - b. Ensure operators adhere strictly to refuel criteria established in OPORD for mission.
  - c. Monitor fuel stocks and accountability procedures. Render status reports as required by unit procedures to supervisor.
  - d. Ensure site is operated according to OPORD and unit tactical SOP.
16. Dispose of contaminated fuel and materials in an environmentally safe manner according to unit policies and procedures and applicable environmental laws.
17. Verify that all equipment is inventoried, cleaned, and stored and that all equipment that is non-mission capable (NMC) is replaced or fixed before equipment is stored.
18. Ensure accountability of fuel using DA Form 3643. Post summarized information from DA Form 3643 to DA Form 3644 to show total monthly issues and receipts. Forward to responsible centralized stock accounting section for accounting record adjustment.
19. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensured personnel were knowledgeable on Concept of Operations.	—	—
4. Conducted Pre-Combat Checks and Pre-Combat Inspections.	—	—
5. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
6. Identified training and cross-training for all personnel to include licensing for section's equipment.	—	—
7. Projected maintenance and repaired requirements.	—	—
8. Prepared a ROM operation.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
9. Performed reconnaissance of site selected by supervisor.	—	—
10. Ensured appropriate equipment for operation is on hand and serviceable.	—	—
11. Assigned appropriate number of personnel to conduct mission.	—	—
12. Established a ROM site according to unit tactical SOP and appropriate FM/TMs.	—	—
13. Ensured PMCS was performed.	—	—
14. Informed chain of command when site was fully operational.	—	—
15. Controlled operation of ROM site according to OPORD and unit tactical SOP.	—	—
16. Disposed of contaminated fuel and materials in an environmentally safe manner according to unit policies and procedures and applicable environmental laws.	—	—
17. Verified that all equipment was inventoried, cleaned, and stored and that all equipment that is non-mission capable (NMC) was replaced or fixed before equipment is stored.	—	—
18. Ensured accountability of fuel using DA Form 3643. Posted summarized information from DA Form 3643 to DA Form 3644 to show total monthly issues and receipts. Forwarded to responsible centralized stock accounting section for accounting record adjustment.	—	—
19. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

<b>Required</b>	<b>Related</b>
DA FORM 3643	FM 10-1
DA FORM 3644	
FM 10-67-1	
FM 3-100.12	
FM 3-100.4	
TM 9-2330-330-14&P	
TM 9-2330-398-10	

## Direct Petroleum Tank Vehicle Operations

### 101-92F-3313

**Conditions:** Given the requirement to direct the loading and dispensing of petroleum products from tank vehicles in a field environment. Personnel and materials required to perform task: eight military occupational specialty (MOS)-qualified (92F) Soldiers; appropriate type and number of mission capable petroleum tankers, oral or written operations order (OPORD) for petroleum loading and dispensing operations, unit standing operating procedure (SOP), tank vehicle conversion chart, Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required), spill containment and cleanup equipment, tank-cleaning equipment and supplies, appropriate personal protective equipment (PPE), fire extinguishers, risk management procedures, DA Form 2765-1 (Request for Issue or Turn-in), DA Form 3643 (Daily Issues of Petroleum Products), DA Form 3644 (Monthly Abstract of Issues of Petroleum Products and Operating Supplies), DD Form 1348-1A (Issue Release/Receipt Document), appropriate Material Safety Data Sheets (MSDS), and all reference materials.

**Standards:** Direct loading and dispensing of products from assigned vehicles, fuel accountability, and quality surveillance without injury to personnel, damage to equipment, or of the environment.

#### Performance Steps

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Implement environmental stewardship measures according to critical task 101-92F-3312.
3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with OPORD, unit SOP, and specific guidelines that pertains to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish the mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous waste/hazardous material (HW/HM) management and environmental hazards.
  - f. Discuss specific guideline that pertains to Tank Vehicle Operations.
4. Conduct Pre-combat Checks and Pre-combat Inspections.
  - a. Inspect personnel uniforms and equipment for serviceability and in conformity to mission, weather, or environment.
  - b. Check that appropriate PPE is on hand.
  - c. Check operator license, dispatch, and preventive maintenance checks and services (PMCS) records.
  - d. Inspect communication equipment and personnel knowledge on communication procedures and operating instructions.
  - e. Check that paper work for filter effectiveness is current and within standards.
  - f. Inspect appropriate reference materials (TM, FM, SOP, OPORD) required are available.

**Performance Steps**

5. Maintain communications with lower and higher echelon and render reports as required.
  - a. Maintain communication (Movement Tracking System [MTS]) with higher HQ at all times. Provide reports as required by OPORD and unit tactical SOP.
  - b. Ensure personnel maintain status of product on hand in MTS as required by OPORD.
6. Identify training and cross-training for all personnel to include licensing for section's equipment.
7. Project maintenance and repair requirements.
8. Assign appropriate personnel and equipment to accomplish mission.
9. Enforce unit preventative maintenance objectives according to unit tactical SOP.
  - a. Review DA Forms 2404 daily.
  - b. Check that PMCS is being performed.
  - c. Check that direct support/general support (DS/GS) maintenance is scheduled when required.
10. Ensure vehicles are marked appropriately for type of product they are carrying in accordance with unit policies and applicable environmental regulations.
11. Ensure vehicle tanks are clean. Tanks should be cleaned if any of the following conditions exist:
  - a. When condition of tanks results in contaminated fuel.
  - b. When fuels have been mixed through carelessness.
  - c. When sediment and water accumulate in bottom of tank.
  - d. When changing type of fuel to be transported.
  - e. When required for maintenance.
12. Verify that fuel was visually checked for color, clarity, and contamination.
  - a. Visual examination.
  - b. API gravity test (Aqua-Glo test if for aviation).
13. Ensure operations are conducted according to unit tactical SOP's, FM 10-67-1, and appropriate TMs.
14. Observe operations for safety and environmental violations. Take appropriate actions if any violations are found.
15. Provide status reports as required by local policies and unit tactical SOP's.
16. Ensure accountability of fuel using DA Form 3643 and DA Form 2765-1. Post summarized information from DA Form 3643 to DA Form 3644 to show total monthly issues and receipts. Forward to responsible centralized stock accounting section for accounting record adjustment.
17. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensured personnel were knowledgeable on Concept of Operations.	—	—
4. Conducted pre-combat checks and pre-combat inspections.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
5. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
6. Identified training and cross-training for all personnel to include licensing for section's equipment.	—	—
7. Projected maintenance and repaired requirements.	—	—
8. Assigned appropriate personnel and equipment to accomplish mission.	—	—
9. Enforced unit preventative maintenance objectives according to unit tactical SOP.	—	—
10. Ensured vehicles are marked appropriately for type of product they are carrying in accordance with unit policies and applicable environmental regulations.	—	—
11. Ensured vehicle tanks are clean.	—	—
12. Verified that fuel was visually checked for color, clarity, and contamination.	—	—
13. Ensured operations are conducted according to unit tactical SOP's, FM 10-67-1, and appropriate TMs.	—	—
14. Observed operations for safety and environmental violations. Stop operations if any violations are found.	—	—
15. Provided status reports as required by local policies and unit tactical SOP's.	—	—
16. Ensured accountability of fuel using DA Form 3643 and DA Form 2765-1. Posted summarized information from DA Form 3643 to DA Form 3644 to show total monthly issues and receipts. Forwarded to responsible centralized stock accounting section for accounting record adjustment.	—	—
17. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all steps are passed. Score the Soldier NO-GO if any steps are failed. If the Soldier scores NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2765-1  
DA FORM 3643  
DA FORM 3644  
DD FORM 1348-1A  
FM 10-67-1

**Related**

AR 200-1  
DA PAM 750-8  
FM 3-100.12  
FM 3-100.4  
TM 10-4320-310-14  
TM 10-4320-351-14  
TM 10-4330-237-13&P  
TM 10-4930-204-13  
TM 10-4930-229-12&P  
TM 10-4930-236-13&P  
TM 10-4930-250-13&P  
TM 11-5825-291-13  
TM 5-4330-217-12  
TM 5-4930-237-10  
TM 9-2320-279-10-1  
TM 9-2320-361-10  
TM 9-2330-272-14  
TM 9-2330-356-14  
TM 9-2330-398-10

## Direct Petroleum Rail Tank Car Operations

101-92F-3314

**Conditions:** Given the requirement to direct loading and unloading of petroleum products from rail tank cars in a field environment. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers; petroleum rail tank car and petroleum tank vehicles, fire extinguishers, risk management procedures, Material Safety Data Sheets (MSDS), unit standing operating procedure (SOP), Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, personnel protective equipment (PPE), spill kit/containment and cleanup equipment, DD Form 1348-1A (Issue Release/Receipt Document), DD Form 250 (Materiel Inspection and Receiving Report), DD Form 250-1 (Tanker/Barge Materiel Inspection and Receiving Report), and full access to all applicable reference materials.

**Standards:** Direct loading and unloading procedures for rail cars operations, fuel accountability, and quality surveillance without injury to personnel, damage to equipment, or pollution of the environment.

### Performance Steps

#### **DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL. WEAR THE APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (SUCH AS FACE SHIELD/GOGGLES AND CHEMICAL GLOVES) AS IDENTIFIED IN THE APPLICABLE REFERENCES (MSDS).**

#### **CAUTION**

Before performing this task read and comply with the appropriate MSDS.

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Implement environmental stewardship measures according to critical task 101-92F-3312.
3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with operations order (OPORD), unit SOP, and specific guidelines that pertain to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish the mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous waste/hazardous material (HW/HM) management and environmental hazards.



**Performance Steps**

- f. Discuss specific guideline that pertains to Rail Tank Car Operations.
4. Conduct Pre-Combat Checks and Pre-Combat Inspections.
    - a. Inspect personnel uniforms and equipment for serviceability and in conformity to mission, weather, or environment.
    - b. Check that appropriate PPE is worn.
    - c. Check operator license, dispatch, and preventive maintenance checks and services (PMCS) records.
    - d. Check equipment inventory to ensure component parts or systems are complete.
    - e. Check reference materials required (TM, FM, SOP) are available.
    - f. Check filter effectiveness test results. Ensure it is current and within specifications.
    - g. Check communications equipment and personnel knowledge on communication procedures and operating instructions.
  5. Maintain communications with lower and higher echelon and render reports as required.
  6. Identify training and cross-training for all personnel to include licensing for section's equipment.
  7. Project maintenance and repair requirements.
  8. Ensure precautionary and safety measures (NO SMOKING, ONE WAY TRAFFIC) are posted and enforced.
  9. Select site for rail tank car loading and unloading within the area of operations in accordance with OPORD, SOP, and directives. Consider a spur or bypass rail line:
    - a. Has adequate drainage.
    - b. Avoid area that will confine vapors.
    - c. If tank cars are to be loaded by gravity, loading site must be below supply container.
    - d. If tank cars are to be unloaded by gravity, site must be elevated enough to have proper flow at receiving container.
    - e. The track at site should be level to ensure accurate gauge reading and to prevent air from being trapped at one end of tank when dome is closed.
    - f. If a tank truck is used to load or unload a tank car, it should be grounded to one or more ground rods to guard against static electricity or stray current.
    - g. A grounding cable should be permanently bolted between the track rails.
    - h. Derails, which are wedge-shaped devices of wood or metal, should be placed at the head of the car.

NOTE: Derails will prevent other cars from backing into the tank car during transfer operations. Also, they are placed on the rails to prevent the tank car from rolling.

10. Ensure appropriate equipment for loading and unloading operations are on hand and serviceable.
 

NOTE: Where more than one filling point is used, loading racks should be spaced to allow several cars to be loaded at one time.

  - a. Ensure that each filling point has grounding and bonding cables for bonding the filling point to tank car shell and track.

NOTE: Bond and ground the car with a minimum of four cables.

  - b. Ensure loading arm hose is long enough to reach the bottom of the tank car.
  - c. Ensure emergency valve is located some distance from rack so that line can be cut off in case of fire at loading rack.
  - d. Ensure distribution manifolds consisting of necessary piping and valves, extends along the loading rack and provides outlets for loading and unloading several cars at one time. Hose lengths should be provided to permit loading cars through dome.
  - e. Manifolds must be grounded and equipped with cable for bonding the manifold to track and tank car.

**Performance Steps**

- f. Ensure electrical equipment operating in area such as lights, switches, and motors, must be of explosion proof construction and must be in good working condition.
  - g. Ensure a wooden cone-shaped plug, suitable for plugging the bottom outlet of tank car is on site and available in case of a emergency.
  - h. Check derails they must be set and locked or operated so that they furnish the protection intended.
  - i. Ensure pump assembly is position a minimum of 50 feet from rail car.
11. Ensure appropriate personnel are on hand to perform mission.
  12. Prepare a delivery schedule for receipt of product.
  13. Ensure operations are conducted according to unit SOP's, FM 10-67-1, DA Pamphlet 710-2-2, and MIL-STD-3004A.
    - a. Ensure rail tank car are clean prior to operation. Tanks should be cleaned if any of the following conditions exist:
      - (1) When condition of tanks results in contaminated fuel.
      - (2) When fuels have been mixed through carelessness.
      - (3) When sediment and water accumulate in bottom of tank.
      - (4) When changing type of fuel to be transported.
      - (5) When required for maintenance.
    - b. Ensure communications between pump station operator and rail tank car transfer (filling point) operator.
    - c. Ensure that product last carried by tank car is the same as product being transferred into tank.
    - d. Ensure identification seal is place on dome cover and recorded on shipping documents.
- NOTE: Identification seal must be an approved seal, one which cannot be removed without being destroyed.
- e. Check for tampering, review shipping documents and initiate receipt of petroleum products.
  - f. Check sampling and gaging results ensure products meet specifications prior to transfer.
  - g. Observe operations for safety and environmental violations. Take appropriate action(s) immediately if violations occur to correct the problem.
14. Provide status reports as required by the local policy and unit SOP's.
  15. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensure personnel are knowledgeable on Concept of Operations.	—	—
4. Conducted Pre-Combat Checks and Pre-Combat Inspections.	—	—
5. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
6. Identified training and cross-training for all personnel to include licensing for section's equipment.	—	—
7. Projected maintenance and repaired requirements.	—	—
8. Ensured precautionary and safety measures were posted and enforced.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
9. Selected site for rail tank car loading and unloading.	—	—
10. Ensured appropriate equipment for loading and unloading operations was on hand and serviceable.	—	—
11. Ensured appropriate personnel were on hand to perform mission.	—	—
12. Prepared a delivery schedule for receipt of product.	—	—
13. Ensured operations are conducted according to unit SOP's, FM 10-67-1, DA Pamphlet 710-2-2, and MIL-STD-3004A.	—	—
14. Provided status reports as required by the local policy and unit SOP's.	—	—
15. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all steps are passed. Score the Soldier NO-GO if any steps are failed. If the Soldier scores NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

- DA PAM 710-2-2
- DD FORM 1348-1A
- DD FORM 250
- DD FORM 250-1
- FM 10-67-1
- FM 3-100.12
- FM 3-100.4

**Related**

- MIL-HDBK-1022A
- TM 10-4320-343-14
- TM 10-4930-247-13&P

## Direct HEMTT Tanker Aviation Refueling System (HTARS) Operations

**101-92F-3317**

**Conditions:** Given the requirement to provide aviation refueling support on a fixed airstrip or pre-designated field location. Personnel and materials required to perform task: five military occupational specialty (MOS)-qualified (92F) Soldiers; one MOS 93H or pathfinder personnel that have required Air Traffic Control (ATC) skills; risk management procedures, Heavy Extended Mobility Tactical Truck (HEMTT) tanker, HEMTT Tanker Aviation Refueling System (HTARS) system, fire extinguishers, spill containers/clean-up materials, personal protective equipment (PPE), appropriate Material Safety Data Sheet (MSDS) or Hazardous Material Information Sheet (HMIS), radios; Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP) (if required); the unit hazardous waste/hazardous material (HW/HM) management policy; unit standing operating procedure (SOP) on aviation refueling operations; oral or written operations order (OPORD); DA Form 3643 (Daily Issues of Petroleum Products); DA Form 3644 (Monthly Abstract of Issues of Petroleum Products and Operating Supplies); DD Form 1898 (Fuel Sale Slip), and full access to all applicable reference material.

**Standards:** Direct the placement and assembly of HTARS by ensuring the site is suitable, accountability and fuel quality are maintained, and refueling operations are performed without injury to personnel, damage to equipment or pollution of the environment.

### Performance Steps

1. Apply risk management procedures.
  - a. Understand and implement risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with OPORD, unit SOP, and specific guidelines that pertains to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish the mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. HW/HM management and environmental hazards.
  - f. Discuss specific guideline that pertains to HEMTT Tanker Aviation Refueling System.
    - (1) Night operations
    - (2) Orientation of site
    - (3) Approach of aircraft
    - (4) Hand and Arm signals

(SAFETY: Do not be in front of armed aircraft at any time).

  - (5) Marshalling area
  - (6) Quality surveillance
3. Conduct Pre-Combat Checks and Pre-Combat Inspections.
4. Maintain communications with lower and higher echelon and render reports as required.
5. Identify training and cross-training for all personnel to include licensing for section's equipment.
6. Project maintenance and repair requirements.

## Performance Steps

7. Ensure appropriate equipment for operation is on hand and serviceable.
8. Select appropriate area to conduct aviation refueling operations, within scope of operations order. Conduct a reconnaissance by ground or air consider the following areas:
  - a. Select area with enough room to accommodate fueling mission. Request engineer support for obstacle removal and site improvement.
  - b. Determine wind direction and the type of aircraft to be refueled. Select area that provides approach, fueling, and take off with a head wind or cross wind.
  - c. Select operation on high grounds to prevent any fuel vapors from collecting around operation.
  - d. Select area that will provide natural concealment during operation.
  - e. Select area away from stream or river.
  - f. Designate holding areas for awaiting aircraft.
  - g. Designate passenger marshalling area. The marshalling area should be at 5 o'clock position of sight. Approach direction at 12 o'clock.
  - h. Designate perimeter and fighting positions.
  - i. Sweep site for NBC contamination.
9. Ensure system is setup and ready for aviation refueling operations in accordance with unit tactical SOP and appropriate field manuals/technical manuals (FM/TMs).
  - a. Verify grounding rods, grounding connections, and bonding hook ups are serviceable and ready for operations.
  - b. Verify that fire extinguishers meet appropriate standards and are located at each refueling point and at HEMTT tanker.
  - c. Verify that sufficient water available to provide first aid measures, if required.
  - d. Verify that there are explosion-proof flashlights available for night operations.
  - e. Verify that NO SMOKING, DANGER, PASSENGER MARSHALLING AREA, EMERGENCY SHUT OFF, RESTRICTED AREA, and ALARM signs have been posted.
  - f. Verify that marshalling area is designated and marked.
  - g. Verify that selected site is cleared of all loose debris that could cause damage to aircraft or injury to personnel.
  - h. Verify that system been pressure tested prior to operations.
  - i. Verify that perimeter has been established and fighting positions are prepared along with range cards.
10. Ensure preflight quality surveillance is performed.
  - a. Verify that HTARS system is flushed with at least five gallons of fuel through each point and sample is taken and recorded. Leave sample in drip pan at each point and at each HEMTT so that any pilot can see the sample on request.
11. Ensure preventive maintenance checks and services (PMCS) are performed.
12. Inform chain of command when site is operational.
13. Maintain communication with chain of command. Report status of operation and any problems encountered as required by unit SOP.
14. Conduct dispensing operations in accordance with unit SOP and applicable reference materials.
  - a. Establish communication with air traffic control and refueling aircraft. Designate landing pad for aircraft as they approach refueling operations.
  - b. Monitor personnel procedures during and after refueling operations.
  - c. Observe site for safety and environmental infractions. Take appropriate actions if any infractions are detected to correct it.
  - d. Ensure all passengers on board aircraft but pilot leave air craft during re fueling operations. Have passengers escorted to Marshalling area.

**Performance Steps**

- e. Ensure spills are cleaned up, reported as required by unit policies, procedures, and applicable environmental laws.
- 15. Dispose of contaminated fuel and materials in an environmentally safe manner according to unit SOP, policies, procedures, and applicable environmental laws.
- 16. Verify that all equipment is inventoried, cleaned, and stored and that all equipment that is non-mission capable (NMC) is replaced or fixed before equipment is stored.
- 17. Ensured accountability of fuel using DA Form 3643. Post summarized information from DA Form 3643 to DA Form 3644 to show total monthly issues and receipts. Forward to responsible centralized stock accounting section for accounting record adjustment.
- 18. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Conducted briefing and ensured personnel were knowledgeable on Concept of Operations.	—	—
3. Conducted Pre-Combat Checks and Pre-Combat Inspections.	—	—
4. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
5. Identified training and cross-training for all personnel to include licensing for section's equipment.	—	—
6. Projected maintenance and repaired requirements.	—	—
7. Ensured appropriate equipment for operation was on hand and serviceable.	—	—
8. Selected appropriate area to conduct aviation refueling operations, within the scope of the operations order, and site recon.	—	—
9. Ensured system is setup and ready for aviation refueling operations IAW unit tactical SOP and appropriate FMs/TMs.	—	—
10. Ensured preflight quality surveillance is performed.	—	—
11. Ensured preventive maintenance checks and services (PMCS) were performed.	—	—
12. Informed chain of command when site was operational.	—	—
13. Maintained communication with chain of command. Report status of operation and any problems encountered as required by unit SOP or OPORD.	—	—
14. Conducted dispensing operations in accordance with unit SOP and appropriate FM/TMs.	—	—
15. Disposed of contaminated fuel and materials in an environmentally safe manner according to unit SOP, policies, procedures, and applicable environmental laws.	—	—
16. Verified that all equipment was inventoried, cleaned, and stored and that all equipment that is non-mission capable (NMC) is replaced or fixed before equipment is stored.	—	—

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
17. Ensured fuel accountability records and reports are maintained. Forwarded to responsible centralized stock accounting section for accounting record adjustment.	—	—
18. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all steps are passed. Score the Soldier NO-GO if any steps are failed. If the Soldier scores NO-GO, show what was done wrong and how to do it correctly.

**References**

<b>Required</b>	<b>Related</b>
DA FORM 3643	
DA FORM 3644	
DD FORM 1898	
FM 10-67-1	
FM 3-04.111	
FM 3-100.12	
FM 3-100.4	
TM 5-4930-237-10	
TM 9-2320-279-10-1	

## Subject Area 11: DIRECTING CLASS III OPERATIONS

**Direct Forward Area Refueling Equipment (FARE) Operations****101-92F-3215**

**Conditions:** Given the requirement to provide aviation refueling support on a fixed airstrip or predestinated field location. Personnel and materials required to perform task: five military occupational specialty (MOS)-qualified (92F) Soldiers and one MOS-qualified (93H) or pathfinder personnel that have required Air Traffic Control (ATC) skills; Forward Area Refueling Equipment (FARE) system, operational fuel blivets, risk management procedures, applicable Material Safety Data Sheet (MSDS), personal protection equipment (PPE), appropriate communications system, spill kit/containers, Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required), the unit hazardous waste/hazardous material (HW/HM) management policy, and oral or written operations order (OPORD), unit standing operating procedure (SOP) on aviation refueling operations, DA Form 3643 (Daily Issues of Petroleum Products), DA Form 3644 (Monthly Abstract of Issues of Petroleum Products and Operating Supplies), and full access to all reference material.

**Standards:** Direct placement and assembly of FARE system by ensuring the site is suitable for refueling operations, fuel accountability, and quality surveillance are performed without injury to personnel, damage to equipment, or pollution of the environment.

**Performance Steps****DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Implement environmental stewardship measures according to critical task 101-92F-3312.
3. Conduct briefing and ensure personnel are knowledgeable on concept of operation in accordance with OPORD, unit SOP, and specific guidelines that pertains to task or mission.
  - a. Ensure personnel understand the mission or task at hand.
    - (1) Individual task or specific role of every personnel to accomplish mission.
    - (2) Collective task that a group needs to perform to support mission.
  - b. Explain degree of the risks involved that personnel needs to be aware of.
  - c. Stress safety for the personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. HW/HM management and environmental hazards.
  - f. Discuss some of specific guideline that pertains to FARE refueling mission.
    - (1) Night operations
    - (2) Orientation of site



**Performance Steps**

- (3) Approach of aircraft
  - (4) Hand and arm signals.
- (SAFETY: Do not be in front of an armed aircraft at any time)
- (5) Marshalling area
  - (6) Petroleum product quality surveillance
  - (7) Accountability procedures
4. Conduct Pre-Combat Checks and Pre-Combat Inspections.
    - a. Inspect personnel uniforms and equipment for serviceability and in conformity for mission, weather, or environment.
    - b. Verify that appropriate PPE is worn.
    - c. Check operators driver license, vehicle/equipment dispatch, and preventive maintenance checks and services (PMCS).
    - d. Check equipment inventory to ensure components parts or systems are complete.
    - e. Inspect petroleum quality surveillance equipment and filter effectiveness test. Ensure representative sample results are within specification and current in accordance with applicable reference materials and unit SOP.
    - f. Check availability of applicable reference materials (AR, FM, TM, and so on).
    - g. Inspect communication equipment and personnel knowledge on Communication Single Operating Instructions (CSOI).
  5. Maintain communications with lower and higher echelon and render reports as required.
  6. Identify training and cross-training for all personnel to include licensing for section's equipment.
  7. Project maintenance and repair requirements.
  8. Ensure the appropriate equipment for operation is on hand and mission capable.
  9. Select appropriate area to conduct aviation refueling operations, within scope of operations order. Conduct a reconnaissance by ground or air consider the following areas:
    - a. Select area with enough room to accommodate fueling mission. Request engineer support for obstacle removal and site improvement.
    - b. Determine wind direction and the type of aircraft to be refueled. Select area that provides approach, fueling, and take off with a head wind or cross wind.
    - c. Select operation on high grounds to prevent any fuel vapors from collecting around operation.
    - d. Select area that will provide natural concealment during operation.
    - e. Select area away from stream or river and power lines.
    - f. Designate holding areas for awaiting aircraft.
    - g. Designate passenger marshalling area.
    - h. Designate perimeter and fighting positions.
    - i. Sweep site for NBC contamination.
  10. Ensure system is setup and ready for aviation refueling operations in accordance with unit SOP and appropriate reference material.
    - a. Verify grounding rods, grounding connections, and bonding hook ups are serviceable and ready for operations.
    - b. Verify that fire extinguishers meet appropriate standards and are located at each refueling point, pump/ filter separator, and fuel drums.
    - c. Verify that sufficient water available to provide first aid measures, if required.
    - d. Verify that there are explosion-proof flashlights available for night operations.
    - e. Verify that NO SMOKING, DANGER, PASSENGER MARSHALLING AREA, EMERGRENCY SHUT OFF, RESTRICTED AREA, and ALARM signs have been posted.
    - f. Verify that marshalling area is designated and marked.
    - g. Verify that selected site is cleared of all loose debris that could cause damage to aircraft or injury to personnel.

**Performance Steps**

- h. Verify that system been pressure tested prior to operations.
  - i. Verify that perimeter has been established and fighting positions are prepared along with range cards.
11. Ensure preflight quality surveillance is performed.
    - a. Verify Aqua-Glo test results to ensure they are within standard and recorded prior to petroleum operations.
    - b. Verify that FARE system is flushed with at least five gallons of fuel through each point and sample is taken and recorded. Leave sample in drip pan at each point and at each Fuel drum so that any pilot can see the sample on request.
  12. Ensure PMCS are performed in accordance with vehicle/equipment technical manual (TM) and unit maintenance SOP.
  13. Inform chain of command when site is operational.
  14. Maintain communication with chain of command. Report status of operation and any problems encountered as required by unit SOP.
  15. Conduct dispensing operations in accordance with unit SOP and appropriate reference materials.
    - a. Establish communication with air traffic control and refueling aircraft. Designate landing pad for aircraft as they approach refueling operations.
    - b. Monitor personnel procedures during and after refueling operations.
    - c. Observe site for safety and environmental infractions. Shut down operations immediately if any infractions are detected.
    - d. Ensure all passengers on board aircraft but pilot leave air craft during refueling operations. Have passengers escorted to Marshalling area.
    - e. Ensure spills are cleaned up, reported as required by unit policies, procedures, and applicable environmental laws.
  16. Dispose of contaminated fuel and materials in an environmentally safe manner according to unit policies and procedures and applicable environmental laws.
  17. Verify that all equipment is inventoried, cleaned, stored and that all equipment that is non-mission capable (NMC) is replaced or fixed before equipment is stored.
  18. Verify that DA Form 3643 and DA Form 3644 is filled out correctly and turn in to supervisor.
  19. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensured personnel are knowledgeable on Concept of Operation.	—	—
4. Conducted pre-combat checks and pre-combat inspections.	—	—
5. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
6. Identified training and cross-training for all personnel to include licensing for section's equipment.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
7. Projected maintenance and repaired requirements.	—	—
8. Ensured the appropriate equipment for operation is on hand and serviceable.	—	—
9. Selected appropriate area to conduct aviation refueling operations.	—	—
10. Ensured system was setup and ready for aviation refueling operations in accordance with unit SOP and appropriate reference material.	—	—
11. Ensured that preflight quality surveillance was performed.	—	—
12. Ensured that PMCS was performed throughout refueling operations.	—	—
13. Informed the chain of command when the site was ready for refueling operations.	—	—
14. Maintained communication with the chain of command.	—	—
15. Conducted dispensing operations in accordance with unit SOP and appropriate reference materials.	—	—
16. Disposed of contaminated fuel and materials in an environmental safe manner according to unit policies and procedures and applicable environmental laws.	—	—
17. Verified that all equipment is inventoried, cleaned, and stored and that all equipment that is non-mission capable (NMC) is replaced or fixed before equipment is stored.	—	—
18. Verified that DA Form 3643 or DA Form 3644 is filled out correctly.	—	—
19. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**  
 DA FORM 3643  
 DA FORM 3644  
 FM 100-14  
 FM 10-67-1  
 FM 3-04.111

**Related**  
 AR 200-1  
 FM 3-100.12  
 FM 3-100.4  
 TM 10-4930-229-12&P  
 TM 10-8110-201-14&P  
 TM 5-4330-217-12  
 TM 5-6630-218-10

**Direct Fuel System Supply Point (FSSP) Operations****101-92F-3304**

**Conditions:** Given the requirement to store and issue bulk petroleum at a Class III supply point in a field environment. Personnel and materials required to perform task: eight per shift military occupational specialty (MOS)-qualified, a complete FSSP system, trucks to haul equipment, fuel source, fire extinguishers, communication equipment, spill kit/containment and cleanup equipment, Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP) (if required), the unit hazardous waste/hazardous material (HW/HM) management policy, an oral or written operations order (OPORD), risk management procedures, Material Safety Data Sheets (MSDS), personal protective equipment (PPE), unit standing operating procedure (SOP) on fuel support operations, DA Form 1296 (Stock Accounting Record), DA Form 2064 (Document Register for Supply Actions), DA Form 2765-1 (Request for Issue or Turn-in), DA Form 3643 (Daily Issues of Petroleum Products), DA Form 3644 (Monthly Abstract of Issues of Petroleum Products and Operating Supplies), DD Form 1348-1A (Issue Release/Receipt Document), DD Form 250 (Materiel Inspection and Receiving Report), and full access to all applicable reference materials.

**Standards:** Direct movement, placement, and assembly of FSSP system, ensuring site is suitable for refueling operations, fuel accountability, and quality surveillance are performed without injury to personnel, damage to equipment, or pollution of the environment.

**Performance Steps****DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Implement environmental stewardship measures according to critical task 101-92F-3312.
3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operations in accordance with OPORD, unit SOP, and specific guidelines that pertain to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. HW/HM management and environmental hazards.
  - f. Discuss specific guideline that pertains to Fuel System Supply Point.
    - (1) Orientation of site.
    - (2) Continuous quality surveillance of all petroleum products.
    - (3) Accountability and reporting procedures.
    - (4) Preventive maintenance checks and services (PMCS).

## Performance Steps

4. Conduct Pre-Combat Checks and Pre-Combat Inspections.
  - a. Inspect personnel uniforms and equipment for serviceability and in conformity to the mission, weather, or environment.
  - b. Check appropriate PPE is on hand.
  - c. Check operator's licenses, vehicle dispatch, and PMCS.
  - d. Verify that vehicle is topped off with fuel.
  - e. Check equipment inventory to ensure components parts or systems are complete.
  - f. Inspect basic issue items (BII), fire extinguisher, warning triangles, first aid kit, jack, and lug wrench.
  - g. Ensure each vehicle has food and water for each Soldier.
  - h. Check required reference materials (AR, FM, TM, SOP, and so on).
  - i. Check filter effectiveness results. Ensure representative sample results are within specification and current in accordance with unit SOP and applicable reference materials.
  - j. Check communications equipment and personnel knowledge on communication procedures and operating instructions.
5. Maintain communications with lower and higher echelon and render reports as required.
6. Identify training and cross-training for all personnel to include licensing for section's equipment.
7. Project maintenance and repair requirements.
8. Prepare movement of FSSP.
  - a. Conduct reconnaissance of pre-selected site and review layout plan with supervisor.
  - b. Draw site sketch to include layout of components, traffic flow pattern and special areas of interest.
  - c. Request engineer support, if necessary, to construct fire walls for tanks.
  - d. Determine quantity and fuel type needed to be moved to new site.
  - e. Determine number of personnel and FSSP equipment to be transported to a new site.
  - f. Implement a load plan for all vehicles.
9. Direct movement of FSSP.
  - a. Prepare FSSP for move as required by situation (whole system versus leap frog). Ensure FSSP is properly evacuated and disassembled.
  - b. Maintain communications with the chain of command. Render the status reports as required by unit policies and procedures and forward them to the supervisor.
  - c. Ensure any spills are cleaned up and reported as required by unit policies and procedures and applicable environmental laws. Dispose of contaminated fuel and materials in an environmentally safe manner according to unit policies and procedures and applicable environmental laws.
10. Direct layout of FSSP.
  - a. Brief personnel on the positioning of major components of the FSSP.
  - b. Ensure signs such as NO SMOKING, FLOW OF TRAFFIC, VEHICLE SPEED, CUSTOMER PARKING, and LOW AREAS are in place where fuel vapors may collect.
  - c. Set up checkpoint at the entrance and one at the exits of the operating area.
  - d. Develop a fire plan.
  - e. Develop a security plan.
11. Direct FSSP operations.
  - a. Prepare work schedule for FSSP personnel.
  - b. Prepare schedules for receiving and issuing fuel.
  - c. Ensure quality surveillance is conducted on product prior to receiving fuels and routine periodic sampling of petroleum products.
  - d. Requisition fuel as required.
  - e. Account for receipt and issue of petroleum in the supply point.

**Performance Steps**

NOTE: There are many documents used for accounting for receipt, issue, and stocks on hand within a Class III. Petroleum accounting records include: DD Form 1348-1A, DA Form 2765-1, DA Form 3643, DA Form 3644, DA Form 2064, and DA Form 1296. Illustrations and procedures for completing forms can be found in AR 710-2-1.

12. Observe operations for safety and environmental violations. Take appropriate action(s) immediately if violations occur to correct problem.
13. Ensure maintenance of equipment is conducted according to technical manuals (TMs).
14. Prepare daily status reports of petroleum products and personnel. Forward a copy of reports to supervisor.
15. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensured personnel were knowledgeable on Concept of Operations in accordance with OPORD, unit SOP, and specific guidelines that pertained to task or mission.	—	—
4. Conducted Pre-Combat Checks and Pre-Combat Inspections.	—	—
5. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
6. Identified training and cross-training for all personnel to include licensing for section's equipment.	—	—
7. Projected maintenance and repaired requirements.	—	—
8. Prepared movement of the Fuel Systems Supply Point (FSSP).	—	—
9. Supervised the movement of the FSSP.	—	—
10. Directed the layout of the FSSP.	—	—
11. Directed FSSP operations.	—	—
12. Observed operations for safety and environmental violations. Took appropriate action if violations occurred to correct the problem.	—	—
13. Ensured maintenance of equipment was conducted according to technical manual (TMs).	—	—
14. Prepared daily status reports of petroleum products and personnel. Forwarded reports to supervisor.	—	—
15. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier scores NO-GO, show the Soldier what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 1296  
DA FORM 2064  
DA FORM 2765-1  
DA FORM 3643  
DA FORM 3644  
DD FORM 1348-1A  
DD FORM 250  
FM 10-67-1  
FM 3-100.12  
FM 3-100.4

**Related**

DA PAM 710-2-1  
DA PAM 750-8  
FM 10-426  
TM 10-4930-232-12&P

**Direct Petroleum Assault Hoseline Operations****101-92F-3315**

**Conditions:** Given the requirement to direct fueling operations in a field environment. Personnel and materials required to perform task: thirteen military occupational specialty (MOS)-qualified (92F) Soldiers; spill kit/containment and clean up equipment, complete hose line system (which consists of 13,000 feet of 4-inch collapsible hose packed in flaking boxes (one each Tri-con container), 350-gallons per minute (GPM) pumping assembly, flow control kit, roadway crossing guard, hose line suspension kit, hose line assembly, hose line packing kit, and repair kit. Fire extinguishers, trucks, evacuation kit, air compressor (250 cubic feet per minute [CFM]), forklift 10,000-pounds, communication equipment, risk management procedures, applicable Material Safety Data Sheets (MSDS), Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required), personal protective equipment (PPE), unit standing operating procedure (SOP), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)), DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)), DA Form 3643 (Daily Issues of Petroleum Products), and full access to all applicable reference materials.

**Standards:** Direct the layout, assembly, operator's preventive maintenance checks and services (PMCS), operation, and disassembly of the Assault Hoseline System (AHS) without damage to equipment, injury to personnel, or pollution of environment. Maintain all applicable reference materials, records, fuel accountability, and communication equipment.

**Performance Steps****DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Implement environmental stewardship measures according to critical task 101-92F-3312.
3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with operations order (OPORD), unit SOP, and specific guidelines that pertain to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish the mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous waste/hazardous material (HW/HM) management and environmental hazards.
  - f. Discuss specific guideline that pertains to Assault Hoseline Operations.
4. Conduct Pre-combat Checks and Pre-combat Inspections.



**Performance Steps**

5. Maintain communications with lower and higher echelon and render reports as required.
6. Identify training and cross-training for all personnel to include licensing for section's equipment.
7. Project maintenance and repair requirements.
8. Ensure six soldiers and appropriate equipment are on hand to accomplish the tasks in accordance with appropriate reference material, unit SOP, and environmental requirement.
9. Ensure direct route for the hoseline is selected in accordance with map/site recon report, scope of the operations order, and company/battalion SOP.
10. Ensure the hoseline is laid out, assembled, and operated in accordance with appropriate TM's and FM's.
11. Inform chain of command the operational status of systems and render reports to supervisor as required by unit SOP and/or higher HQ.
12. Observe operations for safety and environmental infraction. Take appropriate immediate action(s) to correct any problems.
13. Ensure the hose line is evacuated, disassembled, and moved in accordance with applicable reference materials (TM, FM, SOP, OPORD).
14. Maintain accountability records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensure personnel are knowledgeable on Concept of Operations.	—	—
4. Entered communications nets and conducted communications checks in accordance with company/battalion SOP and current communications instructions.	—	—
5. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
6. Identified training and cross-training for all personnel to include licensing for section's equipment.	—	—
7. Projected maintenance and repair requirements.	—	—
8. Ensured six soldiers and appropriate equipment are on hand to accomplish tasks in accordance with appropriate reference materials, SOP and environmental requirements.	—	—
9. Ensured direct route for the hoseline is selected in accordance with map/site recon, scope of the operations order (OPORD) and company/battalion SOP.	—	—
10. Ensured the hoseline is laid out, assembled, and operated in accordance with appropriate reference materials.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
11. Informed chain of command the operational status of systems and render reports to supervisor as required by unit SOP and/or higher HQ.	—	—
12. Observed operations for safety and environmental infractions. Took appropriate immediate action(s) to resolved problems.	—	—
13. Ensured assault hoseline is evacuated, disassembled, and retrieved.	—	—
14. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
 DA FORM 5987-E  
 DA FORM 5988-E  
 DD FORM 1970  
 FM 10-67-1

**Related**

FM 100-14  
 FM 3-100.12  
 FM 3-100.4  
 FM 5-482  
 TM 10-4320-343-14  
 TM 5-4310-452-14

## Direct Advanced Aviation Forward Area Refueling System (AAFARS) Operations

### 101-92F-3501

**Conditions:** Given the requirement to provide aviation refueling support on a fixed airstrip or pre-designated field location. Personnel and materials required to perform the task: five military occupational specialty (MOS)-qualified (92F) Soldiers and one MOS 93H or pathfinder personnel that have required Air Traffic Control (ATC) skills; customer (aircraft with crew), proper on-specifications product, appropriate communication system, AAFARS system, risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protection equipment (PPE), spill kit/containers, Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required), the unit hazardous waste/hazardous material (HW/HM) management policy, an oral or written operations order (OPORD), unit standing operating procedure (SOP) on aviation refueling operations, DA Form 3643 (Daily Issues of Petroleum Products), DA Form 3644 (Monthly Abstract of Issues of Petroleum Products and Operating Supplies), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)), and full access to all reference materials.

**Standards:** Direct the assembly, operation, operator's preventive maintenance checks and services (PMCS), and disassembly of the AAFARS, ensuring site is suitable for refueling operations, fuel accountability, and quality surveillance are performing without injury to personnel, damage to equipment, or pollution of the environment.

### Performance Steps

1. Apply risk management procedures.
    - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
    - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
    - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
  2. Implement environmental stewardship measures according to critical task 101-92F-3312.
  3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with OPORD, unit SOP, and specific guidelines that pertains to task or mission.
    - a. Ensure personnel understand mission or task at hand.
      - (1) Individual tasks or specific role of every personnel to accomplish the mission.
      - (2) Collective tasks that a group needs to perform to support mission.
    - b. Explain degree of risks involved that personnel needs to be aware of.
    - c. Stress safety for personnel to incorporate throughout operations.
    - d. Spill prevention and control measures.
    - e. HW/HM management and environmental hazards.
    - f. Discuss specific guideline that pertains to the AAFARS.
      - (1) Night operations.
      - (2) Orientation of sight.
      - (3) Approach of aircraft.
      - (4) Hand and Arm signals
- (SAFETY: Do not be in front of armed aircraft at any time).
- (5) Marshalling area.
  - (6) Quality surveillance.
  - (7) Accountability procedures.

## Performance Steps

4. Conduct Pre-Combat Checks and Pre-Combat Inspections.
  - a. Inspect personnel uniforms and equipment for serviceability and in conformity to mission, weather, or environment.
  - b. Check the appropriate PPE is on hand.
  - c. Check operator license, dispatch, and PMCS records.
  - d. All equipment is mission capable.
  - e. Check load plans and ensure that all equipment is packed to complete mission.
  - f. Check that all TM's and FM's required are available.
  - g. Check that paper work for filter effectiveness is current and within standards.
5. Maintain communications with lower and higher echelon and render reports as required.
6. Identify training and cross-training for all personnel to include licensing for section's equipment.
7. Project maintenance and repair requirements.
8. Select appropriate area to conduct aviation refueling operations, within the scope of the operations order. Conduct a reconnaissance by ground or air consider the following areas:
  - a. Select area with enough room to accommodate fueling mission. Request engineer support for obstacle removal and site improvement.
  - b. Determine wind direction and the type of aircraft to be refueled. Select area that provides approach, fueling, and take off with a head wind or cross wind.
  - c. Select operation on high grounds to prevent any fuel vapors from collecting around operation.
  - d. Select area that will provide natural concealment during operation.
  - e. Select area away from stream or river.
  - f. Designate holding areas for awaiting aircraft.
  - g. Designate passenger marshalling area.
  - h. Designate the perimeter and fighting positions.
  - i. sweep the site for NBC contamination
9. Ensure the system is setup and ready for aviation refueling operations in accordance with unit SOP and appropriate FM/TMs.
  - a. Verify grounding rods, grounding connections, and bonding hook ups are serviceable and ready for operations.
  - b. Verify that the fire extinguishers meet appropriate standards and are located at each refueling point, pump/filter separator and fuel drums.
  - c. Verify that sufficient water available to provide first aid measures, if required.
  - d. Verify that there are explosion-proof flashlights available for night operations.
  - e. Verify that NO SMOKING, DANGER, PASSENGER MARSHALLING AREA, EMERGENCY SHUT OFF, RESTRICTED AREA, and ALARM signs have been posted.
  - f. Verify that marshalling area is designated and marked.
  - g. Verify that selected site is cleared of all loose debris that could cause damage to aircraft or injury to personnel.
  - h. Verify that the system been pressure tested prior to operations.
  - i. Verify that the perimeter has been established and fighting positions are prepared along with range cards.
10. Ensure preflight quality surveillance is performed.
  - a. Verify the recirculation of the fuel and the Aqua-Glo test results from test pad are completed and recorded prior to servicing aircraft.
  - b. Verify that AAFARES system is flushed with at least five gallons of fuel through each point and sample is taken and recorded. Leave sample in drip pan at each point and at each Fuel drum so that any pilot can see sample on request.
11. Ensure PMCS is performed in accordance with task 101-92F-3302.
12. Inform the chain of command when the site is operational.

**Performance Steps**

13. Maintain communication with the chain of command. Report status of operation and any problems encountered as required by unit SOP.
14. Conduct dispensing operations in accordance with unit SOP and appropriate FM/TMs.
  - a. Establish communication with air traffic control and refueling aircraft. Designate landing pad for aircraft as they approach refueling operations.
  - b. Monitor personnel procedures during and after refueling operations.
  - c. Observe site for safety and environmental infractions. Shut down operations immediately if any infractions are detected.
  - d. Ensure all passengers on board aircraft but the pilot leave air craft during re fueling operations. Have passengers escorted to Marshalling area.
  - e. Ensure spills are cleaned up, reported as required by unit policies, procedures, and applicable environmental laws.
15. Ensure accountability of fuel using DA Form 3643. Post summarized information from DA Form 3643 to DA Form 3644 to show total monthly issues and receipts. Forward to responsible centralized stock accounting section for accounting record adjustment.
16. Dispose of contaminated fuel and materials in an environmentally safe manner according to unit policies and procedures and applicable environmental laws.
17. Verify that all equipment is inventoried, cleaned, and stored and that all equipment that is non-mission capable (NMC) is replaced or fixed before equipment is stored.
18. Ensured accountability of fuel using DA Form 3643. Post summarized information from DA Form 3643 to DA Form 3644 to show total monthly issues and receipts. Forward to responsible centralized stock accounting section for accounting record adjustment.
19. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensured personnel were knowledgeable on Concept of Operation in accordance with OPORD, unit SOP, and specific guidelines that pertained to task or mission.	—	—
4. Conducted Pre-Combat Checks and Pre-Combat Inspections.	—	—
5. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
6. Identified training and cross-training for all personnel to include licensing for section's equipment.	—	—
7. Projected maintenance and repair requirements.	—	—
8. Selected appropriate area to conduct aviation refueling operations, within the scope of the operations order. Conducted a reconnaissance by ground or air.	—	—
9. Ensured the system was setup and ready for aviation refueling operations in accordance with unit SOP and appropriate FM/TMs.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
10. Ensured preflight quality surveillance was performed.	—	—
11. Ensured PMCS was performed in accordance with task 101-92F-3302.	—	—
12. Informed the chain of command when the site was operational.	—	—
13. Maintained communication with the chain of command. Reported status of operation and any problems encountered as required by unit SOP.	—	—
14. Conducted dispensing operations in accordance with unit SOP and appropriate FM/TMs.	—	—
15. Ensured accountability of fuel using DA Form 3643. Posted summarized information from DA Form 3643 to DA Form 3644 to show total monthly issues and receipts. Forwarded to responsible centralized stock accounting section for accounting record adjustment.	—	—
16. Disposed of contaminated fuel and materials in an environmentally safe manner according to unit policies and procedures and applicable environmental laws.	—	—
17. Verified that all equipment is inventoried, cleaned, and stored and that all equipment that is non-mission capable (NMC) is replaced or fixed before equipment is stored.	—	—
18. Verified that accountability of product is being maintained on DA Form 3643.	—	—
19. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 2404
- DA FORM 3643
- DA FORM 3644
- DA FORM 5988-E
- FM 10-67-1
- FM 3-04.111
- TM 10-4330-237-13&P
- TM 10-4930-250-13&P
- TM 10-4930-351-14

**Related**

- FM 3-100.12
- FM 3-100.4
- TM 10-8110-201-14&P

## Direct Remote Refueling, Rearming, Deployable Distribution System (R3D2S) Operations

### 101-92F-3502

**Conditions:** Given the requirement to provide aviation refueling support on a fixed airstrip or pre-designated field location. Personnel and materials required to perform the task: five military occupational specialty (MOS)-qualified (92F) Soldiers and one MOS 93H or pathfinder personnel that have required Air Traffic Control (ATC) skills; aircraft (UH-60) and customer aircraft, appropriate communication system, R3D2S system, risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protection equipment (PPE), spill kit/containers, Facility Response Plan (FRP); Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required), the unit hazardous waste/hazardous material (HW/HM) management policy, an oral or written operations order (OPORD), unit standing operating procedure (SOP) on aviation refueling operations, DA Form 3643 (Daily Issues of Petroleum Products), DA Form 3644 (Monthly Abstract of Issues of Petroleum Products and Operating Supplies), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)), DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)), and full access to all reference materials.

**Standards:** Direct placement, assembly, operation, operator's preventive maintenance checks and services (PMCS), and disassembly of the R3D2S, ensuring site is suitable for refueling operations, fuel accountability, and quality surveillance are performed without injury to personnel, damage to equipment, or pollution of the environment.

### Performance Steps

1. Apply risk management procedures.
    - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
    - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
    - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
  2. Implement environmental stewardship measures according to critical task 101-92F-3312.
  3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with OPORD, unit SOP, and specific guidelines that pertain to task or mission.
    - a. Ensure personnel understand mission or task at hand.
      - (1) Individual tasks or specific role of every personnel to accomplish the mission.
      - (2) Collective tasks that a group needs to perform to support mission.
    - b. Explain degree of risks involved that personnel needs to be aware of.
    - c. Stress safety for personnel to incorporate throughout operations.
    - d. Spill prevention and control measures.
    - e. HW/HM management and environmental hazards.
    - f. Discuss specific guideline that pertains to Remote Refueling, Rearming, Deployable Distribution System.
      - (1) Night operations
      - (2) Orientation of site
      - (3) Approach of aircraft
      - (4) Hand and Arm signals
- (SAFETY: Do not be in front of armed aircraft at any time).
- (5) Marshalling area
  - (6) Quality surveillance
  - (7) Accountability procedures

## Performance Steps

4. Conduct Pre-Combat Checks and Pre-Combat Inspections.
  - a. Inspect personnel uniforms and equipment for serviceability and in conformity to mission, weather, or environment.
  - b. Check the appropriate PPE is on hand.
  - c. Check operator license, dispatch, and PMCS records.
  - d. Inspect equipment to ensure it is mission capable.
  - e. Check load plans and ensure that all equipment is packed to complete mission.
  - f. Check that all reference materials and forms required are available.
  - g. Check that paper work for filter effectiveness is current and with in standards.
  - h. Inspect communication equipment and personnel knowledge on communication procedures and operating instructions.
5. Maintain communications with lower and higher echelon and render reports as required.
6. Identify training and cross-training for all personnel to include licensing for section's equipment.
7. Project maintenance and repair requirements.
8. Ensure appropriate equipment for operation is on hand and serviceable.
9. Select appropriate area to conduct aviation refueling operations, within the scope of the operations order. Conduct a reconnaissance by ground or air consider the following areas:
  - a. Select area with enough room to accommodate fueling mission. Request engineer support for obstacle removal and site improvement.
  - b. Determine wind direction and the type of aircraft to be refueled. Select area that provides approach, fueling, and take off with a head wind or cross wind.
  - c. Select operation on high grounds to prevent any fuel vapors from collecting around operation.
  - d. Select area that will provide natural concealment during operation.
  - e. Select area away from stream or river.
  - f. Designate holding areas for awaiting aircraft.
  - g. Designate passenger marshalling area.
  - h. Designate the perimeter and fighting positions.
  - i. sweep the site for NBC contamination.
10. Ensure the system is setup and ready for aviation refueling operations in accordance with unit SOP and appropriate FM/TMs.
  - a. Verify grounding rods, grounding connections, and bonding hook ups are serviceable and ready for operations.
  - b. Verify that the fire extinguishers meet appropriate standards and are located at each refueling point and at R3D2S.
  - c. Verify that sufficient water available to provide first aid measures, if required.
  - d. Verify that there are explosion-proof flashlights available for night operations.
  - e. Verify that NO SMOKING, DANGER, PASSENGER MARSHALLING AREA, EMERGRENCY SHUT OFF, RESTRICTED AREA, and ALARM signs have been posted.
  - f. Verify that marshalling area is designated and marked.
  - g. Verify that selected site is cleared of all loose derbies that could cause damage to aircraft or injury to personnel.
  - h. Verify that system been pressure tested prior to operations.
  - i. Verify that perimeter has been established and fighting positions are prepared along with range cards.



**Performance Steps**

11. Ensure preflight quality surveillance is performed.
  - a. Verify recirculation of fuel and Aqua-Glo test results from test pad are completed and recorded prior to servicing aircraft.
  - b. Verify that R3D2S system is flushed with at least five gallons of fuel through each point and sample is taken and recorded. Leave sample in drip pan at each point and at the R3D2S so that any pilot can see the sample on request.
12. Ensure PMCS is performed.
13. Inform the chain of command when the site is operational.
14. Maintain communication with the chain of command. Report status of operation and any problems encountered as required by unit SOP.
15. Conduct dispensing operations in accordance with unit SOP and appropriate FM/TMs.
  - a. Establish communication with air traffic control and refueling aircraft. Designate landing pad for aircraft as they approach refueling operations.
  - b. Monitor personnel procedures during and after refueling operations.
  - c. Observe site for safety and environmental infractions. Shut down operations immediately if any infractions are detected.
  - d. Ensure all passengers on board aircraft but the pilot leave air craft during re fueling operations. Have passengers escorted to Marshalling area.
  - e. Ensure spills are cleaned up, reported as required by unit policies, procedures, and applicable environmental laws.
16. Dispose of contaminated fuel and materials in an environmentally safe manner according to unit policies and procedures and applicable environmental laws.
17. Verify that all equipment is inventoried, cleaned, and stored and that all equipment that is non-mission capable (NMC) is replaced or fixed before equipment is stored.
18. Ensure accountability of fuel using DA Form 3643. Post summarized information from DA Form 3643 to DA Form 3644 to show total monthly issues and receipts. Forward to responsible centralized stock accounting section for accounting record adjustment.
19. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensured personnel are knowledgeable on Concept of Operations.	—	—
4. Conducted Pre-Combat Checks and Pre-Combat Inspections	—	—
5. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
6. Identified training and cross-training for all personnel to include licensing for section's equipment.	—	—
7. Projected maintenance and repaired requirements.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
8. Ensured appropriate equipment for operation is on hand and serviceable.	—	—
9. Selected appropriate area to conduct aviation refueling operations.	—	—
10. Ensured that system was setup and ready for aviation refueling operations in accordance with unit SOP and appropriate FM/TMs.	—	—
11. Ensured that preflight quality surveillance was performed.	—	—
12. Ensured that PMCS was performed throughout refueling operations.	—	—
13. Informed chain of command when site was ready for refueling operations.	—	—
14. Maintained communication with chain of command.	—	—
15. Conducted dispensing operations in accordance with unit SOP and appropriate FM/TMs.	—	—
16. Disposed of contaminated fuel and materials in an environmental safe manner according to unit policies and procedures and applicable environmental laws.	—	—
17. Verified that all equipment is inventoried, cleaned, and stored and that all equipment that is non-mission capable (NMC) is replaced or fixed before equipment is stored.	—	—
18. Ensured accountability of fuel using DA Form 3643. Post summarized information from DA Form 3643 to DA Form 3644 to show total monthly issues and receipts. Forward to responsible centralized stock accounting section for accounting record adjustment.	—	—
19. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

<b>Required</b>	<b>Related</b>
DA FORM 2404	
DA FORM 3643	
DA FORM 3644	
DA FORM 5987-E	
DA FORM 5988-E	
DD FORM 1970	
FM 10-67-1	
FM 3-04.111	
FM 3-100.12	
FM 3-100.4	
TM 5-4930-237-10	

## Direct Load Handling System Modular Fuel Farm (LMFF) Operations

### 101-92F-3503

**Conditions:** Given the requirement to direct fueling operations in a field environment. Personnel and materials required to perform task: five military occupational specialty (MOS)-qualified (92F) Soldiers; Load Handling System Modular Fuel Farm (LMFF), Load Handling System (LHS) or Palletized Load System (PLS) trucks to haul/download equipment and personnel, risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE), communication equipment, written or oral operations order (OPORD), fuel source, fire extinguishers, spill kit/containment and clean up equipment, Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP) (if required), unit standing operating procedure (SOP) on petroleum operations, DA Form 3643 (Daily Issues of Petroleum Products), DA Form 3644 (Monthly Abstract of Issues of Petroleum Products and Operating Supplies), and full access to all applicable forms and reference materials.

**Standards:** Direct the assembly, operation, operator's preventive maintenance checks and services (PMCS), and disassembly of the LMFF, without damage to equipment, injury to personnel, or pollution of environment. Maintain communication and appropriate reports/forms.

#### Performance Steps

NOTE: In this task, as in many task involving extensive handling petroleum products, make sure the proper equipment is on hand to contain and clean up any spills. Supervise the unpacking, inspecting, and positioning of the equipment before task begins. Briefed Soldiers on the task and ensure they understand the task at hand.

1. Apply risk management procedures.
2. Implement environmental stewardship measures according to critical task 101-92F-3312.
3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with OPORD, unit SOP, and specific guidelines that pertain to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish the mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous waste/hazardous material (HW/HM) management and environmental hazards.
  - f. Discuss specific guideline that pertains to the LMFF System.
    - (1) Orientation of site
    - (2) Quality surveillance
    - (3) Accountability procedures
4. Conduct Pre-Combat Checks and Pre-Combat Inspections.
  - a. Inspect personnel uniforms and equipment for serviceability and in conformity to mission, weather, or environment.
  - b. Check that appropriate PPE is on hand.
  - c. Check operator license, dispatch, and PMCS records.
  - d. Inspect communication equipment and personnel knowledge on communication procedures and operating instructions.
  - e. Check applicable reference materials and forms.
5. Maintain communications with lower and higher echelon and render reports as required.
6. Identify training and cross-training for all personnel to include licensing for section's equipment.

**Performance Steps**

7. Project maintenance and repair requirements.
8. Conduct site recon and determine the emplacement of LMFF System in accordance with oral or written order, unit SOP, appropriate TM's and FM's.
9. Direct assembling of LMFF.
10. Verify operation procedures in accordance with appropriate TM's and FM's.
11. Verify that fuel was visually checked for color and clarity and contamination.
  - a. Visual examination.
  - b. API gravity test.
12. Verify that all safety violations and environmental compliance is being followed. Take appropriate actions if any safety or environmental infraction occurs.
13. Verify before-, during-, and after-operations PMCS are completed and annotated on appropriate forms.
14. Direct disassembling of LMFF.
15. Verify inspection of site for fuel spills.
16. Coordinate and verify the clean up of all spills and disposal of all waste material.
17. Ensure accountability of fuel using DA Form 3643. Post summarized information from DA Form 3643 to DA Form 3644 to show total monthly issues and receipts. Forward to responsible centralized stock accounting section for accounting record adjustment.
18. Consolidate and submit reports that are required by higher headquarters and other agency in accordance with unit SOP and appropriate reference materials.
19. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensure personnel are knowledgeable on Concept of Operations.	—	—
4. Conducted Pre-Combat Checks and Pre-Combat Inspections.	—	—
5. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
6. Identified training and cross-training for all personnel to include licensing for section's equipment.	—	—
7. Projected maintenance and repaired requirements.	—	—
8. Conducted site recon and determined emplacement of LMFF in accordance with OPORD, unit SOP, and appropriate TMs and FMs.	—	—
9. Directed assembling of LMFF.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
10. Verified operation procedures in accordance with appropriate TMs and FMs.	—	—
11. Verified that fuel was visually checked for color and clarity and contamination.	—	—
12. Verified that all safety violations and environmental compliance is being followed.	—	—
13. Verified before-, during-, and after-operations PMCS are completed and annotated on appropriate form.	—	—
14. Directed disassembling of LMFF.	—	—
15. Verified inspection of site for fuel spills.	—	—
16. Coordinated and verified clean up of all spills and disposal of all waste material.	—	—
17. Ensured accountability of fuel using DA Form 3643. Posted summarized information from DA Form 3643 to DA Form 3644 to show total monthly issues and receipts. Forwarded to responsible centralized stock accounting section for accounting record adjustment.	—	—
18. Consolidated and submitted reports that are required by higher headquarters or agency in accordance with unit SOP and appropriate reference materials.	—	—
19. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 3643
- DA FORM 3644
- FM 10-67-1
- FM 3-100.12
- FM 3-100.4
- TM 10-4930-247-13&P

**Related**

- AR 200-1
- DA PAM 750-8
- TM 5-4930-237-10

## Direct Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem Operations

### 101-92F-3504

**Conditions:** Given the requirement to direct fueling operations in a field environment. Personnel and materials required to perform task: six military occupational specialty (MOS)-qualified (92F) Soldiers; Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem, one 5-ton forklift with operator, risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE) such as hearing and eye protection, gloves, and clothing, fire extinguishers, spill kits/containment and clean up equipment, an oral or written operations order (OPORD), Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP) (if required), unit standing operating procedure (SOP) on petroleum operations, DA Form 3643 (Daily Issues of Petroleum Products), DA Form 3644 (Monthly Abstract of Issues of Petroleum Products and Operating Supplies), and full access to all reference materials.

**Standards:** Direct the set up, operator's preventive maintenance checks and services (PMCS), operation, fuel accountability and quality surveillance, and dismantling of the Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem without injury to personnel, damage to equipment, or of the environment.

#### Performance Steps

1. Apply risk management procedures.
2. Implement environmental stewardship measures according to critical task 101-92F-3312.
3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with OPORD, unit SOP, and specific guidelines that pertain to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish the mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous waste/hazardous material (HW/HM) management and environmental hazards.
  - f. Discuss specific guideline that pertains to Force Provider Bulk Fuel Storage and Distribution Subsystem.
4. Conduct Pre-Combat Checks and Pre-Combat Inspections.
  - a. Inspect personnel uniforms and equipment for serviceability and in conformity to mission, weather, or environment.
  - b. Check that PPE is on hand.
  - c. Check operator license, dispatch, and PMCS records.
  - d. Check applicable reference materials and forms.
  - e. Inspect communication equipment and personnel knowledge on communication procedures and operating instructions.
5. Maintain communications with lower and higher echelon and render reports as required.
6. Identify training and cross-training for all personnel to include licensing for section's equipment.
7. Project maintenance and repair requirements.
8. Reconnoiter assigned area of operations and determine site where system will be placed.
9. Verify system is safely down loaded with forklift.
10. Verify before-, during-, and after-operations PMCS performed on systems.

**Performance Steps**

11. Direct set up of the Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem.
12. Monitor operation of Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem.
13. Verify that quality surveillance and safety programs are being maintained in accordance with unit SOP and appropriate reference materials.
14. Verify correct procedures and forms are being used for fuel accountability and recording.
15. Direct dismantling of Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem.
16. Ensured accountability of fuel using DA Form 3643. Post summarized information from DA Form 3643 to DA Form 3644 to show total monthly issues and receipts. Forward to responsible centralized stock accounting section for accounting record adjustment.
17. Maintain and forward a copy of completed fuel accountability records and reports to Class III Platoon Sergeant.
18. Direct and monitor cleaning and securing of equipment.
19. Coordinate disposal of hazardous and contaminated fuel (if there is any) in accordance with applicable reference materials.
20. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensured personnel are knowledgeable on Concept of Operations.	—	—
4. Conducted Pre-Combat Checks and Pre-Combat Inspections.	—	—
5. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
6. Identified training and cross-training for all personnel to include licensing for section's equipment.	—	—
7. Projected maintenance and repaired requirements.	—	—
8. Reconnoitered assigned area of operations and determined the site where the system will be placed.	—	—
9. Verified system was safely down loaded with the forklift.	—	—
10. Verified before-, during-, and after-operations PMCS performed on systems.	—	—
11. Directed setup of Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem.	—	—
12. Monitored operation of Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
13. Verified that quality surveillance and safety programs are being maintained in accordance with unit SOP and appropriate reference materials.	—	—
14. Verified correct procedures and forms are being used for fuel accountability and recording.	—	—
15. Directed dismantling of Force Provider (FP) Bulk Fuel Storage and Distribution Subsystem.	—	—
16. Ensured accountability of fuel using DA Form 3643. Posted summarized information from DA Form 3643 to DA Form 3644 to show total monthly issues and receipts. Forwarded to responsible centralized stock accounting section for accounting record adjustment.	—	—
17. Maintained and forwarded a copy of completed fuel accountability records and reports to Class III Platoon Sergeant.	—	—
18. Directed and monitored cleaning and securing of equipment.	—	—
19. Coordinated disposal of hazardous materials and contaminated fuel (if there is any) in accordance with applicable reference materials.	—	—
20. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 3643
- DA FORM 3644
- FM 10-67-1
- FM 3-100.12
- FM 3-100.4

**Related**



## Subject Area 12: DIRECTING PIPELINE OPERATIONS

**Direct Petroleum Pipeline Pump Station Operations****101-92F-3201**

**Conditions:** Given the requirement to maintain pipeline pumping operations on a 24-hour basis on an Inland Petroleum Distribution System (IPDS) in a field environment. Personnel and materials required to perform task: eight military occupational specialty (MOS)-qualified (92F) Soldiers; daily pumping order, a pump station, a manifold system, personal protective equipment (PPE), Material Safety Data Sheets (MSDS), risk management procedures, communication equipment, Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP) (if required), unit standing operating procedure (SOP) on petroleum operations, and full access to all reference material.

**Standards:** Direct petroleum pipeline pump station operations, without damaging equipment, commingling products, injuring personnel, or polluting the environment.

**Performance Steps****DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Implement environmental stewardship measures according to critical task 101-92F-3312.
3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with operations order (OPORD), unit SOP, and specific guideline that pertain to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous waste/hazardous material (HW/HM) management and environmental hazards.
  - f. Discuss specific guideline that pertains to Petroleum Pipeline Pump Station Operations.
    - (1) Receiving and issuing product in pipeline/Tactical Petroleum Terminal (TPT). Specifically procedures for handling product interface.
    - (2) Reporting procedures.
    - (3) Communication procedures.
4. Conduct Pre-Combat Checks and Pre-Combat Inspections.
  - a. Inspect personnel uniform and equipment for serviceability and in conformity to mission, weather, or environment.

**Performance Steps**

- b. Check that appropriate PPE is on hand.
  - c. Check operators license, vehicle/equipment dispatch, and PMCS.
  - d. Check equipment inventory to ensure component parts or systems are complete.
  - e. Check required reference materials (AR, FM, TM, SOP, and so on).
  - f. Check communication equipment and personnel knowledge on current Communication Single Operating Instructions (CSOI).
5. Maintain communications with lower and higher echelon and render reports as required.
  6. Identify training and cross-training for all personnel to include licensing for section's equipment.
  7. Project maintenance and repair requirements.
  8. Ensure personnel are knowledgeable on current operations and establish training if needed.
  9. Coordinate with product control section for daily pumping order, 24 hours in advance of operations.
  10. Establish work schedules and assign duties.
  11. Issue daily pumping orders to subordinates.
  12. Schedule line sampling and testing during pumping operations.
  13. Establish pipeline patrol force.
  14. Project maintenance and repair requirements.
  15. Conduct fire drills.
  16. Employ quality surveillance measures during pumping operations.
  17. Observe operations for any safety or environmental infractions and stop operations immediately if any violations are found and correct them.
  18. Maintain communications with chain of command and render status reports as required by unit policy.
  19. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with operations order (OPORD), unit SOP, and specific guideline that pertain to task or mission.	—	—
4. Conducted Pre-Combat Checks and Pre-Combat Inspections.	—	—
5. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
6. Identified training and cross-training for all personnel to include licensing for section's equipment.	—	—
7. Projected maintenance and repaired requirements.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
8. Ensured personnel were knowledgeable on current operations and established training as needed.	—	—
9. Coordinated with product control section for daily pumping order, 24 hours in advance of operations.	—	—
10. Established work schedules and assigns duties.	—	—
11. Issued daily pumping orders to subordinates.	—	—
12. Scheduled line sampling and testing during pumping operations.	—	—
13. Established pipeline patrol force.	—	—
14. Projected maintenance and repair requirements.	—	—
15. Conducted fire drills.	—	—
16. Employed quality surveillance measures during pumping operations.	—	—
17. Observed operations for any safety or environmental infractions and stop operations immediately if any violations are found and correct them.	—	—
18. Maintained communications with chain of command and render status reports as required by unit policy.	—	—
19. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all steps are passed. Score the Soldier NO-GO if any steps are failed. If the Soldier scores NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**  
FM 10-67-1

**Related**  
DA PAM 750-8  
FM 3-100.12  
FM 3-100.4  
FM 5-482  
TM 10-4320-307-10  
TM 5-4320-305-10

## Direct Installation of Petroleum Valves and Pipeline Sections

101-92F-3309

**Conditions:** Given the requirement to direct the installation and maintenance of an operational Inland Petroleum Distribution System (IPDS) system in a field environment. Personnel and materials required to perform task: eight military occupational specialty (MOS)-qualified (92F) Soldiers; pre-selected pipeline/hose line trace, unit standing operating procedure (SOP), Facility Response Plan (FRP), and Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required), risk management procedures, applicable Material Safety Data Sheets (MSDS), all necessary tools and equipment, and full access to all reference materials.

**Standards:** Direct the safe maintenance and installation and monitoring of petroleum pipeline sections, ensuring fuel leaks are detected and repairs are made, without injury to personnel, damage to equipment, or pollution of the environment.

### Performance Steps

#### WARNING

**A constant fire and hazards explosion exists on a pipeline because of the fuels. Repair teams should use an explosimeter to determine how explosive and toxic an area is before entering it. When disconnecting a pipeline to replace damaged pipe or fittings or when a line break occurs, immediately shutdown the line and close the closest block valves on each side of the break to capture as much of the fuel as possible before it becomes a fire hazard. Every opening could be a potential fire. Fire-fighting troops should accompany repair crews on major repair assignments.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Implement environmental stewardship measures according to critical task 101-92F-3312.
3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with operations order (OPORD), unit SOP, and specific guidelines that pertain to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish the mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous waste/hazardous material (HW/HM) management and environmental hazards.
  - f. Discuss specific guideline that pertains to Maintenance and Installation of Petroleum Valves and Pipeline Sections.
    - (1) Procedures for temporary and permanent repairs.

**Performance Steps**

- (2) Communication procedures.
  - (3) Pipeline patrols.
4. Conduct Pre-combat Checks and Pre-combat Inspections.
    - a. Inspect personnel uniforms and equipment for serviceability and in conformity to mission, weather, or environment.
    - b. Check that appropriate personal protective equipment (PPE) is on hand.
    - c. Check operator license, dispatch, and preventive maintenance checks and services (PMCS) records.
    - d. Check applicable reference materials and ensure they are on hand.
    - e. Inspect communication equipment and personnel knowledge on communication procedures and operating instructions.
  5. Maintain communications with lower and higher echelon and render reports as required.
  6. Identify training and cross-training for all personnel performing sampling and gaging.
  7. Project maintenance and repair requirements.
  8. Coordinate shutdown of pipeline to install new sections of pipe or to replace valves as needed.
  9. Ensure pipeline sections are evacuated in an environmentally safe manner. Dispose of fuel properly in accordance with applicable environmental laws and regulations.
  10. Ensure proper testing procedures are conducted on pipeline in accordance with unit tactical SOP (TSOP).
    - a. Ensure the following prior to testing pipeline.
      - (1) Test communications systems.
      - (2) Check accuracy of all gages.
      - (3) Make sure enough repair clamps are on hand.
      - (4) Move in fire fighting equipment.
      - (5) Make sure a tank vehicle and drums are nearby in case a section of line has to be drained.
      - (6) Make sure shovels and material to dig and line a pipe are at the test site in case there is a spill.
      - (7) Divide pipeline into test sections.
    - b. When performing pipeline test with fuel consider:
      - (1) The test section should be outside of a city or heavily populated area.
      - (2) Each building within 300 feet of the test section should be empty of people.
      - (3) The test section should be watched by a patrol during the test.
      - (4) The people running the test should be in constant contact with the patrol.
      - (5) The fuel used should be a low grade, non-critical fuel that does not vaporize quickly.
  11. Observe operations for safety and environmental infractions. Take appropriate action(s) immediately if any violations are discovered to correct them.
  12. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Employed environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensured personnel are knowledgeable on Concept of Operations.	—	—
4. Conducted Pre-combat Checks and Pre-combat Inspections.	—	—
5. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
6. Identified training and cross-training for all personnel performing sampling and gaging.	—	—
7. Projected maintenance and repaired requirements.	—	—
8. Coordinated shutdown of pipeline to install new sections of pipe or to replace valves as needed.	—	—
9. Ensured pipeline sections are evacuated in an environmentally safe manner. Disposed of fuel properly in accordance with applicable environmental laws and regulations.	—	—
10. Ensured proper testing procedures are conducted on pipeline in accordance with unit tactical SOP (TSOP).	—	—
11. Observed operations for safety and environmental infractions.	—	—
12. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**  
 FM 10-67-1  
 FM 5-482

**Related**  
 DA PAM 750-8  
 FM 3-100.12  
 FM 3-100.4

## Direct Transfer Operations

### 101-92F-3316

**Conditions:** Given the requirement to direct tank farm manifold valves to set up transfer operations in a field environment. Personnel and materials required to perform the task: eight military occupational specialty (MOS)-qualified (92F) Soldiers; an operating petroleum terminal, transfer order, personal protective equipment (PPE), risk management procedures, applicable Material Safety Data Sheets (MSDS), communications equipment, Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP), unit standing operating procedure (SOP), DA Form 2765-1 (Request for Issue or Turn-in), DA Form 3643 (Daily Issues of Petroleum Products), DA Form 3644 (Monthly Abstract of Issues of Petroleum Products and Operating Supplies), DA Form 4786 (Petroleum Products - Tank Farm Intake Record), DA Form 5463-R (Petroleum Products Tank Farm Outturn Record), DA Form 5464-R (Petroleum Products Pipeline Leakage Report), DD Form 250 (Materiel Inspection and Receiving Report), DD Form 250-1 (Tanker/Barge Materiel Inspection and Receiving Report), and full access to all reference materials.

**Standards:** Direct a transfer operation in a terminal in accordance with pumping order and operations order (OPORD) without injury to personnel, damage to the equipment, or pollution of the environment.

### Performance Steps

#### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Implement environmental stewardship measures according to critical task 101-92F-3312.
3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operations in accordance with OPORD, unit SOP, and specific guideline that pertain to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish the mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous waste/hazardous material (HW/HM) management and environmental hazards.
  - f. Discuss specific guideline that pertains to Transfer Operations.
    - (1) Daily pumping orders.
    - (2) Type of transfer.
      - (a) Receiving from pipeline.
      - (b) Issuing to pipeline.
      - (c) Loading and unloading tankers, barges, rail tank cars, and tank trucks.
      - (d) Intraterminal.

### Performance Steps

- (3) Maintaining records and reports.
- (4) Communications.
- (5) Sampling procedures.
- (6) Process of records and reports for accountability of product.

4. Conduct Pre-combat Checks and Pre-combat Inspections.
5. Ensure personnel are knowledgeable on entire system and procedures for transfer operations.
6. Direct transfer operations according to transfer order, unit SOP, FM 10-67-1, MIL-HDBK-1022A, and MIL-STD-3004A.
  - a. Follow general operating rules and procedures according to FM 10-67-1.
  - b. Process records and reports as required by SOP.

NOTE: There are many documents used for accounting for receipt, issue, and stocks on hand within a bulk petroleum facility. DA Form 3643, DA Form 3644, DA Form 2765-1, DA Form 4786, DA Form 5463-R, DA Form 5464-R, DD Form 250, and DD 250-1. Illustrations and procedures for completing forms can be found in AR 710-2-1 and DOD 4140.25-M.

- (1) Maintain Class III Status Report.
  - (a) Supply point number.
  - (b) Date.
  - (c) Report period.
  - (d) Receipts of product, by type, into the terminal.
  - (e) Total amount of product on hand, by type, in storage tanks, tank vehicles, barges, and package at the end of the period.
  - (f) Total ullage available for specific products by tank designation at the end of the period.
  - (g) Information on unusable storage.

NOTE: Location and causes of leaks, ruptures, or other damage; other reasons for unusable storage space; and anticipated changes in ullage due to maintenance are all reported.

- (h) Estimated requirements and issues, by type, for the next 24-hour period.
- (2) Maintain daily terminal inventory report.
  - (a) Military inventory in shore tankage.
  - (b) Commercial inventory in shore tankage allocated for military use.
  - (c) Usable inventory aboard floating storage.
  - (d) Days of supply on hand.
  - (e) Usable inventory in port tankers being discharged or awaiting discharge.

7. Direct and control flow of product.
  - a. Process requirements for bulk Class III submitted to Company for each district supervised.
  - b. Evaluate necessity for use of transportation other than pipeline within the district supervised.
  - c. Assures that strict accountability is kept of all products in system.
  - d. Process request for issues or receipt for each district supervised, and then routes them to petroleum Operations Officers through Petroleum Dispatching Supervisor.
  - e. Maintain communication with Battalion Headquarters.
  - f. Maintain communications with pump and terminal attendants.
  - g. Schedule inventories.
  - h. Maintain radio net.
    - i. Direct pressure testing of pipeline/hoseline to locate leaks.
    - j. Issue shutdown procedures when necessary.
  - k. Prepare consumption graphs.
    - l. Prepare monthly pipeline schedules.
  - m. Prepare daily pumping schedules one week in advance of pumping.
  - n. Prepare daily pumping order.
  - o. Relay pumping orders and adjustments to operating platoon's headquarters.
  - p. Assign batching numbers to product when it is put on-line.
  - q. Monitor hourly pumping and delivery reports for adherence to daily pumping order.



**Performance Steps**

- r. Forward daily pumping and delivery report to battalion dispatcher in petroleum operations branch.
  - s. Maintain DA Form 1594 (Daily Staff Journal or Duty Officer's Log).
8. Project maintenance and repair requirements.
  9. Maintain communications with chain of command and render transfer status reports as required by unit policies and procedures to supervisor.
  10. Observe operation for safety and environmental infractions. Stop operations immediately if violations occurred and take appropriate actions.
  11. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensured personnel are knowledgeable on Concept of Operations.	—	—
4. Conducted Pre-combat Checks and Pre-combat Inspections.	—	—
5. Ensured personnel were knowledgeable on entire system and procedures for transfer operations.	—	—
6. Directed transfer operations according to transfer order, unit SOP, FM 10-67-1, MIL-HDBK-1022A, and MIL-STD-3004A.	—	—
7. Directed and controlled flow of product.	—	—
8. Projected maintenance and repair requirements.	—	—
9. Maintained communications with the chain of command and rendered transfer status reports as required by unit policies and procedures to the supervisor.	—	—
10. Observed operation for safety and environmental infractions. Stopped operations immediately if violations occurred and took appropriate actions.	—	—
11. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2765-1  
DA FORM 3643  
DA FORM 3644  
DA FORM 4786  
DA FORM 5463-R  
DA FORM 5464-R  
DD FORM 250  
DD FORM 250-1  
DOD 4140.25-M  
FM 10-67-1  
MIL-STD-3004A

**Related**

AR 200-1  
DA PAM 710-2-1  
FM 100-14  
FM 3-100.12  
FM 3-100.4  
MIL-HDBK-1022A  
TM 10-4210-235-13  
TM 10-4320-307-10  
TM 5-3835-220-13&P  
TM 5-4320-305-10

## Direct Tactical Petroleum Terminal (TPT) Operations

### 101-92F-3505

**Conditions:** Given the requirement to direct the assembly and operation of a Tactical Petroleum Terminal (TPT) system in a field environment. Personnel and materials required to perform task: forty-three military occupational specialty (MOS)-qualified (92F) Soldiers, transport equipment and primary components of Tactical Petroleum Terminal (TPT), which consist of three fuel units, Tank Farm Assemblies, with two 5,000 barrel (bbl) fabric tanks each, a Tanker Truck Receipt Manifold, a Fuel Dispensing Assembly, a Transfer Hoseline Assembly, six Fire Suppression Assemblies, an Optional Tank Configuration and a Fuel Unit Support Assembly, petroleum products, communications equipment, risk management procedures, Material Safety Data Sheets (MSDS), personal protective equipment (PPE), communication equipment; fire extinguishers, spill kits/containment and clean up equipment, Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP) (if required), oral or written operations order (OPORD), unit standing operating procedure (SOP) on TPT operations, daily pumping order, DA Form 2765-1 (Request for Issue or Turn-in), DA Form 3643 (Daily Issues of Petroleum Products), DA Form 3644 (Monthly Abstract of Issues of Petroleum Products and Operating Supplies, DA Form 3857 (Commercial Deliveries of Bulk Petroleum Products Checklist), DA Form 4193 (Petroleum Products Pump Station Hourly Operations Record), DA Form 4786 (Petroleum Products - Tank Farm Intake Record), DA Form 5463-R (Petroleum Products Tank Farm Outturn Record), DA Form 5464-R (Petroleum Products Pipeline Leakage Report), DD Form 250 (Materiel Inspection and Receiving Report), DD Form 250-1 (Tanker/Barge Materiel Inspection and Receiving Report), and full access to all reference material.

**Standards:** Direct the unpacking, assembly, operation, operator's preventive maintenance checks and services (PMCS), fuel accountability and quality surveillance, and disassembly of the TPT without injury to personnel, damage to equipment, or pollution of the environment.

### Performance Steps

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Monitor and evaluate the execution of risk controls and incorporate into after action reviews (AARs).
2. Implement environmental stewardship measures according to critical task 101-92F-3312.
3. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with OPORD, unit SOP, and specific guidelines that pertain to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous waste/hazardous material (HW/HM) management and environmental hazards.
  - f. Discuss specific guideline that pertains to TPT.
    - (1) General operating rules for receiving, issuing, intraterminal transfer, records and reports.
    - (2) Transfer procedures to and from pipeline. Specifically procedures for handling product interface.
    - (3) Tank-Truck receipt manifold procedures.
    - (4) Fuel Dispensing procedures.
    - (5) Communication procedures.

**Performance Steps**

- (6) Maintaining records for accountability of product and pump operations.
  - (7) Fire drills.
4. Conduct Pre-Combat Checks and Pre-Combat Inspections.
- a. Inspect personnel uniforms and equipment for serviceability and in conformity with mission, weather, or environment.
  - b. Check that appropriate personal protective equipment is on hand
  - c. Check operator license, dispatch, and PMCS records.
  - d. Check equipment inventory to ensure component parts or systems are complete.
  - e. Check reference materials required (TM, FM, SOP, and so on) are available.
  - f. Check filter effectiveness test results. Ensure it is current and within specifications.
  - g. Check communications equipment and personnel knowledge on communication procedures and operating instructions.
5. Maintain communications with lower and higher echelon and render reports as required.
6. Identify training and cross-training for all personnel to include licensing for section's equipment.
7. Project maintenance and repair requirements.
8. Check site preparation and earth work.
- a. Ensure site is graded to meet drainage and slop requirements.
  - b. Verify that all sharp objects that could damage fabric tanks are removed from prepared site.
  - c. Direct construction of wooden supports to relieve stress on elbow of fabric tanks.
  - d. Direct digging of trenches and fire walls to protect storage locations.
9. Direct set up of TPT components.
- a. Brief team chiefs on their respective areas of responsibility (such as Tanker-Truck Manifold; Fuel Dispensing Assembly; switching manifold; Tank Farm Assembly; Contaminated Fuel Module).
  - b. Ensure major end items are emplaced first (floodlight sets, tanks, pumps, and fire suppression units).
  - c. Ensure components are off loaded near their prospective sites.
  - d. Ensure placement of components at prepared site are according to layout plan and appropriate TMs.
  - e. Inspect TPT prior to purging any system.
    - (1) Verify that fire extinguishers are placed at pumps, tanks, issuing points, and receiving points.
    - (2) Inspect collapsible fabric tanks for tears, punctures, and shelf life.
    - (3) Check integrity and height of tank berms - Ensure berm drain valve is closed.
    - (4) Check floodlight locations, operability, and grounding.
    - (5) Check fabric collapsible tank layout and connections.
    - (6) Check pump locations, operability, servicing, and grounding.
    - (7) Check meter-strainer flow direction and grounding.
    - (8) Check filter separator flow direction, test adapter installation, and grounding.
    - (9) Check hose line, valves, and fittings couplings closed, flanges tight, valve packing glands tight, valves in operable position and closed. No sharp bends, proper lay on tank tops, sandbags on free ends and bends subject to whip, and the general condition of the hose line.
    - (10) Check sampling assembly in operable location, joints tight, valves closed, and grounding.
    - (11) Ensure fire suppression equipment is charged, ready to operate, and in proper location.
    - (12) Ensure SAFETY and NO SMOKING signs are readable and in proper location.
    - (13) Review pressure test results and evidence of corrective action.
    - (14) Ensure road crossing protection (culverts and suspension devices) are in place as required.
    - (15) Ensure range poles are installed properly with cross cord at correct height.
    - (16) Ensure corrective painting is complete.

**Performance Steps**

- (17) Ensure equipment identification marking is correct and adequate.
- (18) Ensure portable fuel testing kit intact.
- (19) Ensure operational areas are clean.
- f. Correct faults found in inspection and then re-inspect. Do not proceed with operations until all points affecting integrity and safety of system are corrected.

## 10. Direct TPT operations.

- a. Process daily pumping order from platoon leader.
- b. Inspect empty tanks before receiving products.
- c. Ensure common lines are flushed with same product being received before taking an opening gauge.
- d. Start and stop operations slowly and carefully.
- e. Ensure valves are opened and closed slowly and pressure brought up gradually.

NOTE: A gate valve must never be forced closed. When a gate valve (rising or non-rising stem) is opened or closed, the wheel should be turned back at least one-quarter turn from the fully open or closed limit. This allows free wheel movement to show the valve is not stuck.

- f. Monitor pressure gauges so that working pressures are not exceeded.
- g. Ensure during continuous pumping operations, receiving tank should not be closed off until another tank is open.

NOTE: If the pipeline not in use, tank valves will normally be closed except where they need to be left open to relieve line pressure caused by thermoexpansion. Except to switch tanks, no more than one tank must be open to a line system unless necessary.

- h. Ensure flow into and out of tank is verified as soon as possible after start of an operation.
- i. Direct flow of product and diverted as necessary.
- j. Verify water is drained from tank after product has had time to settle.
- k. Ensure when issuing product its first in, first out policy (issue oldest stock first). Ensure products are not mixed.
- l. Verify fuel is drawn and sampled.
  - (1) Dispensing Assembly.
    - (a) Once each 4 hours of operation.
    - (b) Three checks at 15 minute intervals after filter separator is first put in operation or whenever there has been a filter change or an upset in operations.
  - (2) Tank top via pumps.
    - (a) Once per day.
    - (b) Whenever there is suspicion of contamination.
    - (c) Whenever that particular tank or module is to be transferred to another module in same TPT.
    - (d) Whenever that particular tank or module is to be transferred to the associated pipeline system, another TPT, or any other major bulk movement.
  - (3) Tank bottom drain.
    - (a) Once per week.
    - (b) Whenever there is suspicion of contamination by water or other contaminates.
    - (c) Prior to transferring tank contents elsewhere.

**CAUTION**

Contaminated tank bottoms should be drawn off and disposed of prior to transferring all of a tank to another tank, to fuel dispensing, or to the associated pipeline. Under no conditions should tank bottoms be dispensed to user vehicles.

- m. Ensure when performing intraterminal transfers that free bottom water is drawn off before transfer.
- n. Prepare daily status reports.

**Performance Steps**

- o. Conduct fire drills.
  - p. Maintain records and reports.
  - q. Ensure communications between personnel at operating points in system at all times.
  - r. Ensure quality surveillance measures are followed according to unit SOP.
  - s. Observe operations for safety and environmental violations. Take appropriate action(s) immediately if violations occur to correct the problem.
11. Ensure maintenance is performed on equipment according to task 101-92F-3302.
12. Direct disassembling of TPT system.
- a. Ensure all equipment is inventoried, cleaned, and stored in appropriate containers.
  - b. Verify that all equipment that is non-mission capable (NMC) is replaced or fixed before equipment is stored.
  - c. Maintain listing of components for each container loaded.
13. Maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Implemented environmental stewardship measures according to critical task 101-92F-3312.	—	—
3. Conducted briefing and ensured personnel are knowledgeable on Concept of Operations.	—	—
4. Conducted Pre-Combat Checks and Pre-Combat Inspections.	—	—
5. Maintained communications with lower and higher echelon and rendered reports as required.	—	—
6. Identified training and cross-training for all personnel to include licensing for section's equipment.	—	—
7. Projected maintenance and repaired requirements.	—	—
8. Checked site preparation and earth work.	—	—
9. Directed set up of TPT components.	—	—
10. Directed TPT operations.	—	—
11. Ensured maintenance was performed on equipment according to task 101-92F-3302.	—	—
12. Directed disassembling of TPT system.	—	—
13. Maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all steps are passed. Score the Soldier NO-GO if any steps are failed. If Soldier scores NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2765-1  
DA FORM 3643  
DA FORM 3644  
DA FORM 3857  
DA FORM 4193  
DA FORM 4786  
DA FORM 5463-R  
DA FORM 5464-R  
DD FORM 250  
DD FORM 250-1  
FM 10-67-1  
FM 3-100.12  
FM 3-100.4

**Related**

DOD 4140.25-M  
FM 5-482  
MIL-HDBK-1022A

Skill Level 4

Subject Area 13: CONTROLLING GENERAL PETROLUUM OPERATIONS

**Establish Petroleum Quality Surveillance Program**

**101-92F-4261**

**Conditions:** Given the requirement to establish a petroleum quality surveillance program in a field environment. Personnel and materials required to perform task: two military occupational specialty (MOS)-qualified (92F) Soldiers; an operational petroleum facility, communication equipment, risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE), pencil, paper, unit standing operating procedure (SOP), DA Form 1804 (Petroleum Sample), DA Form 2077 (Petroleum Products Laboratory Analysis Record), DA Form 3853-1 (Innage Gage Sheet (Using Innage Tape and Bob)), DA Form 3853-2 (Outage Gage and Sheet (Using Innage Tape and Bob)), DA Form 3853-3 (Outage Gage and Sheet (Using Outage Tape and Bob)), and full access to all reference materials.

**Standards:** Establish and implement a petroleum quality surveillance program to ensure proper grade and on-specification products are maintained throughout any given area of operation.

**Performance Steps**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Integrate risk management into planning and preparing for operations and training activities.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance.
2. Verify implementation environmental stewardship measures according to critical task 101-92F-3312.
3. Maintained and familiarized with applicable reference materials.
  - a. Unit SOP.
  - b. Operations order (OPORD) and Concept of Support.
  - c. Local ordinances, environmental laws, and policies.
  - d. Host Nation Support (HNS) (if overseas)
4. Identify and ensure communication equipment is on hand and mission capable.
5. Identify and ensure required personnel and equipment to accomplish task are available and mission capable.
6. Project maintenance and supply replenishment.
  - a. Identify equipment maintenance support activity.
  - b. Identify fuel additives requirements and sources.
  - c. Ensure spare parts or system components are on hand.
  - d. Establish reorder procedures for fuel additives and/or equipment that are beyond repair.
7. Prepare a unit SOP on quality surveillance. SOP should cover the following areas depending on local situation (these areas should be considered as minimum information required):
  - a. Policies and procedures for determining and maintaining petroleum quality during storage.
  - b. Policies and procedures for determining and maintaining petroleum quality while loading and unloading tankers and barges.



**Performance Steps**

- c. Policies and procedures for determining and maintaining petroleum quality while loading and unloading tank vehicles and tank cars.
  - d. Policies and procedures for determining and maintaining petroleum quality during pipeline operations.
  - e. Policies and procedures in maintaining quality standards for aviation fuels.
  - f. Policies and procedures in refueling and defueling aircraft while maintaining aviation fuel quality.
  - g. Sampling, maintenance procedures, and filter separators effectiveness testing requirements.
  - h. Marking procedures for petroleum equipment.
  - i. Environmental and safety considerations for petroleum quality surveillance operations.
  - j. Policies and procedures in maintaining quality surveillance equipment (PMCS being implemented).
  - k. Other quality surveillance procedures as dictated by higher HQ.
    - (1) Identification of unknown products.
    - (2) Captured fuel.
8. Submit TSOP on quality surveillance to Petroleum Officer for review and approval by the approving authority.
  9. Ensure personnel comply with the unit TSOP on quality surveillance once it is established.
    - a. Monitor petroleum sample tags and maintain sample logs.
    - b. Monitor sampling procedures for types of samples required for product to be tested.
    - c. Monitor Filter Effectiveness Testing for all fuelers and for strict compliance, especially when handling aviation fuels.
    - d. Monitor proper procedures in handling petroleum products.
  10. Establish and maintain records and reports according to unit SOP.
    - a. Petroleum sample tags.
    - b. Fuel Sample submission logs (locally generated form or board).
    - c. Petroleum products laboratory analysis report (DA Form 2077).
    - d. Other reports as required by higher HQ.

**Evaluation Preparation:** See task Conditions and Standards.

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
1. Applied risk management procedures.	—	—
2. Maintained applicable Material Safety Data Sheets (MSDS).	—	—
3. Maintained and familiarized with applicable reference materials.	—	—
4. Identified and ensured communication equipment is on hand and mission capable.	—	—
5. Identified and ensured required personnel and equipment to accomplish task are available and mission capable.	—	—
6. Projected maintenance and supply replenishment.	—	—
7. Prepared a unit tactical standing operating procedure (TSOP) on quality surveillance.	—	—
8. Submitted TSOP on quality surveillance to Petroleum officer for review and approval by the approving authority.	—	—
9. Ensured personnel complied with the unit TSOP once it is established.	—	—
10. Established and maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 1804  
DA FORM 2077  
DA FORM 3853-1  
DA FORM 3853-2  
DA FORM 3853-3  
FM 10-67-1  
FM 10-67-2

**Related**

AR 200-1  
AR 710-2  
FM 100-14  
FM 3-100.12  
FM 3-100.4  
TM 10-6630-247-13&P

## Develop a Petroleum Environmental Stewardship Protection Program

**101-92F-4281**

**Conditions:** Given the requirement to develop an environmental stewardship program in a field environment. The Soldier (a noncommissioned officer in charge [NCOIC] assigned to a petroleum element) must develop a petroleum environmental control program which ensures minimal pollution of the environment. Materials required to perform task: a petroleum-handling unit, paper, pencil, Facility Response Plan (FRP), Spill Prevention Response Plan (SPRP), Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required), risk management procedures, applicable Material Safety Data Sheets (MSDS), Hazardous Material Information Sheets (HMIS), the installation environmental standing operating procedure (SOP), personal protective equipment (PPE), and full access to all reference materials.

**Standards:** Develop a petroleum environmental control program which ensures pollution prevention or minimal pollution of environment.

### Performance Steps

**DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Integrate risk management into planning and preparing for operations and training activities.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance.
2. Verify applicable MSDS are maintained.
3. Maintain and familiarize with applicable reference materials.
  - a. Unit SOP.
  - b. Operations order (OPORD) and Concept of Support.
  - c. Installation Spill Control Plan (ISCP) NAME CHANGED.
  - d. Spill Prevention Response Plan (SPRP).
  - e. Spill Prevention Control and Countermeasures (SPCC) plan.
  - f. Oil Discharge Contingency Plan (ODCP) (if required).
  - g. Hazardous Material Information Sheets (HMIS).
  - h. Local ordinances, environmental laws, and policies.
4. Establish a unit SOP which reflects applicable environmental laws, regulations, and policies.
  - a. Proper use and control of chemicals and petroleum products.
  - b. Less accumulation of hazardous wastes that will require disposal.
5. Develop a petroleum environmental control program with the following elements.
  - a. Establish unit management of the environmental stewardship, which includes:
    - (1) Appointment of an environmental compliance officer or hazardous waste coordinator.

### Performance Steps

- (2) Requirement for the environmental compliance officer or hazardous waste coordinator to be trained within 30 days of being assigned to duty.
  - (3) Requirement for the environmental compliance officer or hazardous waste coordinator to maintain a file of applicable references, appointment orders, and inspection records for the last 24 months.
  - (4) Requirement for scheduled and unscheduled inspections.
  - (5) Requirement for a unit environmental training program.
  - (6) Requirement for unit personnel to be trained in environmental awareness.
  - (7) Requirement for the unit SOP to cover spill prevention and response.
  - (8) Requirement for the unit SOP to cover the hazardous communications (HAZCOM) program.
  - (9) Requirement that all applicable MSDS be maintained and available to all assigned personnel.
  - (10) Requirement that the unit has a pollution prevention/Hazardous Waste Minimization (HAZMIN) program.
  - (11) Requirement that the unit has a recycling program.
  - (12) Requirement for the unit to maintain high cleanliness standards in petroleum, oil, and lubricants (POL), hazardous material, and hazardous waste storage areas.
  - (13) Requirement that the unit minimizes detailed maintenance in the field.
  - (14) Requirement that waste storage areas are inspected weekly. Inspection is documented and records are maintained for three years.
  - (15) Requirement that uniform hazardous waste manifests are properly filled out, signed by trained personnel, tracked, and maintained properly either at unit or installation level.
  - (16) Requirement for PPE training.
- b. Used oil storage area management, that requires:
- (1) POL storage areas have adequate secondary containment (dikes, catchments, spill pallets, and so forth).
  - (2) Used oil and other contaminated products are stored in authorized containers and properly labeled.
  - (3) Used oil storage tanks are monitored on a regular basis and emptied as required.
  - (4) Only authorized personnel have access to the storage containers.
  - (5) Spills are immediately cleaned up and material is disposed of according to the unit SOP.
- c. Hazardous Material/Hazardous Waste (HM/HW) management, which requires the following:
- (1) Only the amount of hazardous material needed is ordered.
  - (2) The unit Hazardous HM/HW inventory is up to date and no HW remains on site longer than regulatory deadlines.
  - (3) Hazardous waste is collected and stored in authorized containers.
  - (4) The HM/HW is disposed of according to directives.
  - (5) Containers are labeled according to directives.
  - (6) Containers are in good condition and closed tightly at all times except when adding materials.
  - (7) Each container is marked with accumulation start dates.
  - (8) Accumulation tanks used for collecting HW and other pollutants (antifreeze, GAA, and oil) are properly marked. Waste is segregated by type and storage procedures are adhered to.
  - (9) Danger and warning signs are conspicuously placed.
  - (10) Spill prevention and control equipment is adequate.
  - (11) Personnel are trained in the proper handling, collection, storage, and transportation of HM/HW.
  - (12) Used POL cans and drums are being disposed of properly according to applicable environmental regulations.
  - (13) Asbestos containing parts (brake shoes, clutch plated, and equipment insulation) are being removed, collected, and disposed of properly.
- d. Solid waste management, that requires:
- (1) Procedures to reduce production of waste are enforced.

**Performance Steps**

- (2) Product separation and recycling efforts are in effect.
- (3) Source reduction practices are enforced.
- (4) The unit is requesting supplies only as needed (no stockpiling).
- (5) Water, soap, kitchen grease, or garbage is never discharged into the street, storm drainage system, or groundwater source.
- e. Spill prevention management that requires:
  - (1) Oil, fuel, or other hazardous pollutant spills (over 5 gallons in volume or 100 square feet in area) or any detectable amount onto water are reported immediately according to local SOP.
  - (2) Creek/drainage channels are free of pollution.
  - (3) Pollutants are never discharged into storm or wash rack drains or poured on the ground or along fence lines (common pollutants are oil, solvent, soap, diesel, gasoline, battery acid, chemicals waste, antifreeze, paint, and grease).
  - (4) Small oil spills are cleaned in a timely manner.
  - (5) Drip pans are used under vehicles/equipment and POL product barrels, whenever spills are likely to occur.
  - (6) Contaminated soil is properly disposed of (soil is taken to a designated authorized disposal area).
- f. Recycling program management, that requires:
  - (1) Contaminated soil is properly disposed of (soil is taken to a designated authorized disposal area).
  - (2) The unit is delivering material to the installation recycling center.
  - (3) Recyclable materials sources are separated (that is, separate collection containers for paper, aluminum, and other items).
  - (4) The unit recycles the following materials:
    - (a) Computer printouts.
    - (b) Computer punch cards.
    - (c) High grade paper.
    - (d) Corrugated cardboard.
    - (e) Newspaper.
    - (f) Aluminum cans.
    - (g) Steel cans.
    - (h) Glass.
  - (5) Dumpsters are free of recyclable items.
  - (6) Used cleaning solvents are being recycled/collected properly.
- g. Unit wash rack operations management, that requires:
  - (1) Vehicles and equipment are washed only in authorized wash racks.
  - (2) Equipment is used only in an authorized wash rack.
  - (3) Wash racks and vicinity are free of contaminated soil, sand, or silt.
  - (4) Solvents or soap is not used.
  - (5) Metal gratings or baffles at the wash rack oil interceptor, catch basins, or flood drains are present and serviceable.
  - (6) Wash rack area is free of oil and/or fuel spills.
  - (7) Treatment devices (oil and grease interceptors, catch basins, collection ponds, drains, and tanks) are properly maintained and serviced.
  - (8) The wash rack area is free of oil, rags, and trash.
  - (9) Only authorized soap, solvent, or chemicals are used with steam cleaning equipment.
  - (10) The oil/water separator is in good working condition.
  - (11) Vehicle/equipment/aircraft wastewater discharge is tied into a treatment system.
- h. Land management, that requires:
  - (1) Vehicles are parked or driven only in authorized areas.
  - (2) Surface areas and curbs are free of vehicular damage.
  - (3) Vehicle parking areas are free of litter.
  - (4) Gravel is used only in authorized areas and in an authorized manner.
  - (5) Archeological or historical sites are safeguarded.

**Performance Steps**

- (6) Live or dead trees or limbs are felled, removed, or used only with approval (range control/forester).
- (7) Unit personnel know the correct procedures for disposing of garbage, refuse, and rubbish in range areas.
- (8) Storm water ditches in the vicinity of motor pools are free of POL or other HM/HW.
- (9) Detention ponds, waste and sump collection points, and vehicle inspection points are functional and being serviced properly.
- (10) Paint spray, battery, and radiation repair operations are operated properly and coordinated with the environmental management officer and safety and preventive medicine officers.
- (11) Collection points are established with the proper containers and servicing for all maintenance generated wastes.
- (12) The unit follows procedures for fording streams which prevent environmental damage and uses only operational fording areas.
- (13) The unit follows local range procedures for digging and covering fighting positions in the local range area.
- (14) The unit's refueling operation SOP addresses practices to minimize spills.
- (15) The unit has on hand material to clean up spills (spill kits).
- (16) Fuel handlers know how to report a spill.
- i. Storm water pollution prevention measures, that include:
  - (1) Dumpster lids are to be kept closed.
  - (2) Inspect all drip pans for accumulated water and remove when appropriate.
  - (3) Use dry sweep or other absorbent materials to clean up spills.
  - (4) Disposal of contaminated dry sweep according to unit SOP.
  - (5) All hazardous materials to be stored on secondary containment pallets or in an area with secondary containment.
  - (6) All drain valves located on above ground storage tank (AST) secondary containment dikes will remain closed until visually inspected for contaminates.
  - (7) In garrison, maintain grassed areas to prevent erosion and corresponding run off.
  - (8) Conduct a visual inspection daily.
  - (9) Maintain an inventory of all hazardous materials.
  - (10) Train unit personnel in storm water measures.
  - (11) Reduce the exposure of hazardous materials to storm water whenever possible (cover with tarpaulins, store indoors, and so forth).
6. Coordinate the development of the petroleum environmental control program with the unit Environmental Compliance Officer (ECO).
7. Monitor proper procedures to contain and clean up oil spills in all environments by using available equipment.
8. Verify that personnel know spill cleanup procedures and spill reporting procedures according to the FRP and SPRP.
9. Monitor all operations to ensure compliance with applicable environmental laws, policies, and regulations.
10. Check that contaminated fuel and other waste materials are collected and disposed of in an environmentally safe manner.
11. Check that assigned personnel receive comprehensive environmental training and briefing prior to performance of mission.
12. Establish and maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Verified applicable MSDS are maintained.	—	—
3. Maintained and familiarized with applicable reference materials.	—	—
4. Established procedures to contain and clean up oil spills in all environments using available equipment.	—	—
5. Verified that personnel know spill cleanup procedures and spill reporting procedures according to the ISCP and SPRP.	—	—
6. Monitored all operations to ensure compliance with applicable environmental laws, policies, and regulations.	—	—
7. Checked that contaminated fuel and other waste materials were collected and disposed of in an environmentally safe manner.	—	—
8. Checked that assigned personnel received comprehensive environmental training.	—	—
9. Established a unit SOP which reflects applicable environmental laws, regulations, and policies.	—	—
10. Developed a petroleum environmental control program.	—	—
11. Coordinated the development of the petroleum environmental control program with the unit Environmental Compliance Officer (ECO).	—	—
12. Established and maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

- AR 200-1
- FM 10-67-1
- FM 3-100.12
- FM 3-100.4

**Related**

- FM 100-14

**Plan a Petroleum Fire Prevention and Safety Program**

**101-92F-4311**

**Conditions:** Given the requirement to develop a unit tactical standing operating procedure (TSOP) to Plan a Petroleum Fire Prevention and Safety Program in a field environment. The Soldier (a noncommissioned officer in charge [NCOIC] assigned to a petroleum element) must develop a unit TSOP Plan a Petroleum Fire Prevention and Safety Program to ensure a safe work area for personnel and maximum protection for facilities and equipment. Materials required to perform task: a petroleum facility, fire fighting equipment, paper, pencil, Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required), Hazardous Material Information Sheets (HMIS), unit's standing operating procedure (SOP), risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE), and full access to all reference materials.

**Standards:** Develop a unit TSOP to Plan a Petroleum Fire Prevention and Safety Program to ensure a safe environment for personnel and maximum protection for facilities and equipment.

**Performance Steps**

1. Recognize hazards within area of responsibility.
2. Determine number of personnel working in the area.
3. Ensure personnel receive first aid and fire fighting training.
4. Ensure first aid equipment is located in the area.
5. Determine if equipment is operating in the area without flame and spark arresters.
6. Determine if spills or leaks and vapors present a problem in the area.
7. Take corrective actions as necessary.
8. Develop a unit fire and safety SOP which includes fire fighting plans and fire evacuation plans.
  - a. Publish unit fire and safety SOP and post in a conspicuous place upon approval.
  - b. Ensure fire and safety SOP was briefed to whole unit personnel and schedule training.
9. Inspect the area regularly to ensure compliance with the fire and safety program.
10. Conduct fire drills monthly (at a minimum) to check validity of fire fighting plans and evacuation plans.
11. Review the accident report according to local policy.
12. Establish and maintain records and reports according to unit SOP.
  - a. Fire fighting and safety training/drills.
  - b. Accident reports.
  - c. Other incident or event that require recording and reporting.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Recognized hazards within area of responsibility.	—	—
2. Determined number of personnel working in the area.	—	—
3. Ensured personnel receive first aid and fire fighting training.	—	—



<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
4. Ensured first aid equipment is located in the area.	—	—
5. Determined if equipment is operating in the area without flame and spark arresters.	—	—
6. Took corrective actions as necessary.	—	—
7. Developed a unit fire and safety SOP which includes fire fighting plans and fire evacuation plans.	—	—
8. Inspected the area regularly to ensure compliance with the fire and safety program.	—	—
9. Ensured personnel received first aid and fire fighting training.	—	—
10. Conducted fire drills monthly (at a minimum) to check validity of fire fighting plans and evacuation plans.	—	—
11. Reviewed the accident report according to local policy.	—	—
12. Established and maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

#### References

##### Required

FM 10-67-1  
TM 5-315

##### Related

FM 100-14  
FM 3-100.12  
FM 3-100.4

## Manage Accountability of Petroleum Products

101-92F-4312

**Conditions:** Given the requirement to perform inventory management and accountability for petroleum products in a field environment. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers; physical inventory management data, receipt and issue documents, pencil, paper, DA Form 3643 (Daily Issues of Petroleum Products), DA Form 3644 (Monthly Abstract of Issues of Petroleum Products and Operating Supplies), DA Form 3853-1 (Innage Gage and Sheet (Using Innage Tape and Bob)), DA Form 4702-R (Monthly Bulk Petroleum Accounting Summary) or DA Form 4702-R-E (Monthly Bulk Petroleum Accounting Summary (EGA)), DA Form 5831-R (Petroleum Product Inventory Control Sheet), and full access to all reference materials.

**Standards:** Perform inventory management and accountability for petroleum products ensuring authorized quantity of fuel are on hand for each organization.

### Performance Steps

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Integrate risk management into planning and preparing for operations and training activities.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance.
2. Ensure communication equipment is on hand and mission capable.
3. Ensure required personnel and equipment to accomplish task are available and mission capable.
4. Verify that all receipts, issues, transfers, losses, adjustments, and physical inventories of petroleum products are correctly documented.
5. Verify that proper procedures are used in accounting for bulk petroleum.
  - a. Bulk petroleum tanks are gauged daily (if receipt or issues has occurred), weekly (if no activity) and monthly (for all tanks).
  - b. Record inventory results on DA Form 3853-1 for monthly inventories and DA Form 5831-R for all other inventories.
  - c. Ensure quantities of product that equal or exceed 3500 gallons are volume corrected.
  - d. Ensure loss of fuel over 25 gallons due to spillage or contamination are documented, along with issues, receipts, and inventory documents.
6. Verify that the allowable loss for petroleum products is correctly calculated as the following.
  - a. Allowable loss for jet fuels (other than JP-8), aviation gasoline (AVGAS), and other gasolines = + or -1 percent of the total opening inventory plus receipts for the month.
  - b. Allowable loss for all fuels (including JP-8) = + or - one half of 1 percent of the total opening inventory plus receipts for the month.
7. Analyze and resolve any abnormal accounting problems. Initiate the appropriate property accountability actions. When the loss exceeds the allowable loss and the entire loss exceeds a value of \$500, initiate a report of survey. When a loss exceeds the allowable loss, but has a value of less than \$500, initiate causative research. Attach a copy of the causative research to the monthly inventory.

**Performance Steps**

8. Fill out appropriate forms for petroleum accounting records and reports.
  - a. DA Form 3644 summarized information from DA Form 3643.
  - b. DA Form 4702-R or DA Form 4702-R-E reports all loses or gains revealed by the inventories.
  - c. Check accounting records and fill out appropriate forms or reports.
9. Develop a unit tactical standing operating procedure (TSOP) on Management and Accountability for POL products which incorporates inventory, accountability, and pilferage control procedures.
  - a. Ensure bulk petroleum product accountable officer is appointed and appointment orders are maintained.
  - b. Ensure all required forms are on hand and required information is annotated.
  - c. Ensure seal custodians are appointed in writing and knowledgeable.
  - d. Ensure all personnel performing issue and receipt operations are knowledgeable on inventory management and accountability procedures.
10. Establish and maintain records and reports according to unit SOP.
  - a. Accountability and Inventory.
  - b. Petroleum Quality Maintenance.
  - c. Other incident or event that require recording and reporting.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Ensured communication equipment is on hand and mission capable.	—	—
3. Ensured required personnel and equipment to accomplish task are available and mission capable.	—	—
4. Verified that all receipts, issues, transfers, losses, adjustments, and physical inventories of petroleum products are correctly documented in accordance with lower skill level task.	—	—
5. Verified that proper procedures were used in accounting for bulk petroleum.	—	—
6. Verified that allowable loss for petroleum products is correctly calculated.	—	—
7. Analyzed and resolved any abnormal accounting problems.	—	—
8. Filled out appropriate forms for petroleum accounting records and reports.	—	—
9. Developed a unit tactical standing operating procedure (TSOP) on Management and Accountability which incorporate inventory, accountability, and pilferage control procedures.	—	—
10. Established and maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

AR 710-2  
DA FORM 3643  
DA FORM 3644  
DA FORM 3853-1  
DA FORM 4702-R  
DA FORM 4702-R-E  
DA FORM 5831-R  
DA PAM 710-2-1  
DA PAM 710-2-2  
FM 10-67-1  
FM 3-19.30  
MIL-STD-3004A

**Related**

## Plan a Sling Load Operations

101-92F-4314

**Conditions:** Given the requirement to direct transportation of packaged petroleum products (500-gallon collapsible drums) by air. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers; helicopter, risk management procedures, applicable Material Safety Data Sheets (MSDS), packaged petroleum products, fabricated static electricity discharge probe, clevis assembly, slings, tape, personal protective equipment (PPE), helmet, goggles, earplugs, shock proof gloves or leather gloves, A-22 cargo bag, multiple-leg sling set, spill control and cleanup equipment, grounding rod, DA Form 7382-R (Sling Load Inspection Record), and full access to all reference materials.

**Standards:** Plan sling load operations, ensuring the cargo is properly rigged for transport without loss of cargo, damage to equipment, or injury to personnel in accordance with applicable environmental regulations and policies.

### Performance Steps

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Integrate risk management into planning and preparing for operations and training activities.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance.
2. Maintain and familiarize with applicable reference materials.
  - a. Operations plan (OPLAN) or tactical standing operating procedure (TSOP).
  - b. FM 10-450-4 and FM 10-67-1
  - c. Installations or local policies, environmental laws and policies.
3. Identify and ensure communication equipment is on hand and mission capable.
4. Identify and ensure appropriate personnel and equipment required to accomplish the task are available and mission capable.
  - a. Determine the type and quantity of equipment and the number of people.
  - b. Schedule training or rehearsal.
5. Verify that maintenance and supply replenishment are projected.
6. Coordinate with aviation support unit to determine the maximum load weight required, load configuration, and number of helicopters available to perform a lift mission. Using this information, determine the number of sling loads required to move a given amount of cargo.
7. Select a site for sling load operations. If possible, the site should be:
  - a. Level.
  - b. Open enough to offer easy access for helicopters.
  - c. Easily accessible to vehicles bringing the load to the site.
  - d. Easy to secure, both for safety and tactical reasons.
  - e. Away from waterways and other environmentally sensitive areas.
8. Develop and disseminate an operations order which gives details of the mission (who, what, when, and where). Include the applicable environmental and safety considerations.
9. Maintain continuous coordination up and down the chain of command and with supporting aviation units to monitor conditions which may cause last minute changes to the mission.

**Performance Steps**

10. Establish and maintain records and reports according to unit SOP.
  - a. Accountability and Inventory.
  - b. Petroleum Quality Maintenance.
  - c. Other incident or event that require recording and reporting.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Maintained and familiarized with applicable reference materials.	—	—
3. Identified and ensured communication equipment is on hand and mission capable.	—	—
4. Identified and ensured required personnel and equipment to accomplish task are available and mission capable.	—	—
5. Verified that maintenance and supply replenishment are projected.	—	—
6. Coordinated with aviation support unit to determine the maximum load weight required, load configuration, and number of helicopters available to perform a lift mission. Using this information, determined the number of sling loads required to move a given amount of cargo.	—	—
7. Selected a site for sling load operations.	—	—
8. Developed and disseminated an operations order which gives details of the mission (who, what, when, and where). Included the applicable environmental and safety considerations.	—	—
9. Maintained continuous coordination up and down the chain of command and with supporting aviation units to monitor conditions which may cause last minute changes to the mission.	—	—
10. Established and maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**  
 DA FORM 7382-R  
 FM 10-450-4

**Related**

## Subject Area 14: CONTROLLING TANK VEHICLES

**Control ROM Site****101-92F-4302**

**Conditions:** Given the requirement to control fueling operations in a field environment. The Soldier (a Platoon Sergeant assigned to a Class III platoon) must control the fuel dispensing and receiving operations at a Refuel on the Move (ROM) site ensuring all safety, quality surveillance, accountability, and security procedures for tank vehicle operations are followed. Personnel and materials required to perform task: ten military occupational specialty (MOS)-qualified (92F) Soldiers; petroleum tank vehicles, standard ROM kits, communication equipment, source of resupply, risk management procedures, applicable Material Safety Data Sheets (MSDS), personal protective equipment (PPE), area at least 550 feet long and 150 feet wide, Facility Response Plan (FRP); Spill Prevention Control and Counter-measures (SPCC) plan; unit hazardous waste/hazardous material (HW/HM) management policy; unit standing operating procedure (SOP); oral or written operations order (OPORD); and full access to all reference materials. The area is secure and no enemy contact is expected. Vehicles to be refueled are on hand.

NOTE: Fueling or defueling will be suspended when electrical storms are within a 3-mile radius of such operations.

**Standards:** Control the fuel dispensing and receiving operations at a ROM site ensuring all safety, quality surveillance, accountability, and security procedures for tank vehicle operations are followed.

**Performance Steps****DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

**WARNING**

**Due to safety considerations, normal vehicle refueling is done with the engine off. AR 385-55 states that commanders will apply all normal safety standards to their operations unless it is necessary to change do to the mission. In training situations, changes may be authorized only by the commander. Commanders will evaluate the significance of the assumed risk versus the training benefit. In combat operations, commanders will make decisions based on Mission, Enemy, Terrain, Troops and Time Available (METT-T) and risk analysis.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters.

### Performance Steps

- b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Integrate risk management into planning and preparing for operations and training activities.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance
2. Maintain and familiarize with applicable reference materials.
    - a. Unit SOP.
    - b. OPORD and Concept of Support.
    - c. Local ordinances, environmental laws, and policies.
    - d. Host Nation Support (HNS) (if overseas).
  3. Ensure communication equipment is on hand and mission capable.
  4. Ensure required personnel and equipment to accomplish task are available and mission capable.
    - a. Inspect individual readiness according to unit SOP prior to mission.
    - b. Review load plans prepared by section noncommissioned officer in charge (NCOIC) ensure they are sufficient to accomplish mission.
  5. Project maintenance and supply replenishment.
    - a. Identify equipment maintenance support activity.
    - b. Ensure spare parts or system components are on hand.
    - c. Establish reorder procedures for repair parts or equipment that are beyond repair.
  6. Perform reconnaissance within OPORD and select site. Use the following criteria when selecting site:
    - a. Level ground away from waterways or other environmentally sensitive areas.
    - b. An area at least 550 feet long and 150 feet wide (per ROM kit used), with ground firm enough to support heavy vehicles.
    - c. Ease of movement into and out of site for both fuel resupply vehicles and vehicles being refueled.
    - d. Vehicle marshaling areas near entrance and exits to ROM site.
    - e. Ease of security (for both tactical and safety reasons) and cover and concealment.
    - f. Location is away from populated areas.
    - g. Do not set up upstream of troop concentrations.
  7. Brief Section Sergeants on mission and delegate responsibilities accordingly.
  8. Coordinate with military police for traffic control support at site.
  9. Monitor ROM operations.
    - a. Ensure site is operated according to OPORD, and unit SOP.
    - b. Ensure personnel and equipment required by OPORD are on hand.
    - c. Check site for scheduled movement of supported units into and out of site.
    - d. Check status of fuel stocks on site ensure there in compliance with refuel criteria established in OPORD.
    - e. Check movement of resupply stocks into and out of site.
    - f. Collect status of ROM operation and provide reports as required in unit SOP.
    - g. Troubleshoot problems as they occur and report schedule deviations and any problems to chain of command.
    - h. Ensure maintenance programs supports the following:
      - (1) Provide objectives that allow for timely maintenance procedures to be performed in accordance with applicable TMs.
      - (2) Maintain equipment in a state of repair that prolongs life cycle of equipment.
      - (3) Provide training on troubleshooting and maintenance procedures.
      - (4) Maintain accurate record keeping for maintenance procedures.



**Performance Steps**

- i. Stop operations immediately, if safety violations or environmental infractions occur are detected.
  - j. Recommend corrective action, as necessary, to rectify deficiencies.
  - k. Provide recommendations to improve operations.
10. Enforce fire and safety awareness.
    - a. Check that operators follow safety procedures according to FM 10-67-1, and other applicable references.
    - b. Ensure that MSDS are on hand and accessible.
    - c. Ensure Soldiers are familiar with first aid procedures for handling fuel.
    - d. Ensure first aid equipment such as eyewash stations are accessible and ready for use.
    - e. Ensure fire extinguishers are fully charged and properly placed for Soldiers accessibility.
  11. Monitor quality surveillance and control to ensure fuel are within specifications (on grade [OG] or at least sufficient for use [SFU]).
  12. Monitor accountability of petroleum products and collect forms or reports.
  13. Consolidate all data from fuel accountability forms and provide reports according to unit SOP.
  14. Monitor pilferage control in compliance with unit SOP.
  15. Monitor environmental procedures ensure personnel comply with unit policies, local, and state laws.
  16. Establish and maintain records and reports according to unit SOP.
    - a. Accountability and Inventory.
    - b. Petroleum Quality Maintenance.
    - c. Other incident or event that require recording and reporting.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Maintained and familiarized with applicable reference materials	—	—
3. Ensured communication equipment is on hand and mission capable.	—	—
4. Ensured required personnel and equipment to accomplish task are available and mission capable.	—	—
5. Projected maintenance and supply replenishment.	—	—
6. Performed reconnaissance within OPORD and selected site.	—	—
7. Briefed Section Sergeants on mission and delegated responsibilities accordingly.	—	—
8. Coordinated with military police for traffic control support at site.	—	—
9. Monitored ROM operations.	—	—
10. Enforced fire and safety awareness.	—	—
11. Monitored quality surveillance and control to ensure fuel are within specifications (on grade [OG] or at least sufficient for use [SFU]).	—	—
12. Monitored accountability of petroleum products and collected forms or reports.	—	—
13. Consolidated all data from fuel accountability forms and provided reports according to unit SOP.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
14. Monitored pilferage control in compliance with unit SOP.	—	—
15. Monitored environmental procedures ensured personnel comply with unit policies, local, and state laws.	—	—
16. Established and maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**  
FM 10-67-1

**Related**  
FM 100-14  
FM 3-100.12  
FM 3-100.4  
TC 63-1  
TM 9-2330-330-14&P  
TM 9-2330-398-10

## Manage Petroleum Tank Vehicle Operations

### 101-92F-4305

**Conditions:** Given the requirement to control fueling operations by petroleum tank vehicles in a field environment. Personnel and materials required for task: fifty one military occupational specialty (MOS)-qualified (92F) Soldiers; 5/8-ton tractors, semi-trailers (M967, M969, M970, M1062), Refuel on the Move (ROM) system, Heavy Extended Mobility Tactical Truck (HEMTT) tanker, HEMTT Tanker Aviation refueling system (HTARS) system, High Mobility Multi-purpose Wheeled Vehicle (HMMWV), communication equipment, Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP) (if required), the unit hazardous waste/hazardous material (HW/HM) management policy, an oral or written operations order (OPORD), unit standing operating procedure (SOP) on fuel support operations, and full access to all reference materials.

**Standards:** Maintain control of fueling operations (dispensing and receiving) using petroleum tanker vehicles for both aviation and ground fuels, ensuring all safety, quality surveillance, accountability, and security procedures for tank vehicles are followed.

### Performance Steps

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Integrate risk management into planning and preparing for operations and training activities.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance
2. Maintain and familiarize with applicable reference materials.
  - a. Unit SOP.
  - b. OPORD and Concept of Support.
  - c. Local ordinances, laws, and policies.
  - d. Local environmental policies and procedures on HW/HM management.
3. Ensure communication equipment is on hand and mission capable.
4. Ensure required personnel and equipment to accomplish task are available and mission capable.
  - a. Inspect individual readiness according to unit SOP prior to mission.
  - b. Review load plans prepared by section NCOIC ensure they are sufficient to accomplish mission.
  - c. Check operator license, vehicle/equipment dispatch, and PMCS.
5. Verify that maintenance and supply replenishment are projected.
  - a. Identify equipment maintenance support activity.
  - b. Identify requirements and capabilities.
  - c. Monitor compliance of quality surveillance program.
  - d. Ensure proper accountability of petroleum products are maintained.
  - e. Ensure spare parts or system components are on hand.
  - f. Establish reorder procedures for repair parts or equipment that are beyond repair.
6. Brief Section Sergeants on mission and delegate responsibilities accordingly.
7. Monitor fueling operations for both aviation and ground fuels using tank vehicles.
  - a. Ensure that loading and unloading operations are conducted according to unit SOP.
  - b. Ensure personnel and equipment required by OPORD are on hand.
  - c. Ensure that site security is maintained throughout mission.

**Performance Steps**

- d. Ensure maintenance of filter separator for all tank vehicles for model that have filter separator.
  - (1) Collect samples of petroleum products for laboratory testing.
  - (2) Forward petroleum samples to supporting petroleum laboratory.
  - (3) Ensure that petroleum sample logs are being maintained.
- e. Ensure maintenance programs supports the following:
  - (1) Provide objectives that allow for timely maintenance procedures to be performed in accordance with applicable technical manual (TM).
  - (2) Maintain equipment in a state of repair that prolongs the life cycle of the equipment.
  - (3) Provide training on troubleshooting and maintenance procedures.
  - (4) Maintain accurate record keeping for maintenance procedures.
- f. Stop operations immediately, if safety violations or environmental infractions occur are detected.
- g. Recommend corrective action, as necessary, to rectify deficiencies.
- h. Provide recommendations to improve operations.

8. Enforce fire and safety awareness.

NOTE: Ensure top loading is done only in emergency conditions when authorized by unit commander.

- a. Check that operators follow safety procedures according to FM 10-67-1 and FM 3-04.111, along with equipment applicable TMs.
- b. Ensure that Material Safety Data Sheets (MSDS) are on hand and accessible.
- c. Ensure Soldiers are familiar with first aid procedures for handling fuel.
- d. Ensure first aid equipment such as eyewash stations are accessible and ready for use.
- e. Ensure fire extinguishers are fully charged and properly placed for Soldiers accessibility.

9. Monitor quality surveillance and control to ensure fuel specifications are maintained on grade (OG) or at least sufficient for use (SFU).

10. Monitor accountability of petroleum products and collect forms or reports.

11. Monitor pilferage control for compliance with unit SOP.

12. Monitor environmental procedures ensure personnel comply with unit policies, local, and state laws.

13. Establish and maintain records and reports according to unit SOP.

- a. Accountability and Inventory.
- b. Petroleum Quality Maintenance.
- c. Other incident or event that require recording and reporting.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Maintained and familiarized with applicable reference materials.	—	—
3. Ensured communication equipment is on hand and mission capable.	—	—
4. Ensured required personnel and equipment to accomplish task are available and mission capable.	—	—
5. Verified that maintenance and supply replenishment are projected.	—	—
6. Briefed Section Sergeants on mission and delegates responsibilities accordingly.	—	—
7. Monitored fueling operations for both aviation and ground fuels using tank vehicles.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
8. Enforced fire and safety awareness.	—	—
9. Monitored quality surveillance and control to ensure fuel specifications are maintained on grade (OG) or at least sufficient for use (SFU).	—	—
10. Monitored accountability of petroleum products and collect forms or reports.	—	—
11. Monitored pilferage control for compliance with unit SOP.	—	—
12. Monitored environmental procedures ensured personnel complied with unit policies, local, and state laws.	—	—
13. Established and maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all steps are passed. Score the Soldier NO-GO if any steps are failed. If the Soldier scores NO-GO, show what was done wrong and how to do it correctly.

#### References

##### Required

DA PAM 750-8

FM 10-67-1

##### Related

FM 3-100.12

FM 3-100.4

TC 63-1

TM 10-4930-204-13

TM 5-4330-217-12

TM 5-4930-237-10

TM 9-2320-279-10-1

TM 9-2320-361-10

TM 9-2330-272-14

## Control Waterfront Operations

### 101-92F-4307

**Conditions:** Given the requirement to control waterfront fueling operations in a field environment. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers; waterborne petroleum tanker and facilities, risk management procedures, Material Safety Data Sheets (MSDS), personal protective equipment (PPE), unit standing operating procedure (SOP), Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, a partially completed DD Form 250-1 (Tanker/Barge Materiel Inspection and Receiving Report), and full access to all reference materials.

**Standards:** Control the loading or unloading of waterborne barges and tankers without commingling of products, injury to personnel, or pollution of the environment.

### Performance Steps

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters.
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Integrate risk management into planning and preparing for operations and training activities.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance.
2. Maintain and familiarize with applicable reference materials.
  - a. Unit SOP.
  - b. Operations order (OPORD) and Concept of Support.
  - c. Local ordinances, laws, and policies.
  - d. Local environmental policies and procedures on hazardous waste/hazardous material (HW/HM) management.
3. Ensure communication equipment is on hand and mission capable.
4. Ensure required personnel and equipment to accomplish task are available and mission capable.
5. Verify that maintenance and supply replenishment are projected.
  - a. Identify equipment maintenance support activity.
  - b. Monitor compliance of quality surveillance program.
  - c. Monitor proper accountability of petroleum products.
  - d. Ensure spare parts or system components are on hand.
  - e. Establish reorder procedures for repair parts or equipment that are beyond repair.
6. Verify that OPORD has been prepared after receiving notice of scheduled ship arrivals.
7. Verify customs and health authorities are notified of the tanker's arrival before it arrives.
8. Verify dock personnel are notified of arrival and departure of tanker.
9. Verify the harbormaster is notified of arrival and departure times for the tanker.
10. Verify that customs and health authorities have cleared the vessel for boarding prior to allowing personnel to board it.
11. Verify that personnel involved in the operation are briefed on safety and environmental considerations prior to beginning operations.

**Performance Steps**

12. Verify that the appropriate fire fighters and pollution control equipment are on hand and personnel are familiar with their use prior to beginning operation.
13. Verify that vessel is properly moored.
14. Verify that the appropriate number of connecting hoses is available and serviceable.
15. Verify that loading and unloading procedures are started, conducted, and completed.
16. Verify seals are installed on the tanks after the tanker is loaded and seal numbers are annotated on DD Form 250-1.
17. Inspect the DD Form 250-1 for correct information and appropriate signature as required.
18. Establish and maintain records and reports according to unit SOP.
  - a. DD Form 250-1.
  - b. Other records and reports from custom and health department.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Maintained and familiarized with applicable reference materials.	—	—
3. Ensured communication equipment is on hand and mission capable..	—	—
4. Ensured required personnel and equipment to accomplish task are available and mission capable.	—	—
5. Verified that maintenance and supply replenishment are projected.	—	—
6. Verified that OPORD has been prepared after receiving notice of scheduled ship arrivals.	—	—
7. Verified customs and health authorities are notified of the tanker's arrival before it arrives.	—	—
8. Verified dock personnel are notified of arrival and departure of tanker.	—	—
9. Verified the harbormaster is notified of arrival and departure times for the tanker.	—	—
10. Verified that customs and health authorities have cleared the vessel for boarding prior to allowing personnel to board it.	—	—
11. Verified that personnel involved in the operation are briefed on safety and environmental considerations prior to beginning operations.	—	—
12. Verified that the appropriate fire fighters and pollution control equipment are on hand and personnel are familiar with their use prior to beginning operation.	—	—
13. Verified that vessel is properly moored.	—	—
14. Verified that the appropriate number of connecting hoses were available and serviceable.	—	—
15. Verified that loading and unloading procedures are started, conducted, and completed.	—	—

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
16. Verified seals are installed on the tanks after the tanker is loaded and annotated on DD Form 250-1.	—	—
17. Inspected the DD Form 250-1 for correct information and the appropriate signature.	—	—
18. Established and maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

DD FORM 250-1  
DOD 4140.25-M  
FM 10-67-1

**Related**

AR 200-1  
FM 3-100.12  
FM 3-100.4



## **Manage Unit Maintenance of Assigned Equipment Within The Army Maintenance Management System (TAMMS)**

**101-92F-4313**

**Conditions:** Given the requirement to control a maintenance program in a field environment. Personnel and materials required to perform task: four military occupational specialty (MOS)-qualified (92F) Soldiers; tactical and/or commercial-type vehicles, unit standing operating procedure (SOP) for maintenance, DA Pamphlet 750-8, DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)), and full access to applicable reference materials.

**Standards:** Control operator maintenance and operation of assigned vehicles and equipment to ensure the vehicles and equipment are ready for operations or mission capable.

### **Performance Steps**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Integrate risk management into planning and preparing for operations and training activities.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance
2. Maintain and familiarize with applicable reference materials.
  - a. DA Pamphlet 750-8.
  - b. Vehicle and equipment technical manual (TM).
  - c. Unit maintenance SOP.
  - d. Maintenance support facility SOP.
3. Ensure communication equipment is on hand and mission capable.
  - a. Verify that communication equipment on vehicle had been maintained.
  - b. Ensure personnel are knowledgeable on Communication Single Operating Instructions (CSOI).
4. Ensure appropriate personnel and equipment required to accomplish the task are available and mission capable.
5. Verify that maintenance and supply replenishment are projected.
  - a. Identify maintenance support activity.
  - b. Ensure replacement parts are ordered and install promptly.
  - c. Ensure that spare parts required are on hand.
6. Verify that personnel are briefed on safety and environmental hazards and ways to counteract them prior to beginning operations.
7. Verify that personnel have licenses for the equipment they are assigned to operate. Conduct training program to license those who do not.
8. Verify that precautionary and safety data on vehicles and equipment are maintained (flammable, service date, no smoking, and so on).
9. Verify that all assigned equipment has the appropriate technical manuals (TMs) and lubrication orders (LOs).

**Performance Steps**

10. Verify that data entered on historical maintenance records are correct and match the data associated with assigned equipment.
11. Ensure that each assigned piece of equipment has an operator and assistant operator assigned to it.
12. Verify that proper equipment dispatch procedures are followed and DD Form 1970 or DA Form 5987-E is filled out correctly.
13. Verify that during- and after-operators PMCS are performed on equipment and annotated properly on DA Form 2404 or DA Form 5988-E.
14. Verify that operators and crews are repairing maintenance faults that they are able to correct.
15. Verify the operators and crew coordinate for maintenance support for maintenance faults they cannot correct.
16. Verify operators and crews maintenance procedures to ensure maintenance is conducted within guidelines of applicable environmental laws, regulations, policies and procedures.
17. Verify that follow up checks on deferred maintenance and parts orders are being performed. Ensure that ordered parts are being installed promptly.
18. Verify that assigned equipment receives periodic services as scheduled.
19. Establish and maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Maintained and familiarized with applicable reference materials.	—	—
3. Ensured communication equipment is on hand and mission capable.	—	—
4. Ensured appropriate personnel and equipment required to accomplish the task are available and mission capable.	—	—
5. Verified that maintenance and supply replenishment are projected.	—	—
6. Verified that personnel were briefed on safety and environmental hazards and ways to counteract them prior to beginning operations.	—	—
7. Verified that personnel had licenses for the equipment they were assigned to operate. Conducted training programs to license those who did not.	—	—
8. Verified that precautionary and safety data on vehicles and equipment are maintained (flammable, service date, no smoking, and so on).	—	—
9. Verified that all assigned equipment had the appropriate technical manuals (TMs) and lubrication orders (LOs).	—	—
10. Verified that data entered on historical maintenance records were correct and matched the data associated with assigned equipment.	—	—
11. Ensured that each assigned piece of equipment had an operator and assistant operator (if required) assigned to it.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
12. Verified that proper equipment dispatch procedures are followed and DD Form 1970 or DA Form 5987-E is filled out correctly.	—	—
13. Verified that during- and after-operations PMCS were performed on equipment and annotated properly on DA Form 2404 or DA Form 5988-E.	—	—
14. Verified that operators and crews were repairing maintenance faults that they were able to correct.	—	—
15. Verified that operators and crews coordinate for maintenance support for maintenance faults that they could not correct.	—	—
16. Inspected operator and crew maintenance procedures. Verified that maintenance was conducted within guidelines of applicable environmental laws, regulations, and procedures.	—	—
17. Verified that follow up checks on deferred maintenance and parts orders were being performed. Ensured that ordered parts were being installed promptly.	—	—
18. Verified that assigned equipment receives periodic services as scheduled.	—	—
19. Established and maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all steps are passed. Score the Soldier NO-GO if any steps are failed. If the Soldier scores NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 2404
- DA FORM 5987-E
- DA FORM 5988-E
- DA PAM 750-8
- DD FORM 1970

**Related**

Subject Area 15: CONTROLLING CLASS III AND PIPELINE OPERATIONS

**Determine Throughput Requirements for the Petroleum Pipeline**

**101-92F-4260**

**Conditions:** Given the requirement to determine throughput requirements for an Inland Petroleum Distribution System (IPDS) in a field environment. The Soldier (assigned to a Petroleum Battalion Operation Branch) must determine throughput requirements for the petroleum pipeline, ensuring each terminal in the system is provided required operational stocks. Materials required: operations orders (OPORD) or Fragmentary Orders (FRAGOs), information concerning specific petroleum requirements, amount of products on hand, storage capacities of each terminal, standing operating procedure (SOP), communication equipment, and full access to all reference materials.

**Standards:** Determine throughput requirements for the petroleum pipeline, ensuring each terminal in the system is provided required operational stocks.

**Performance Steps**

1. Obtain OPORD or FRAGOs of the given task and current operational situation or operation tempo.
2. Obtain each terminal's throughput requirements from the monthly consumption graph and daily pumping order.
3. Analyze requirements and capabilities to determine if available assets can support mission or task.
4. Check each terminal's on-hand balances for accuracy.
5. Check each terminal's issues for accuracy.
6. Check, by type, the amount of product received for the period by each terminal.
7. Check, by type, the amount of product issued for the period by each terminal.
8. Check, by type, the amount of product on hand at each terminal.
9. Reconcile the above figures to ensure each terminal will be able to meet the required throughput figures.
10. Prepare OPORD for pumping operations.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Obtained OPORD or FRAGOs of the given task and current operational situation or operation tempo.	—	—
2. Obtained each terminal's throughput requirements from the monthly consumption graph and daily pumping order.	—	—
3. Analyzed requirements and capabilities to determine if available assets can support mission or task.	—	—
4. Checked each terminal's on-hand balances for accuracy.	—	—
5. Checked each terminal's issues for accuracy.	—	—
6. Checked, by type, the amount of product received for the period by each terminal.	—	—

**Performance Measures**

	<u>GO</u>	<u>NO-GO</u>
7. Checked, by type, the amount of product issued for the period by each terminal.	—	—
8. Checked, by type, the amount of product on hand at each terminal.	—	—
9. Reconciled the above figures to ensure each terminal will be able to meet the required throughput figures.	—	—
10. Prepared OPORD for pumping operations.	—	—

**Evaluation Guidance:** Score the Soldier GO if all steps are passed. Score the Soldier NO-GO if any steps are failed. If the Soldier scores NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**  
FM 10-67-1

**Related**  
DA PAM 750-8

## Perform the Duties of the Shift Dispatcher of the Pipeline Distribution System

101-92F-4275

**Conditions:** Given the requirement to run dispatch operations for an Inland Petroleum Distribution System (IPDS) in a field environment. Personnel and materials required to perform the task: nine military occupational specialty (MOS)-qualified (92F) Soldiers; an operational petroleum pipeline, fuel source, operational data/records, storage tank capacities and strapping charts for each terminal, number and location of pump stations, line fills, graph paper, slope table with parallel rule, assorted colored pencils, communications system, unit standing operating procedure (SOP) on pipeline operations, and full access to reference materials.

**Standards:** Perform the duties of the shift dispatcher of the pipeline distribution system, ensuring timely dispatch of products into the line to meet the command's product movement requirements.

### Performance Steps

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Integrate risk management into planning and preparing for operations and training activities.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance.
2. Maintain and familiarize with applicable reference materials.
  - a. Unit SOP.
  - b. Operations order (OPORD) and Concept of Support.
  - c. Local ordinances, environmental laws, and policies.
  - d. Pipeline trace(s).
  - e. Host Nation Support (HNS) agreement (if overseas).
3. Ensure communication equipment is on hand and mission capable.
4. Ensure required personnel and equipment to accomplish task are available and mission capable.
  - a. Identify implied and specific requirements from OPORD.
  - b. Analyze requirements and capabilities.
    - (1) Calculate available storage facilities (fixed or mobile).
    - (2) Calculate amount of time required for movement of product through pipeline to specified destinations.
  - c. Identify personnel, equipment, and supplies to maintain operations on a 24-hour basis.
5. Project maintenance and supply replenishment.
  - a. Maintenance requirements for terminal, pump, and pipeline components.
  - b. Pipeline and pumping schedules in support of petroleum supply requirement.
  - c. Identify equipment maintenance support activity.
  - d. Ensure spare parts or system components are on hand.
  - e. Establish reorder procedures for repair parts or equipment that are beyond repair.
6. Prepare a consumption graph for each product at each terminal as follows:
  - a. Prepare a graph sheet with thousands of barrels on vertical axis and days of month on horizontal axis (a day being calculated from 0001 of one day to 0001 of the next).
  - b. Show an allowance for vapor space of 5 percent of total storage capacity. Designate this by making spaced slashes through areas of graph designated for vapor space.
  - c. Show theater determined safety level in the same way at bottom of chart.

**Performance Steps**

- d. Plot calculated issues and receipts using a broken line. Plot actual issues and receipts using a solid line. All receipts are shown by a vertical line plotted at the end of the day. Daily issues to local customers and pipeline issues are shown on the same graph.
  - e. Show reduced storage capacity for tank cleaning and repairs.
7. Schedule dispatch of products into pipeline based on consumption graph.
  8. Direct batching sequence of products into pipeline.
  9. Prepare monthly pipeline schedule as follows:
    - a. Prepare a graph with vertical axis representing total line fill for system in thousands of barrels and horizontal axis representing working hours per day.
    - b. Represent terminals on vertical axis at their respective line fill distance.
    - c. Graph location and movement of each batch through pipeline. Label each batch by product and batch number. Graph each batch with a different color pencil.
    - d. Show pipeline shutdown by graphing a dotted line along vertical axis for portion of pipeline to be shut down and a dotted line along horizontal axis during time it is to be shut down.
    - e. Show stripping of product from a terminal in the same manner. Note in block formed by lines that stripping is taking place.
  10. Prepare daily pumping schedule. As a minimum, pumping schedule describes batches moving in and out of terminals on pipeline, time in and out of each terminal, and any other special instructions required to operate pump stations along pipeline.
  11. Keep records of hourly reports received from pump stations, tank farms, dispensing stations, and other installations; fuel receipts into pipeline system; fuel delivered to installations along line; fuel left in system; and fuel lost.
  12. Render status reports and other reports to chain of command as required by unit SOP.
  13. Establish and maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Maintained and familiarized with applicable reference materials.	—	—
3. Ensured communication equipment is on hand and mission capable.	—	—
4. Ensured required personnel and equipment to accomplish task are available and mission capable.	—	—
5. Verified that maintenance and supply replenishment are projected.	—	—
6. Prepared a consumption graph for each product at each terminal.	—	—
7. Scheduled dispatch of products into the pipeline based on the consumption graph.	—	—
8. Directed batching sequence of products into pipeline.	—	—
9. Prepared monthly pipeline schedule.	—	—
10. Prepared daily pumping schedule.	—	—

<b>Performance Measures</b>	<u>GO</u>	<u>NO-GO</u>
11. Kept records of hourly reports received from pump stations, tank farms, dispensing stations, and other installations; fuel receipts into the pipeline system; fuel delivered to installations along the line; fuel left in the system; and fuel lost.	—	—
12. Rendered status reports and other reports to chain of command as required by unit SOP.	—	—
13. Established and maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

DOD 4140.25-M  
FM 10-67-1

**Related**

DA PAM 200-1  
FM 100-14  
FM 10-416  
FM 10-67-2  
FM 3-100.12  
FM 5-482  
MIL-HDBK-1022A



## Manage Installation of Petroleum Pipeline Sections

**101-92F-4310**

**Conditions:** Given the requirement to control the installation and maintenance of an operational Inland Petroleum Distribution System (IPDS) system in a field environment. Personnel and materials required to perform task: eight military occupational specialty (MOS)-qualified (92F) Soldiers; pre-selected pipeline/hose line trace, communication system, risk management procedures, applicable Material Safety Data Sheets (MSDS), Facility Response Plan (FRP), and Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required), daily pumping order, unit standing operating procedure (SOP), and full access to all reference materials.

**Standards:** Monitor the installation and maintenance of the petroleum pipeline, ensuring the pipe is properly installed and maintained to provide petroleum support from the communications zone (COMMZ) as far into the combat zone (CZ) as tactical situation permits.

### Performance Steps

#### WARNING

**A constant fire and hazards explosion exists on a pipeline because of the fuels. Repair teams should use an explosimeter to determine how explosive and toxic an area is before entering it. When disconnecting a pipeline to replace damaged pipe or fittings or when a line break occurs, immediately shutdown the line and close the closest block valves on each side of the break to capture as much of the fuel as possible before it becomes a fire hazard. Every opening could be a potential fire. Fire-fighting troops should accompany repair crews on major repair assignments.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Integrate risk management into planning and preparing for operations and training activities.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance.
2. Maintain and familiarize with applicable reference materials.
  - a. Unit SOP.
  - b. Operations order (OPORD) and Concept of Support.
  - c. Local ordinances, laws, and policies.
  - d. Local environmental policies and procedures on hazardous waste/hazardous material (HW/HM) management.
3. Ensure communication equipment is on hand and mission capable.
4. Ensure required personnel and equipment to accomplish task are available and mission capable.
5. Verify that maintenance and supply replenishment are projected.
  - a. Identify engineer support for construction of additional facilities or repair of existing facilities.
  - b. Maintenance requirements for terminal, pump, and pipeline components.

**Performance Steps**

- c. Ensure spare parts or system components are on hand.
- d. Establish reorder procedures for repair parts or equipment that are beyond repair.
- 6. Publish fire regulations.
- 7. Verify that personnel are briefed on safety and environmental hazards prior to beginning operations.
- 8. Coordinate with product control section for daily pumping order, 24 hours in advance of operations.
- 9. Establish work schedules and assign duties.
- 10. Issue daily pumping orders to subordinates.
- 11. Maintain operating directives.
- 12. Monitor communications for communications security (COMSEC) discipline.
- 13. Coordinate with service support section for ground maintenance.
- 14. Coordinate patrolling of pipeline with section leaders.
- 15. Maintain quality surveillance.
- 16. Monitor pipeline repairs.
  - a. Ensure that pipeline replacement parts and equipment are on hand to repair pipeline.
  - b. Coordinate shutdown of pipeline to install new sections of pipeline or for replacement of valves.
  - c. Verify pipeline sections are evacuated in an environmentally safe manner and that waste fuel is disposed of properly in accordance with applicable environmental laws and regulations.
  - d. Enforce safety procedures.
  - e. Verify proper testing procedures are conducted on pipeline in according to unit tactical standing operating procedure (TSOP).
- 17. Monitor operations for safety and environmental infractions.
  - a. Ensure appropriate personal protective equipment (PPE) is worn.
  - b. Shut down operations immediately if any violations occur and correct them.
  - c. Report spills as required by applicable environmental laws, policies, and regulations.
- 18. Coordinate restart of pipeline operations with operations section.
- 19. Establish and maintain records and reports according to unit SOP.
  - a. Accountability and Inventory.
  - b. Petroleum Quality Maintenance.
  - c. Other incident or event that require recording and reporting.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Maintained and familiarized with applicable reference materials.	—	—
3. Ensured communication equipment is on hand and mission capable.	—	—
4. Ensured required personnel and equipment to accomplish task are available and mission capable.	—	—
5. Verified that maintenance and supply replenishment are projected.	—	—
6. Published fire regulations.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
7. Verified that personnel are briefed on safety and environmental hazards prior to beginning operations.	—	—
8. Coordinated with product control section for daily pumping order, 24 hours in advance of operations.	—	—
9. Established work schedules and assigns duties.	—	—
10. Issued daily pumping orders to subordinates.	—	—
11. Maintained operating directives.	—	—
12. Monitored communications for communications security (COMSEC) discipline.	—	—
13. Coordinated with service support section for ground maintenance.	—	—
14. Coordinated patrolling of pipeline with section leaders.	—	—
15. Maintained quality surveillance.	—	—
16. Monitored pipeline repairs.	—	—
17. Monitored operations for safety and environmental infractions.	—	—
18. Coordinated restart of pipeline operations with operations section.	—	—
19. Established and maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**  
 FM 10-67-1  
 FM 5-482

**Related**  
 DA PAM 750-8  
 FM 3-100.12  
 FM 3-100.4

**Control Class III Supply Point Operations****101-92F-4316**

**Conditions:** Given the requirement to receive, store, and issue bulk petroleum at a Class III supply point in a field environment. Personnel and materials required to perform task: military occupational specialty (MOS)-qualified 92F and 92L Soldiers (51 total); Fuel System Supply Point (FSSP) system, Advanced Aviation Forward Area Refueling System (AAFARS) system, trucks to haul equipment, fuel source, fire extinguishers, communication equipment, spill kit/containment and cleanup equipment, Facility Response Plan (FRP), Oil Discharge Contingency Plan (ODCP) (if required), Spill Prevention Control and Countermeasures (SPCC) plan, the unit hazardous waste/hazardous material (HW/HM) management policy, an oral or written operations order (OPORD), risk management procedures, appropriate Material Safety Data Sheets (MSDS), personal protective equipment (PPE), unit standing operating procedure (SOP) on fuel support operations, DD Form 1970 (Motor Equipment Utilization Record) or DA Form 5987-E (Motor Equipment Dispatch (EGA)), DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection Maintenance Worksheet (EGA)), and full access to applicable reference materials.

**Standards:** Control a Class III supply point safely to receive, store, and issue; account for petroleum products, personnel and equipment; implement quality surveillance and petroleum stewardship with minimal damage to environment or damage to equipment or personal injury.

**Performance Steps****DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Integrate risk management into planning and preparing for operations and training activities.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance.
2. Maintain and familiarize with applicable reference materials.
  - a. Operation Order (OPORD).
  - b. Standing Operating Procedure (SOP) .
  - c. Communication Single Operating Instruction (CSOI).
  - d. Material Safety Data Sheet (MSDS).
  - e. Other appropriate field manuals (FMs), technical manuals (TMs), publications, forms, and reports.
3. Ensure communication equipment is on hand and mission capable.
4. Ensure required personnel and equipment to accomplish task are available and mission capable.
5. Verify that maintenance and supply replenishment are projected.
  - a. Identify maintenance support activity.
  - b. Identify requirements and capabilities.

**Performance Steps**

6. Coordinate reconnaissance for the selected area for class III Supply Point.
  - a. Coordinate with S2 for detail information on area assigned.
  - b. Conduct map and/or site recon within the area selected.
  - c. Prepare detail sites lay out plans.
7. Select a site for Class III supply point within area assigned based on the following criteria:
  - a. Choose an area as close to supported units as dispersion factors, sources of supply, and the tactical situation permit.
  - b. Use vacated forward sites or existing facilities when you can.
  - c. Choose a level and well drained site as possible. Avoid low areas where vapors may collect.
  - d. Choose a site as far away from waterways and power lines as possible. Never choose one uphill or upstream from other units.
  - e. Select a site with adequate cover and concealment.
  - f. Select a site large enough to meet the needs of product supply and distribution plans, but not so large that handling operations and area security become inefficient.
  - g. Provide for at least two storage areas with balanced stocks in each.
  - h. Choose a site with easy access to road nets, but not near important communications and population centers that may be enemy targets.
  - i. Allow for possible site expansion.
8. Coordinate with supporting engineers if such support is available and needed.
9. Develop a flow plan for the site based on flow of product through the various areas of the site and the flow of traffic through the site. Identify steps which can be eliminated, combined, or changed to make the operation more efficient.
10. Develop a load plans based on the mission, type of transport to be used, the number of personnel involved, and the type, size, weight, and quantity of supplies and equipment to be moved.
11. Determine the best method for moving the Class III Supply Point site (whole system or leap frog method) and move the site without interruption of fuel support.
12. Verify that the Class III supply point is set up, operated, and dismantled according to the mission, OPORD and unit SOP or SOP.
13. Verify that site security is established/maintained and a pilferage control program implemented.
14. Verify that quality control and accountability of petroleum products are maintain in accordance with appropriate reference materials and unit SOP.
15. Verify compliance of petroleum fire and safety program.
  - a. Ensure that signs identifying no smoking areas and other dangerous areas throughout the supply point are identified.
  - b. Ensure the speed control and other traffic control signs are posted in the area.
16. Verify that a petroleum environmental stewardship program is conducted.
17. Verify that unit maintenance is conducted to all vehicles and equipment.
18. Collect, consolidate, prepare, maintain, and submit reports that are required by higher HQ or agency in accordance with unit SOP and appropriate reference materials.
19. Establish and maintain records and reports according to unit SOP.
  - a. Accountability and Inventory.
  - b. Petroleum Quality Maintenance.
  - c. Other incident or event that require recording and reporting.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Maintained and familiarized with applicable reference materials.	—	—
3. Ensured communication equipment is on hand and mission capable.	—	—
4. Ensured required personnel and equipment to accomplish task are available and mission capable.	—	—
5. Verified that maintenance and supply replenishment are projected.	—	—
6. Coordinated reconnaissance for the selected area for Class III Supply Point.	—	—
7. Selected a site for the Class III supply point within the area assigned for setup.	—	—
8. Coordinated with supporting engineers if such support is available and needed.	—	—
9. Developed a flow plan for the site based on flow of product through the various areas of the site and the flow of traffic through the site. Identified steps which can be eliminated, combined, or changed to make the operation more efficient.	—	—
10. Developed a load plan based on the mission, type of transport to be used, the number of persons involved, and the type, size, weight, and quantity of supplies and equipment to be moved.	—	—
11. Determined the best method for moving the Class III Supply Point site (whole system or leap frog) and moved the site without interruption of fuel support.	—	—
12. Verified that the Class III supply point is set up, operated, and dismantled in accordance with OPORD, and unit SOP or TSOP.	—	—
13. Verified that site security is established/maintained and a pilferage control program is implemented.	—	—
14. Verified that quality control and accountability of petroleum products were maintained in accordance with appropriate reference materials and unit SOP or TSOP.	—	—
15. Verified compliance of petroleum fire and safety program.	—	—
16. Verified that a petroleum environmental stewardship program is conducted.	—	—
17. Verified that unit maintenance is conducted to all vehicles and equipment.	—	—
18. Collected, consolidated, prepared, maintained, and submitted reports that are required higher HQ or agency in accordance with unit SOP, TSOP, and appropriate reference materials.	—	—
19. Established and maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measures are failed. If the Soldier scores a NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

DA FORM 2404  
DA FORM 5987-E  
DA FORM 5988-E  
DD FORM 1970  
FM 100-14  
FM 10-67-1

**Related**

DA PAM 710-2-1  
DA PAM 750-8  
FM 10-426  
FM 3-100.12  
FM 3-100.4  
FM 5-482  
TC 3-34.489  
TM 10-3835-219-14  
TM 10-4320-343-14  
TM 10-4930-232-12&P  
TM 5-4310-452-14  
TM 5-4930-237-10  
TM 9-2320-279-10-1

## Manage Tactical Petroleum Terminal (TPT) Operations

101-92F-4400

**Conditions:** Given the requirement to control bulk petroleum products in a Tactical Petroleum Terminal (TPT) system in a field environment. Personnel and materials required to perform task: fifty-one military occupational specialty (MOS)-qualified (92F) Soldiers; transport equipment and primary components of TPT, which consist of three fuel units, Tank Farm Assemblies with two 5,000 barrel (bbl) fabric tanks each), a Tanker Truck Receipt Manifold, a Fuel Dispensing Assembly, a Transfer Hoseline Assembly, six Fire Suppression Assemblies, an Optional Tank Configuration and a Fuel Unit Support Assembly, petroleum products, communications equipment, risk management procedures, Material Safety Data Sheets (MSDS), personal protective equipment (PPE), communication equipment, fire extinguishers, spill kits/containment and clean up equipment, Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan, Oil Discharge Contingency Plan (ODCP) (if required), oral or written operations order (OPORD), unit standing operating procedure (SOP) on TPT operations, daily pumping order, DA Form 2765-1 (Request for Issue or Turn-in), DA Form 3643 (Daily Issues of Petroleum Products), DA Form 3644 (Monthly Abstract of Issues of Petroleum Products and Operating Supplies), DA Form 3857 (Commercial Deliveries of Bulk Petroleum Products Checklist), DA Form 4193 (Petroleum Products Pump Station Hourly Operations Record), DA Form 4786 (Petroleum Products - Tank Farm Intake Record), DA Form 5464-R (Petroleum Products Pipeline Leakage Report), DD Form 250 (Materiel Inspection and Receiving Report), DD Form 250-1 (Tanker/Barge Materiel Inspection and Receiving Report), and full access to all reference material.

**Standards:** Control bulk petroleum products in a TPT, receive, store, and issue products to support the force without damage to equipment, injury to personnel, or pollution of the environment.

### Performance Steps

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Integrate risk management into planning and preparing for operations and training activities.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance.
2. Maintain and familiarize with applicable reference materials.
  - a. OPORD.
  - b. SOP or tactical standing operating procedure (TSOP).
  - c. Communication equipment operating instructions and procedures.
  - d. MSDS.
  - e. Other appropriate field manuals (FMs), technical manuals (TMs), publications, forms, and reports.
3. Ensure communication equipment is on hand and mission capable.
4. Ensure required personnel and equipment to accomplish task are available and mission capable.
5. Verify that maintenance and supply replenishment are projected.
  - a. Identify maintenance support activity.
  - b. Identify engineer support for construction of additional facilities or repair of existing facilities.
  - c. Identify requirements and capabilities.
  - d. Maintenance requirements for terminal, pumps, and pipelines.



## Performance Steps

6. Conduct a reconnaissance of the selected site check the following areas:
  - a. Inspect site for proper drainage to prevent water damage.
  - b. Inspect site for adherence to limit of 1.5 percent slope allowance to prevent tanks from rolling toward the low side of terrain.
  - c. Inspect positioning of pump stations, collapsible fabric tanks, fuel tank assemblies, and hose line distribution assemblies for prescribed distances between components
  - d. Inspect site selection for access to road nets.
  
7. Control installations of Tactical Petroleum Terminal.
  - a. Coordinate site preparation and earth work.
    - (1) Ensure site is graded to meet drainage and slop requirements
    - (2) Verify that all sharp objects that could damage fabric tanks are removed from prepared site.
    - (3) Direct construction of wooden supports to relieve stress on elbow of fabric tanks.
    - (4) Direct digging of trenches and fire walls to protect storage locations.
  - b. Provide layout plan to section chiefs and designate responsibilities for each.
  - c. Provide technical assistance/guidance to section personnel.
  - d. Coordinate with naval personnel for emplacement of ship-to-shore interface system with beach termination unit (BTU).
  
8. Conduct briefing and ensure personnel are knowledgeable on Concept of Operation in accordance with OPORD, unit SOP, and specific guidelines that pertains to task or mission.
  - a. Ensure personnel understand mission or task at hand.
    - (1) Individual tasks or specific role of every personnel to accomplish mission.
    - (2) Collective tasks that a group needs to perform to support mission.
  - b. Explain degree of risks involved that personnel needs to be aware of.
  - c. Stress safety for personnel to incorporate throughout operations.
  - d. Spill prevention and control measures.
  - e. Hazardous waste/hazardous material (HW/HM) management and environmental hazards.
  - f. Discuss specific guideline that pertains to Tactical Petroleum Terminal.
    - (1) Orientation of site.
    - (2) General operating rules for receiving, issuing, intraterminal transfer, records and reports.
    - (3) Transfer procedures to and from pipeline. Specifically procedures for handling product interface.
    - (4) Tank-Truck receipt manifold procedures.
    - (5) Fuel Dispensing procedures.
    - (6) Communication procedures.
    - (7) Maintaining records for accountability of product and pump operations.
    - (8) Fire drills.
  
9. Conduct final inspection prior to operation.

NOTE: It is important to make a final inspection using a checklist arranged essentially in the order of this installation procedure. This should be done by supervisory and management personnel from both the installation and operating groups. The following inspection points should be emphasized:

- a. Integrity and height of tank berms - closed berm drain valve.
- b. Floodlight location, operability, and grounding.
- c. Fabric collapsible tank layout and connections.
- d. Pump location, operability, servicing, and grounding.
- e. Meter-strainer flow direction and grounding.
- f. Filter separator flow direction, test adapter installation, and grounding.
- g. Hose line, valves, and fittings couplings closed, flanges tight, valve packing glands tight, valves in operable position and closed. No sharp bends, proper lay on tank tops, sandbags on free ends and bends subject to whip, and the general condition of the hose line.
- h. Sampling assembly in operable location, joints tight, valves closed, and grounding.
- i. Fire suppression equipment charged, ready to operate, and in proper location.

**Performance Steps**

- j. SAFETY and NO SMOKING signs readable and in proper location.
  - k. Review pressure test results and evidence of corrective action.
  - l. Road crossing protection (culverts and suspension devices) in place where needed.
  - m. Range poles installed properly with cross cord at correct height.
  - n. Corrective painting complete.
  - o. Equipment identification marking correct and adequate.
  - p. Portable fuel testing kit intact.
  - q. Cleanup of area adequate.
10. Control TPT operations.
- a. Coordinate with product control section for daily pumping and local delivery schedules.
  - b. Issue daily pumping and delivery orders to section personnel.
  - c. Prepares shift schedules to operate facilities on a 24-hour basis.
  - d. Conduct fire drills.
  - e. Brief incoming shift supervisor on terminal status.
  - f. Inspect terminal operation site for compliance with safety directives.
  - g. Report pipeline breaks, leakage, fire, or other interruptions to petroleum product control section/District dispatch office.
  - h. Inspect communications equipment and maintenance logs to ensure equipment is operational at all times.
  - i. Monitor stored theater reserve stock for compliance with petroleum support operations plan and quality surveillance program.
  - j. Coordinate repair of unserviceable items with maintenance section or service support section.
  - k. Performs routine tests on products in storage and incoming and outgoing products, using petroleum testing kit.
  - l. Coordinate with higher HQ petroleum testing lab for additional testing of questionable products.
  - m. Maintain records and reports. Ensure that quality control and accountability of petroleum products are maintained.
  - n. Inspect daily operational records for compliance with petroleum support requirement.
  - o. Identify corrective actions when deficiencies are noted.
  - p. Schedule transportation of product to serviced units.
11. Ensure that a petroleum fire and safety program is conducted according to task 101-92F-4311.
- a. Signs identifying NO SMOKING areas and other dangerous areas throughout the tactical petroleum terminal are identified.
  - b. Speed control and other traffic control signs are posted in the area.
12. Ensure that a petroleum environmental stewardship program is conducted according to task 101-92F-4281.
13. Ensure that unit maintenance is conducted according to task 101-92F-4313.
14. Establish quality surveillance procedures according to task 101-92F-4261.
15. Collect and forward required unit status reports to higher HQ product control section daily.
16. Establish and maintain records and reports according to unit SOP.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Maintained and familiarized with applicable reference materials.	—	—
3. Ensured communication equipment is on hand and mission capable.	—	—
4. Ensured required personnel and equipment to accomplish task are available and mission capable.	—	—
5. Verified that maintenance and supply replenishment are projected.	—	—
6. Conducted a reconnaissance of the selected site.	—	—
7. Controlled installations of Tactical Petroleum Terminal.	—	—
8. Conducted briefing and ensure personnel were knowledgeable on Concept of Operation in accordance with OPOD, unit SOP, and specific guidelines that pertains to task or mission.	—	—
9. Conducted final inspection prior to operation.	—	—
10. Controlled TPT operations.	—	—
11. Ensured that a petroleum fire and safety program is conducted according to task 101-92F-4311.	—	—
12. Ensured that a petroleum environmental stewardship program is conducted according to task 101-92F-4281.	—	—
13. Ensured that unit maintenance is conducted according to task 101-92F-4313.	—	—
14. Established quality surveillance procedures according to task 101-92F-4261.	—	—
15. Collected and forward required unit status reports to higher HQ product control section daily.	—	—
16. Established and maintained records and reports according to unit SOP.	—	—

**Evaluation Guidance:** Score the Soldier GO if all steps are passed. Score the Soldier a NO GO if any steps are failed. If the Soldier scores as NO GO show what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 2765-1
- DA FORM 3643
- DA FORM 3644
- DA FORM 3857
- DA FORM 4193
- DA FORM 4786
- DA FORM 5464-R
- DA PAM 710-2-2
- DD FORM 250
- DD FORM 250-1
- DOD 4140.25-M
- FM 10-67-1
- MIL-HDBK-1022A

**Related**

- DA PAM 750-8
- FM 3-100.12
- FM 3-100.4
- TM 5-3835-220-13&P

Skill Level 5

Subject Area 16: EVALUATING GENERAL PETROLEUM SUBJECTS AND TANK VEHICLES

**Evaluate the Petroleum Environment Stewardship Protection Program**

**101-92F-5201**

**Conditions:** Given the requirement to evaluate an environmental stewardship program in a field environment. Materials required to perform task: an environmental stewardship inspection checklist, a petroleum unit to inspect, paper, pencil, Facility Response Plan (FRP), Spill Prevention Control and Countermeasures (SPCC) plan; Oil Discharge Contingency Plan (ODCP) (if required), Material Safety Data Sheets (MSDS), Hazardous Material Information Sheets (HMIS), unit standing operating procedure (SOP), the installation environmental SOP, personal protective equipment (PPE), and full access to all reference materials.

**Standards:** Conduct an environmental stewardship compliance inspection according to local unit policies for inspection programs and the performance measures of this task. Maintain applicable MSDS.

**Performance Steps**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Implement risk controls by coordinating and integrating them into the appropriate paragraphs and graphics of the operations order (OPORD) and into products such as SOP, operations plan (OPLAN), and training plans.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance.
2. Verify applicable MSDS are maintained.
3. Enforce wearing of appropriate PPE as required.
4. Evaluated units on environmental stewardship based on the schedule established by local headquarters.
5. Evaluated unit management of the environmental stewardship program. Verify the following:
  - a. An environmental compliance officer or hazardous waste (HW) coordinator is appointed.
  - b. The environmental compliance officer or HW coordinator is trained within 30 days of being assigned to duty.
  - c. The unit conducts an environmental training program.
  - d. That unit personnel are trained in environmental awareness.
  - e. The unit SOP covers unit spill prevention and response.
  - f. The unit SOP covers the hazardous communications (HAZCOM) program.
  - g. The unit has a pollution prevention/Hazardous Waste Minimization (HAZMIN) program.
  - h. The unit has a re-cycling program.
  - i. The unit maintains high cleanliness standards in petroleum, oils, and lubricants (POL), hazardous material, and HW storage areas.
  - j. The unit minimizes detailed maintenance in the field.
  - k. Waste storage areas are inspected weekly. Inspection is documented and records are maintained for three years.
  - l. Uniform HW manifests are properly filled out, signed by trained personnel, tracked, and maintained properly either at unit or installation level.

## Performance Steps

6. Evaluate waste oil storage areas. Verify the following:
  - a. POL storage areas have adequate dikes or catchments.
  - b. Waste oil and other possible pollutants are stored in authorized containers and are properly labeled.
  - c. Waste oil tanks are pumped out when full.
  
7. Evaluate hazardous material (HM)/HW handling. Verify the following:
  - a. Only the amount of HM needed is ordered.
  - b. The unit HM/HW inventory is up to date, and no HW remains on site longer than regulatory deadlines.
  - c. Hazardous waste is collected and stored in authorized containers.
  - d. The HM/HW is disposed of according to directives.
  - e. Containers are labeled according to directives.
  - f. Containers are in good condition and closed tightly at all times except when adding materials.
  - g. Each container is marked with accumulation start dates.
  - h. Accumulation tanks used for collecting HW and other pollutants (antifreeze, GAA, oil) are properly marked. Waste is segregated by type and storage procedures are adhered to.
  - i. Danger and warning signs are conspicuously placed.
  - j. Spill prevention and control equipment is adequate.
  - k. Personnel are trained in the proper handling, collection, storage, and transportation of HM/HW.
  - l. Used POL cans and drums are being disposed of properly according to applicable environmental regulations.
  - m. Asbestos containing parts (brake shoes, clutch plated, and equipment (Insulation) are being removed, collected, and disposed of properly.
  
8. Evaluate solid waste management. Verify the following:
  - a. Procedures to reduce production of waste are enforced.
  - b. Product separation and re cycling efforts are in effect.
  - c. Source reduction practices are enforced.
  - d. The unit is requesting supplies only as needed (no stockpiling).
  - e. Water, soap, kitchen grease, or garbage is never discharged into the street, storm drainage system, or groundwater source.
  
9. Evaluate spill prevention. Verify the following:
  - a. Oil, fuel, or other hazardous pollutant spills (over 5 gallons in volume or 100 square feet in area), or any detectable amount onto water are reported immediately according to local SOP.
  - b. Creek/drainage channels are free of pollution.
  - c. Pollutants are never discharged into storm or wash rack drains or poured on the ground or along fence lines (common pollutants are oil, solvent, soap, diesel, gasoline, battery acid, chemicals waste, antifreeze, paint, and grease).
  - d. Small oil spills are cleaned in a timely manner.
  - e. Drip pans are used under vehicles/equipment and POL product barrels, wherever spills are likely to occur.
  - f. Contaminated soil is properly disposed of (soil is taken to a designated authorized disposal area).
  
10. Evaluate the recycling program. Verify the following:
  - a. All materials (solvents, antifreeze, used oil) are being re cycled according to directives.
  - b. The unit is delivering material to the installation re cycling center.
  - c. Recyclable materials sources are separated (that is, are there separate collection containers for paper, aluminum, and other items).
  - d. the unit recycles the following materials:
    - (1) Computer printouts.
    - (2) Computer punch cards.
    - (3) High grade paper.

**Performance Steps**

- (4) Corrugated cardboard.
  - (5) Newspaper.
  - (6) Aluminum cans
  - (7) Steel cans.
  - (8) Glass.
  - e. Dumpsters are free of recyclable items.
  - f. Used cleaning solvents are being recycled/collected properly.
11. Evaluate unit wash rack operations. Verify the following:
- a. Vehicles and equipment are washed only in authorized wash racks.
  - b. Steam cleaning equipment is used only in an authorized wash rack.
  - c. Wash racks and vicinity are free of contaminated soil, sand, or silt.
  - d. Solvents or soap is not used.
  - e. Metal gratings or baffles at the wash rack oil interceptor, catch basins, or floor drains are present and serviceable.
  - f. Wash rack area is free of oil and/or fuel spills.
  - g. Treatment devices (oil and grease interceptors, catch basins, collection ponds, drains, tanks) are properly maintained and serviced.
  - h. The wash rack area is free of oil, rags, and trash.
  - i. Faucets and/or back flow preventors are in good operating condition.
  - j. Only authorized soap, solvent, or chemicals are used with steam cleaning equipment.
  - k. The oil/water separator is in good working condition.
  - l. Vehicle/equipment/aircraft wastewater discharge is tied into a treatment system.
12. Evaluate land management. Verify the following:
- a. Vehicles are parked or driven only in authorized areas.
  - b. Surface areas and curbs are free of vehicular damage.
  - c. Vehicle parking areas are free of litter.
  - d. Gravel is used only in authorized areas and in an authorized manner.
  - e. Archeological or historical sites are safeguarded.
  - f. Live or dead trees or limbs are felled, removed, or used only with approval from range control/forester.
  - g. Unit personnel know the correct procedures for disposing of garbage, refuse, and rubbish in range areas.
  - h. Storm water ditches in the vicinity of motor pools are free of POL or other HM/HW.
  - i. Detention ponds, waste and sump collection points, and vehicle inspection points are functional and being serviced properly.
  - j. Paint spray, battery, and radiation repair operations are operated properly and coordinated with the environmental management officer, and safety and preventive medicine officers.
  - k. Collection points are established with proper containers and servicing for all maintenance generated wastes.
  - l. The unit follows procedures for fording streams which prevent environmental damage and uses only operational fording areas.
  - m. The unit follows local range procedures for digging and covering fighting positions in the local range area.
  - n. The unit uses only authorized refueling points in the garrison and in the field.
  - o. The unit's refueling operation SOP addresses practices to minimize spills.
  - p. The unit has on hand material to clean up spills (spill kits).
  - q. Fuel handlers know how to report a spill.
13. Evaluate fire and safety program according to local policy.
14. Prepare a written report of the evaluation as required by local unit procedures. Recommend corrective actions for any shortcomings discovered.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Verified applicable MSDS are maintained.	—	—
3. Enforced wearing of appropriate PPE as required.	—	—
4. Evaluated units on environmental stewardship based on the schedule established by local headquarters.	—	—
5. Evaluated unit management of the environmental stewardship program.	—	—
6. Evaluated waste oil storage areas.	—	—
7. Evaluated hazardous material (HM)/HW handling.	—	—
8. Evaluated solid waste management.	—	—
9. Evaluated spill prevention.	—	—
10. Evaluated the re cycling program	—	—
11. Evaluated unit wash rack operations.	—	—
12. Evaluated land management.	—	—
13. Evaluated fire and safety program according to local policy.	—	—
14. Prepared a written report of the evaluation as required by local unit procedures. Recommended corrective actions for any shortcomings discovered.	—	—

**Evaluation Guidance:** Score the Soldier GO if all steps are passed. Score the Soldier NO-GO if any steps are failed. If the Soldier scores NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**  
 FM 100-14  
 FM 10-67-1  
 FM 3-100.12  
 FM 3-100.4

**Related**  
 AMDF  
 TC 3-34.489

## Evaluate Accountability and Quality Surveillance

101-92F-5202

**Conditions:** Given the requirement to evaluate accountability and quality of petroleum products in a field environment. Personnel and materials required to perform task: two military occupational specialty (MOS)-qualified (92F) Soldiers; a unit using petroleum products, physical inventory management data, receipt and issue documents, pencil, paper, risk management procedures, unit standing operating procedure (SOP) covering the units inspection checklist, personal protective equipment (PPE), applicable Material Safety Data Sheets (MSDS), DA Form 3853-1 (Innage Gage and Sheet (Using Innage Tape and Bob)), DA Form 3643 (Daily Issues of Petroleum Products), DA Form 3644 (Monthly Abstract of Issues of Petroleum Products and Operating Supplies), DA Form 5138-R (Separation Action Control Sheet), DA Form 4702-R (Monthly Bulk Petroleum Accounting Summary) or DA Form 4702-R-E (Monthly Bulk Petroleum Accounting Summary (EGA)), and full access to all reference materials.

**Standards:** Conduct an evaluation of unit petroleum operations and report of findings which recommends corrective action for any shortcoming.

### Performance Steps

#### **DANGER**

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY  
RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR  
DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Implement risk controls by coordinating and integrating them into the appropriate paragraphs and graphics of the operations order (OPORD) and into products such as the unit tactical standing operating procedures (TSOPs), operations plans (OPLANs), and training plans.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance.
2. Coordinate with other services, local communities and Host Nation Support (HNS) (if overseas) for additional assets and requirements.
3. Maintain applicable MSDS.
4. Verify that appropriate PPE is worn.
5. Evaluate petroleum accountability and quality surveillance procedures on a schedule established by the local commander. As a minimum, evaluate the areas outlined in this task. Evaluate other areas of interest in accountability and quality surveillance procedures as established by the local commander.
6. Evaluate petroleum accountability. Verify the following:
  - a. US Government national credit cards are being used only when motor pool, DOD facilities, or plane contracts are not available.



**Performance Steps**

- b. AVFUEL identaplates are used only for purchasing product dispensed directly into using aircraft at Army airfields other than home stations, at Navy and Air Force installations, or from commercial vendors under Government contract. Ensure they are not used for purchasing products in advance and that all purchase receipts are turned in to the responsible officer.
  - c. A responsible individual is designated on orders to control bulk fuels, to provide an audit trail of all transactions (receipts and issues), and to perform seal custodian duties.
  - d. A DA Form 4702-R or DA Form 4702-R-E is used to maintain a record of receipts, issues, and inventory of petroleum products.
  - e. Daily transactions are posted on DA Form 3643.
  - f. Daily posting are consolidated on DA Form 3644.
  - g. A monthly bulk petroleum accounting summary is being prepared and is being submitted.
  - h. Losses of more than 25 gallons of fuel due to spillage or contamination is documented by the responsible individual and attached to MBPAS, DA Form 4702-R or DA Form 4702-R-E.
  - i. If auditable records during field exercises are not feasible, the unit commander completes a statement summarizing daily issues within 3 days after completion of the exercise.
  - j. Contaminated and used POL products are recovered, recycled, and disposed of according to applicable regulations and unit policies.
7. Evaluate inventory procedures. Verify that.
- a. All bulk rigid wall and collapsible wall tanks and containers are inventoried. Rigid wall tanks are physically gauged. Collapsible tanks are inventoried by reconciling the beginning inventory, issues, and receipts.
  - b. Bulk tanks that have receipts or issues are gauged and reconciled daily.
  - c. Bulk storage tanks that do not have receipts or issues are gauged weekly.
  - d. Monthly inventories are performed for each type and grade of bulk fuel in the unit.
  - e. Inventories are recorded on DA Form 3853-1 and documented on the MBPAS.
  - f. Quantities of fuel exceeding 3500 gallons are volume corrected to 60° F.
  - g. Inventories are reconciled using DA Form 5831-R or local equivalent.
  - h. A report of survey is initiated if losses exceed allowable losses and the value of the product is greater than \$500.
  - i. Causative research is initiated if the loss exceeds allowable losses and the value of the product is less than \$500.
  - j. Causative research is initiated if the gain exceeds the allowable gain.
8. Evaluate quality surveillance procedures. Verify that
- a. Sampling and gaging equipment and supplies are on hand and serviceable.
  - b. Samples are sent to the laboratory according to the schedule established by the MACOM SOP (overseas) or the schedule established by the USAPC in CONUS
  - c. Filter effectiveness samples are submitted to the laboratory every 30 days for equipment in operational use. If non-operational equipment becomes operational, a sample is performed then and every 30 days thereafter.
  - d. All fuels dispensed into end/consuming items are dispensed through a filter separator.
  - e. All filter separators are stenciled with the last date of filter change.
  - f. Petroleum storage tanks and dispensing vehicles are stenciled with the grade of fuel according to applicable policies and regulations.
9. Prepare a written report of the evaluation as required by unit policies noting any shortcomings found and recommending corrective actions.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Maintained applicable MSDS.	—	—
3. Coordinated with other services, local communities and Host Nation Support (HNS) (if overseas) for additional assets and requirements.	—	—
4. Verified that appropriate PPE was worn.	—	—
5. Evaluated petroleum accountability and quality surveillance procedures on a schedule established by the local commander.	—	—
6. Evaluated petroleum accountability.	—	—
7. Evaluated inventory procedures.	—	—
8. Evaluated quality surveillance procedures.	—	—
9. Prepared a written report of the evaluation as required by unit policies noting any shortcomings found and recommending corrective actions.	—	—

**Evaluation Guidance:** Score the Soldier GO if all steps are passed. Score the Soldier NO-GO if any steps are failed. If the Soldier scores NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

AR 710-2  
 DA FORM 3643  
 DA FORM 3644  
 DA FORM 3853-1  
 DA FORM 4702-R  
 DA FORM 4702-R-E  
 DA FORM 5138-R  
 FM 10-67-1  
 FM 3-100.4  
 FM 3-11

**Related**

DA PAM 710-2-1  
 DOD 4140.25-M  
 FM 10-67-2  
 FM 3-100.12  
 FM 3-100.21  
 MIL-HDBK-1022A  
 MIL-STD-3004A

## Plan Petroleum and Water Operations

101-92F-5203

**Conditions:** 'Given the requirement to plan petroleum and water operations in a field environment. Materials required: the requirement to develop a plan for petroleum and water distribution in a specific theater of operations, operations order (OPORD) giving appropriate planning information, unit standing operating procedure (SOP), risk management procedures, and full access to all reference materials.

**Standards:** Develop a petroleum and water distribution plan which effectively supports mission requirements for the projected duration of an operation and environment.

### Performance Steps

#### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Implement risk controls by coordinating and integrating them into the appropriate paragraphs and graphics of the OPORD and into products such as SOPs, OPLANs, and training plans.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance.
2. Coordinate with other services, local communities and Host Nation Support (HNS) (if overseas) for additional assets and requirements.
3. Identify details of planning elements for the petroleum and/or water supply system in the theater as follows:
  - a. Amount and type of product to be distributed (theater requirements).
  - b. Potential receipt and distribution points (storage locations).
  - c. Distribution systems or methods available (transportation mode).
  - d. Equipment available for use (pump/pipeline equipment/rail/truck/boat).
  - e. Organizations and personnel available to operate the system and its equipment (units).
4. Design theater petroleum supply and water supply system using the following planning considerations:
  - a. Mission and force (size and composition) to be supported.
  - b. Requirements of that force.
  - c. Seasonal requirements.
  - d. Operational Tempo.
  - e. The capability of installations and/or units (to include the Host Nation [HN]) to provide required support.
  - f. The speed with which pipelines and hose lines (for petroleum products) can be constructed and extended.
  - g. Requirements for terminals, offshore unloading facilities, and distribution points.
  - h. Requirements for both petroleum bulk and packaged products.

**Performance Steps**

- i. The availability of petroleum operating units and other units needed to construct, install, and maintain petroleum distribution and storage facilities and communications.
  - j. Terrain and environmental conditions, to include its impacts on installing petroleum, oil, and lubricants (POL) facilities and POL usage factors, water storage policy, water production capacities, water conservation measures, requirements for additional equipment, and water distribution priorities.
  - k. Specific water and support requirements for other services, allied forces, or HN labor forces.
  - l. Recognition of applicable Standardization Agreement (STANAG).
  - m. Recognition and development of Operational Project (OPROJ) stocks that support specific operational plans. This is particularly critical for water operations in arid regions.
  - n. Unique considerations for water support.
    - (1) Level of adherence by both threat and allied forces to Article 54 of the Geneva Convention, which prohibits destruction or disabling water supplies and water supply installations.
    - (2) Care of HN labor forces.
    - (3) Care of war refugees or displaced civilians.
    - (4) Care of enemy prisoners of war (EPWs).
    - (5) Assumption of no HNS in arid regions.
5. Develop plans for petroleum and water supply system in the following categories:
- a. A logistical plan (prepared starting well in advance of operations) that addresses the following areas:
    - (1) Translation of the factors such as troop strengths, numbers and types of fuel consuming equipment, and tactical objectives into specific fuel.
    - (2) Buildup of the system in theater to ensure that products, distribution facilities, and operating units and personnel will be available when needed.
  - b. An operational plan (prepared prior to the start of operations and revised continually concurrent with operations) that addresses the following areas:
    - (1) Reaching the rated capacity of the distribution system.
    - (2) Maintaining system capacity.
    - (3) Revisions due to tactical developments, losses in handling capacity due to enemy action, and other factors that keep the system from operating as planned.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<u>GO</u>	<u>NO-GO</u>
1. Applied risk management procedures.	—	—
2. Coordinated with other services, local communities and Host Nation Support (HNS) (if overseas) for additional assets and requirements.	—	—
3. Identified details of planning elements for the petroleum and/or water supply system in the theater.	—	—
4. Designed theater petroleum supply and water supply system.	—	—
5. Developed plans for petroleum and water supply system.	—	—

**Evaluation Guidance:** Score the Soldier GO if all steps are passed. Score the Soldier NO-GO if any steps are failed. If the Soldier scores NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

FM 10-52  
FM 10-52-1  
FM 10-67  
FM 10-67-1

**Related**

Subject Area 17: EVALUATING CLASS III AND PIPELINE OPERATIONS

**Plan for Class III Supply Point Operations**

**101-92F-5204**

**Conditions:** Given the requirement to plan bulk petroleum operations in a field environment. Materials required to perform task: operations plan (OPLAN) and Time-Phased Force Deployment Data (TPFDD) for the Theater of Operations (TO) if overseas, operations order (OPORD) for mission at hand, Fragmentary Order (FRAGO) for specific task, and other appropriate reference materials.

**Standards:** Plan a Class III Supply Point Operation which is able to support the assigned mission.

**Performance Steps**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls, command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Integrate risk management into planning and preparing for operations and training activities.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance.
2. Prepare Class III Supply Point Operation plan.
  - a. Receive command guidance on mission and determine requirements.
    - (1) Identify distribution and storage requirements by processing petroleum source data.
    - (2) Identify facilities, equipment, and units required to support distribution and storage operations.
    - (3) Identify terrain suitable for bulk petroleum distribution operations.
    - (4) Coordinate for construction and maintenance of terminals and tank farms and pipelines with supporting engineer units as required.
    - (5) Plan operations to comply with applicable national, state, local, and Host Nation (HN) environment laws.
  - b. Review the documents below to identify policies, procedural requirements, and agencies or documents where required information can be obtained.
    - (1) OPLAN and TPFDD for the TO if overseas.
    - (2) OPLAN and OPORD for the current mission or operation.
    - (3) Communication-Electronic Operating Procedures (CEOI).
    - (4) Reconnaissance Report or coordinate to conduct site recon for the area assigned for Supply Point Operations.
    - (5) Quadripartite Standardization Agreement (QSTAG) and Standardization Agreement (STANAG) if applicable.
3. Develop Class III Supply Point Operation plan.
  - a. Analyze courses of action that meet mission requirements and factors for each course of action indicating problems and deficiencies.
  - b. Evaluate the advantages/disadvantages for each course of action under consideration and determine which can be best be logically supported.
  - c. Integrate risk controls, environment considerations, and safety into training, OPORDs, OPLANs, and standing operating procedures (SOPs).
4. Coordinate and integrate Class III Quality Surveillance and Safety Program.
  - a. Ensure fuel samples are being taken from all fuelers and submitted to supporting fuel laboratory in accordance with appropriate reference materials and unit SOP.

**Performance Steps**

- b. Verify and coordinate for personnel, equipment, and fuel additives (FSII, SDA, CI) to be injected to fuel that are found out of specifications.
  - c. Verify fuel sample results to ensure products are within specifications requirements and re-samples are submitted for fuel samples that did not met specification requirements.
  - d. Verify that vehicle and equipment fueling aircraft had recirculated, tested, and fuel is within specifications in accordance with appropriate reference materials and SOP.
  - e. Verify petroleum operations for compliance with safety directives and MSDS.
5. Coordinate and integrate transportation support with Transportation Branch.
    - a. Identify receipt and distribution points.
    - b. Identify distribution system or method.
    - c. Identify current status of transportation assets.
    - d. Prepare overall plans for control and movement of bulk petroleum products by means other than pipeline.
  6. Coordinate with other services, local communities and Host Nation Support (HNS) (if overseas) for additional assets and requirements.
    - a. Determine additional fuel support requirements for other services, allied forces, and HNS in accordance with OPLAN/OPORD and appropriate reference materials.
    - b. Incorporate their fuel requirements and fuel handling equipment.
      - (1) Number of gallons required for each locations.
      - (2) Type of equipment and number of gallons that equipment can store.
      - (3) Method of delivery and special equipment to transfer product (NATO adaptor, hose, and so on) to their equipment.
  7. Identify communications requirements with units and coordinate signal support.
  8. Identify and coordinate personnel requirements with S1.
  9. Select Class III Supply Point within the areas assigned for operation by your chain of command; based on reconnaissance information and site selected by the Class III Platoon Sergeant.
  10. Identify and coordinate any unique operational requirements, security requirements, fire and safety requirements, or environmental protection requirements based on the operational situation.
  11. Identify and coordinate vehicle/equipment maintenance support requirements and status with S4.
  12. Establish procedures to collect, consolidate, maintain, prepare, and submit required reports in accordance with OPORD and unit SOP.
  13. Submit Class III Supply Point Operation plan to Plans Officer for review, corrections, compliance with Commander's guidance, and approval and/or modification by the Deputy Commander.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
1. Applied risk management procedures.	—	—
2. Prepared Class III Supply Point Operation plan.	—	—
3. Developed Class III Supply Point Operation plan.	—	—
4. Coordinated and integrated Quality Surveillance and Safety Program	—	—
5. Coordinated and integrated transportation support with Transportation Branch.	—	—

<b>Performance Measures</b>	<b><u>GO</u></b>	<b><u>NO-GO</u></b>
6. Coordinated with other services, local communities, and Host Nation Support (HNS) (if overseas) for additional assets and requirements.	—	—
7. Identified communications requirements with units and coordinated signal support.	—	—
8. Identified and coordinated personnel requirements with S1.	—	—
9. Selected Class III Supply Point within the assigned area of operation by chain of command; based on reconnaissance information and site selected by the class III Platoon Sergeant.	—	—
10. Identified and coordinated any unique operational requirements, security requirements, environmental protection requirements, fire and safety requirements based on the operational situation.	—	—
11. Identified maintenance support requirement and vehicles/equipment status with S4.	—	—
12. Established procedures to collect, consolidate, maintain, prepare, and submit reports in accordance with OPORD and unit SOP.	—	—
13. Submitted Class III Supply Point Operation plan to Plan Officer for review, corrections, compliance with Commander's guidance, and approval and/or modifications by the Deputy Commander.	—	—

**Evaluation Guidance:** Score the Soldier GO if all steps are passed. Score the Soldier NO-GO if any steps are failed. If the Soldier scores NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**  
FM 10-67-1

**Related**



## Evaluate Petroleum Pipeline Operations

101-92F-5205

**Conditions:** Given the requirement to evaluate petroleum pipeline operations in a field environment. Personnel and materials required to perform task: two military occupational specialty (MOS)-qualified (92F) Soldiers; petroleum pipeline and the unit operating it, operational data/records, risk management procedures, unit standing operating procedure (SOP), DA Form 2077 (Petroleum Products Laboratory Analysis Report), DA Form 4818 (Petroleum Products - Pump Station Operations Log), DA Form 5464-R (Petroleum Products Pipeline Leakage Report), and full access to all reference materials.

**Standards:** Conduct an evaluation of petroleum pipeline operations, submitting a written report in accordance with unit policies which identifies any shortcomings and recommends corrective actions.

### Performance Steps

#### DANGER

**FAILURE TO PERFORM THIS TASK CORRECTLY MAY RESULT IN DAMAGE TO EQUIPMENT OR INJURY OR DEATH TO PERSONNEL.**

1. Apply risk management procedures.
  - a. Understand and implement the risk management process, risk controls and command guidance directed by higher headquarters (HQ).
  - b. Assess variable hazards continuously and report risks and risk reduction measures as appropriate to the chain of command.
  - c. Implement risk controls by coordinating and integrating them into the appropriate paragraphs and graphics of the operations order (OPORD) and into products such as SOPs, operations plans (OPLANS), and training plans.
  - d. Assess subordinates effectiveness in managing risk in order to gain insight into areas for improvement and gather feedback on their understanding and application of risk guidance.
2. Verify applicable Material Safety Data Sheets (MSDS) are maintained.
3. Check that appropriate personal protective equipment is worn.
4. Schedule an evaluation for a pipeline operation in accordance with unit SOP.
5. Evaluate the following areas for the unit operating the pipeline as a minimum, as well as any other areas of interest established by the local commander.
 

Verify that the unit-

  - a. Publishes and adheres to SOPs addressing operations, area defense quality surveillance, pilferage control, fire and safety, and environmental considerations.
  - b. Sets up work schedules based on the daily pumping order.
  - c. Reviews DA Form 2077 to make decisions on the use or disposition of products.
  - d. Establishes environmental stewardship programs with a particular emphasis on spill prevention, control, and cleanup.
  - e. Schedules fire protection training.
  - f. Prepares monthly and annual reports as required by the unit SOP.
  - g. Maintains multiple communication links between pumping stations.
  - h. Submits DA Form 285 when accidents occur.
  - i. Maintains the following records of pump station operations:
    - (1) DA Form 4818.

**Performance Steps**

(2) DA Form 5464-R.

- j. Publishes and adheres to maintenance schedules for the pipeline and other assigned equipment.
  - k. Establishes troop quarters no closer than 100 feet to pipeline, but no farther than 200 feet.
6. Prepare a written report of the evaluation in accordance with unit policies that identifies any shortcomings and recommends corrective actions.

**Evaluation Preparation:** See task Conditions and Standards.

<b>Performance Measures</b>	<u><b>GO</b></u>	<u><b>NO-GO</b></u>
1. Applied risk management procedures.	—	—
2. Verified applicable Material Safety Data Sheets (MSDS) are maintained.	—	—
3. Checked that appropriate personal protective equipment is worn.	—	—
4. Scheduled an evaluation for a pipeline operation in accordance with unit SOP.	—	—
5. Evaluated the following areas for the unit operating the pipeline as a minimum, as well as any other areas of interest established by the local commander.	—	—
6. Prepared a written report of the evaluation in accordance with unit policies that identifies any shortcomings and recommends corrective actions.	—	—

**Evaluation Guidance:** Score the Soldier GO if all steps are passed. Score the Soldier NO-GO if any steps are failed. If the Soldier scores NO-GO, show what was done wrong and how to do it correctly.

**References**

**Required**

- DA FORM 2077
- DA FORM 4818
- DA FORM 5464-R
- FM 10-416
- FM 10-67-1

**Related**

## Chapter 4

### Duty Position Tasks

#### ***92F-PETROLEUM SUPPLY SPECIALIST, CMF 92.***

a. Major Duties. The petroleum supply specialist supervises or receives, stores, accounts for and cares for, dispenses, issues, and ships bulk or packaged petroleum, oils, and lubricants (POL) products. Duties for MOS 92F at each level of skill are:

(1) *MOSC 92F10.* Receives and stores bulk and package POL Products. Issues and dispenses bulk fuels and water from storage and distribution facilities to using units. Selects and submits samples of POL to laboratory for testing. Performs petroleum and water accounting duties. Operates equipment associated with petroleum and water distribution system and multi-product pipeline system. Fuels and defuels vehicles, aircraft, and stationary equipment. Takes emergency precautions to prevent harm to self and facilities in event of petroleum spillage or fire.

(2) *MOSC 92F20.* Performs duties shown at preceding level of skill. Assigns duties, spot checks work adequacy, and instructs and supervises subordinates in work techniques and procedures. Determines source of product contamination in storage areas and pipelines and directs reclamation and disposition for petroleum products. Assures adherence to safety procedures and ensures keeping of efficient, clean, and safe work environment. Supervises aircraft refueling and defueling operations.

(3) *MOSC 92F30.* Performs supervisory duties shown in preceding level of skill. Estimates requirements for personnel, equipment, user/organizational maintenance, and repair of petroleum distribution facilities. Schedules and dispatches petroleum and water products through pipelines and other distribution facilities or equipment. Initiates and supervises environmental protection activities and contingency plans. Reviews, consolidates, and prepares technical, personnel, and administrative reports associated with POL and water activities in assigned unit. Supervises unit level quality surveillance operations.

(4) *MOSC 92F40.* Performs supervisory duties shown in preceding level skill. Supervises and monitors quality surveillance programs and activities. Ensures compliance with fire and safety regulations.

(5) *MOSC 92F50.* Performs supervisory duties shown at preceding level of skill. Performs duties as petroleum quality assurance representative. Assists command and staff officers in appraisals of petroleum and water operations. Assists in coordination and implementation of operations, training programs, administrative matters, and communication activities.

b. Physical Demands Rating and Qualifications for Initial Award of MOS. The petroleum supply specialist must possess the following qualifications:

- (1) A physical demands rating of very heavy.
- (2) A physical profile of 211221.
- (3) Normal color vision.
- (4) Minimum scores of 90 in aptitude area CL and 90 in aptitude area OF.
- (5) Must possess a valid state motor vehicle operator license.

c. Additional Skill Identifiers.

- (1) H7—Petroleum Vehicle Operations.
- (2) P5—Master Fitness Trainer.
- (3) 2S—Battle Staff Operations (skill level 3 and above).
- (4) 4A—Reclassification Training.

d. Physical Requirements and Standards of Grade. Physical requirements and SG relating to each skill level are listed in the following tables:

- (1) Table 10-92F-1. Physical requirements.
- (2) Table 10-92F-2. Standards of grade TOE/MTOE.
- (3) Table 10-92F-3. Standards of grade TDA.

# Appendix A

## HANDS-ON EVALUATION

### HANDS-ON EVALUATION (DA FORM 5164-R) INSTRUCTIONS

DA Form 5164-R (Hands-On Evaluation) allows the trainer to keep a record of the performance measures a soldier passes or fails on each task. Figure A-1 shows a sample of a completed DA Form 5164-R.

#### **Before evaluation:**

1. Obtain a blank copy of DA Form 5164-R, which you may locally reproduce on 8 ½ x 11 paper.
2. Enter the task title and 10-digit number from the STP task summary.
3. In Column a, enter the performance measure numbers from the task summary.
4. In Column b, enter the performance measure corresponding to the number in Column a (you may abbreviate this information, if necessary).
5. Locally reproduce the partially completed form when evaluating more than one soldier on the task or when evaluating the same soldier more than once.

#### **During evaluation:**

1. Enter the date just before evaluating the soldier's task performance.
2. Enter the evaluator's name, the soldier's name, and the unit.
3. For each performance measure in Column b, enter a check in Column c (PASS) or Column d (FAIL), as appropriate.
4. Compare the number of performance measures the soldier passes (and, if applicable, which ones) against the task standards specified in the task summary. If the standards are met or exceeded, check the GO block under STATUS; otherwise, check the NO-GO block.

HANDS-ON EVALUATION For use of this form, see STP 11-25S14-SM-TG; the proponent agency is TRADOC		DATE 1 November 2005	
TASK TITLE Prepare Accountability Forms for Petroleum Products		TASK NUMBER 101-92F-1412	
ITEM a	PERFORMANCE STEP TITLE b	SCORE (Check One)	
		PASS c	FAIL d
1.	Prepared DA Form 3643 - Daily Issues of Petroleum Products.	<input checked="" type="checkbox"/> P	<input type="checkbox"/> F
2.	Prepared DA Form 2765-1 - Request for Issue or Turn-in.	<input type="checkbox"/> P	<input checked="" type="checkbox"/> F
3.	Prepared DD Form 1898 - Fuel Sales Slip.	<input checked="" type="checkbox"/> P	<input type="checkbox"/> F
4.	Turned-in completed daily accountability forms to supervisor.	<input checked="" type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
EVALUATOR'S NAME SSG Eloppe		UNIT HHC, 49th QM Group	
SOLDIER'S NAME SPC Hall		STATUS <input type="checkbox"/> GO <input checked="" type="checkbox"/> NO GO	

DA FORM 5164-R, SEP 85

EDITION OF DEC 82 IS OBSOLETE

APD V2.01

Figure A-1. Sample of a Completed DA Form 5164-R

## Appendix B

# FIELD EXPEDIENT SQUAD BOOK

### FIELD EXPEDIENT SQUAD BOOK (DA FORM 5165-R) INSTRUCTIONS

DA Form 5165-R (Field Expedient Squad Book) allows the trainer to keep a record of task proficiency for a group of soldiers. Figure B-1 shows a sample of a completed DA Form 5164-R.

#### **Before evaluation:**

1. Obtain a blank copy of DA Form 5165-R, which you may locally reproduce on 8 ½ x 11 paper.
2. Locally reproduce the partially completed form if you are evaluating more than nine soldiers.

#### **During evaluation:**

1. Enter the names of the soldiers you are evaluating, one name per column, at the top of the form.
2. Under STATUS, record (in pencil) the date in the GO block if the soldier demonstrated task proficiency to soldier's manual standards. Keep this information current by always recording the most recent date on which the soldier demonstrated task proficiency. Record the date in the NO-GO block if the soldier failed to demonstrate task proficiency to soldier's manual standards. Soldiers who failed to perform the task should be retrained and reevaluated until they can meet the standards. When the standards are met, enter the date in the appropriate GO block and erase the previous entry from the NO-GO block.

#### **After evaluation:**

1. Read down each column (GO/NO-GO) to determine the training status of an individual. This will give you a quick indication of which tasks a soldier needs training on.
2. Read across the rows for each task to determine the training status of all soldiers. You can readily see which tasks to focus training on.
3. Line through the STATUS column of any soldier who leaves the unit.

FIELD EXPEDIENT SQUAD BOOK		SHEET 1 OF 3																
For use of this form, see STP 10-92A10-SM-TG; the proponent agency is TRADOC.																		
USER APPLICATION		SOLDIER'S NAME																
STP 21-1-SMCT Soldier's Manual of Common Tasks		Hughes Murphy Smith Jones Gray																
TASK NUMBER AND TITLE	STATUS																	
	GO	NO-GO	GO	NO-GO	GO	NO-GO	GO	NO-GO	GO	NO-GO	GO	NO-GO						
071-326-0512 Estimate Range	4-17-04		3-17-04		3-17-04		3-17-04		4-2-04									
071-329-1001 Identifying Terrain	4-2-04		4-5-04		4-5-04		4-5-04		4-5-04									
071-311-2024 Battlelight Zero	4-8-04		4-8-04		4-15-04		4-15-04		4-15-04									
678-920-1001 Armored Vehicles	5-8-04		5-8-04						5-8-04									
071-329-1002 Grid Coordinates																		
071-329-1003 Magnetic Azimuth																		
071-311-2001 Magnet Aligned Rifle																		
071-503-1001 MINT M17-SELES																		
031-503-1007 Dreamtamine																		
031-503-1009 MOPP Gear																		
081-831-1031 Buddy-Aid																		
081-831-1005 Revert Shock																		
081-831-1009 Frostbite																		
071-326-0511 Revert to Flares																		
071-325-4407 Empty Hand Grenades																		
031-503-1023 Exchange MOPP Gear																		
081-831-1005 Revert Shock																		

SAMPLE

Figure B-1. Sample of a Completed DA Form 5165-R



## GLOSSARY

AAFARS	Advanced Aviation Forward Area Refueling System
AAR	after action review
A/C	alternating current
ACCP	Army Correspondence Course Program
AFFF	aqueous film forming foam
AHS	Assault Hoseline System
AIPD	Army Institute for Professional Development
AIT	Advanced Individual Training
AN	annually
ANCOC	Advanced NCO Course
API	American Petroleum Institute
AR	Army regulation
ASTM	American Standard of Testing Materials
ATC	Air Traffic Control
AVGAS	aviation gasoline
BA	biannually
BII	basic issue items
BNCOC	Basic NCO Course
BSW	bottom sediment and water
BTU	beach terminal unit
BW	bi-weekly
C	Celsius
CEOI	Communication-Electronics Operating Instructions
CFM	cubic feet per minute
CFR	Code of Federal Regulation
cm	centimeter(s)
COMMZ	communications zone
COMSEC	communications security
CSOI	Communication Single Operating Instructions
CTT	common task test
CZ	combat zone
DA	Department of the Army
D.C.	District of Columbia
DD	Department of Defense
DF	diesel fuel
DF-A	diesel fuel-Arctic
DF-M	diesel fuel-Marine
DFSC	Defense Fuel Supply Center
DOD	Defense of Defense
DS	direct support
ECO	Environmental Compliance Officer
EPA	Environmental Protection Agency
EPW	enemy prisoner of war
F	Fahrenheit
FARE	Forward Area Refueling Equipment
FM	field manual
FP	Force Provider
FPFS	Force Provider Fuel System
FRAGO	Fragmentary Order
Freq	Frequency
FRP	Facility Response Plan
FSSP	Fuel System Supply Point

GAA	grease, artillery, and automotive
GPM	gallons per minute
GS	general support
HAZCOM	hazardous communications
HAZMIN	Hazardous Waste Minimization
HEMTT	Heavy Extended Mobility Tactical Truck
HM	hazardous material
HMIS	Hazardous Material Information Sheets
HMMWV	high-mobility multipurpose wheeled vehicle
HN	Host Nation
HNS	Host Nation Support
HQ	headquarters
HTARS	HEMTT Tanker Aviation Refueling System
HW	hazardous waste
IP	Institute of Petroleum
IPDS	Inland Petroleum Distribution System
ISCP	Installation Spill Control Plan
JP	jet propulsion
LHS	Load Handling System
LMFF	Load Handling System Modular Fuel Farm
LO	lubrication order
METL	mission-essential task list
METT-TC	mission, enemy, terrain and weather, troops and support available, time available, civilian considerations
MIL-HDBK	military handbook
ml	milliliter
MO	monthly
MOGAS	motor gasoline
MOS	military occupational specialty
MOSC	military occupational specialty code
MOUT	Military Operation in Urban Terrain
MPH	miles per hour
MSCW	modified system cold weather
MSDS	Material Safety Data Sheets
MSG	Master Sergeant
MTS	Movement Tracking System
NA	not applicable
NATO	North Atlantic Treaty Organization
NCO	noncommissioned officer
NCOIC	noncommissioned officer in charge
NMC	non-mission capable
No.	number
NSN	national stock number
ODCP	Oil Discharge Contingency Plan
OF	optional form
OG	on grade
OPORD	operations order
OPPROJ	Operational Project
PAM	pamphlet
PLS	Palletized Load System
PMCS	Preventive Maintenance Checks and Services
POL	petroleum, oil, and lubricants
PPE	personal protective equipment
PPM	parts per million
psi	pounds per square inch
psid	pounds per square inch differential

PV1	Private
QSTAG	Quadripartite Standardization Agreement
QT	quarterly
R3D2S	Remote Refueling Rearming Deployable Distribution System
ROM	Refuel on the Move
RPM	revolutions per minute
SA	semiannually
SFC	Sergeant First Class
SFU	sufficient for use
SGM	Sergeant Major
SGT	Sergeant
SL	skill level
SM	soldier's manual
SMCT	soldier's manual of common tasks
SM/TG	soldier's manual/trainer's guide
SOP	standing operating procedure
SPC	Specialist
SPCC	Spill Prevention Control and Countermeasures
SPRP	Spill Prevention Response Plan
SSA	Supply Support Activity
SSG	Staff Sergeant
STANAG	Standardization Agreement
STP	soldier training publication
Sust	Sustainment
TAMMS	The Army Maintenance Management System
TAU	Twin Agent Unit
TB	technical bulletin
TG	trainer's guide
TM	technical manual
Tng	Training
TO	Theater of Operations
TPFDD	Time-Phased Force Deployment Data
TPT	Tactical Petroleum Terminal
TPU	Tank and Pump Unit
TSOP	tactical standing operating procedure
UNIT	Trained in the Unit
US	United States (of America)
UV	ultraviolet
USA	United States Army
VA	Virginia
WK	weekly

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# REFERENCES

## Required Publications

Required publications are sources that users must read in order to understand or to comply with this publication.

### Army Regulations

AR 190-13	The Army Physical Security Program 30 September 1993
AR 200-1	Environmental Protection and Enhancement 21 February 1997
AR 710-2	Supply Policy Below the National Level 8 July 2005

### Department of Army Forms

DA forms are available on the Army Electronic Library (AEL) and the APD web site, [www.apd.army.mil](http://www.apd.army.mil).

DA FORM 285	U.S. Army Accident Report
DA FORM 1296	Stock Accounting Record
DA FORM 1594	Daily Staff Journal or Duty Officer's Log
DA FORM 1804	Petroleum Sample
DA FORM 2064	Document Register for Supply Actions
DA FORM 2077	Petroleum Products Laboratory Analysis Report
DA FORM 2404	Equipment Inspection and Maintenance Worksheet
DA FORM 2765-1	Request for Issue or Turn-in
DA FORM 3643	Daily Issues of Petroleum Products
DA FORM 3644	Monthly Abstract of Issues of Petroleum Products and Operating Supplies
DA FORM 3853-1	Innage Gage Sheet (Using Innage Tape and Bob)
DA FORM 3853-2	Outage Gage Sheet (Using Innage Tape and Bob)
DA FORM 3853-3	Outage Gage Sheet (Using Outage Tape and Bob)
DA FORM 3857	Commercial Deliveries of Bulk Petroleum Products Checklist
DA FORM 4193	Petroleum Products Pump Station Hourly Operations Record
DA FORM 4702-R	Monthly Bulk Petroleum Accounting Summary
DA FORM 4702-R-E	Monthly Bulk Petroleum Accounting Summary (EGA)
DA FORM 4786	Petroleum Products -Tank Farm Intake Record
DA FORM 4818	Petroleum Products - Pump Station Operations Log
DA FORM 5138-R	Separation Action Control Sheet
DA FORM 5463-R	Petroleum Products Tank Farm Outturn Record
DA FORM 5464-R	Petroleum Products Pipeline Leakage Report
DA FORM 5830-R	POL Credit Card/AV Fuel Indentaplate Control Log
DA FORM 5831-R	Petroleum Product Inventory Control Sheet
DA FORM 5984-E	Operator's Permit Record (EGA)
DA FORM 5987-E	Motor Equipment Dispatch (EGA)
DA FORM 5988-E	Equipment Inspection Maintenance Worksheet (EGA)
DA FORM 7382-R	Sling Load Inspection Record
DA FORM 7598	Vehicle Load Card

### Department of Army Pamphlets

DA PAM 350-59	Army Correspondence Course Program Catalog 1 October 2002
DA PAM 710-2-1	Using Unit Supply System (Manual Procedures) 31 December 1997
DA PAM 710-2-2	Supply Support Activity Supply System: Manual Procedures 30 September 1998
DA PAM 750-8	The Army Maintenance Management System (TAMMS) Users Manual 22 August 2005

### Department of Defense Forms

DD Forms are available from the OSD web site, [www.dior.whs.mil](http://www.dior.whs.mil).

DD FORM 250	Materiel Inspection and Receiving Report
DD FORM 250-1	Tanker/Barge Materiel Inspection and Receiving Report
DD FORM 1348-1A	Issue Release/Receipt Document
DD FORM 1898	Fuel Sale Slip
DD FORM 1970	Motor Equipment Utilization Record

### Field Manuals

FM 3-04.111	Aviation Brigades 21 August 2003
FM 3-11	Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical Defense Operations (This item is included on EM 0205) 10 March 2003
FM 3-19.30	Physical Security 8 January 2001
FM 3-100.4	Environmental Considerations in Military Operations 15 June 2000
FM 3-100.12	Risk Management for Multiservices Tactics, Techniques, and Procedures 15 February 2001
FM 5-482	Military Petroleum Pipeline Systems 26 August 1994
FM 7-0	Training the Force 22 October 2002
FM 7-1	Battle Focused Training 15 September 2003
FM 10-52	Water Supply in Theaters of Operations 11 July 1990
FM 10-52-1	Water Supply Point Equipment and Operations 18 June 1991
FM 10-67	Petroleum Supply in Theaters of Operations 18 February 1983
FM 10-67-1	Concepts and Equipment of Petroleum Operations 2 April 1998
FM 10-67-2	Petroleum Laboratory Testing and Operations 2 April 1997
FM 10-416	Petroleum Pipeline and Terminal Operating Units 12 May 1998
FM 10-450-3	Multiservice Helicopter Sling Load: Basic Operations and Equipment 10 April 1997
FM 10-450-4	Multiservice Helicopter Sling Load: Single-Point Load Rigging Procedures 30 May 1998
FM 10-450-5	Multiservice Helicopter Sling Load: Dual-Point Rigging Procedures 30 August 1999
FM 25-4	How To Conduct Training Exercises 10 September 1984
FM 25-5	Training for Mobilization and War 25 January 1985
FM 100-14	Risk Management 23 April 1998

### Other Product Types

49 CFR 172.500	Transportation—Applicability of Placarding Requirements 1 October 2004
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ASTM STANDARDS	Annual Book of ASTM Standards 1 January 2001
DOD 4140.25-M	DOD Management of Bulk Petroleum Products, Natural Gas and Coal Volumes I - IV 1 June 1994
MIL-HDBK-200	Military Standardization Handbook: Quality Surveillance Handbook for Fuels, Lubricants, and Related Products 1 January 1996
MIL-HDBK-1022A	Department of Defense Handbook Petroleum Fuel Facilities 1 November 1999
MIL-STD-3004A	Quality Surveillance for Fuels, Lubricants, and Related Products 5 November 2003

### **Soldier Training Publications**

STP 21-1-SMCT	Soldier's Manual of Common Tasks Skill Level 1 11 October 2005
STP 21-24-SMCT	Soldier's Manual of Common Tasks (SMCT) Skill Levels 2-4 31 August 2003

### **Technical Bulletins**

TB 11-5825-291-10-2	Soldiers Guide for Precision Lightweight GPS Receiver (PLGR) AN/PSN-11 (NSN 5825-01-374-6643) and AN/PSN-11(V) (5825-01-395-3513) (This item is included on EM 0114) 1 December 1996
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### **Technical Manuals**

TM 5-315	Firefighting and Rescue Procedures in Theaters of Operations 20 April 1971
TM 5-3835-220-13&P	Operator, Unit, and Intermediate Direct Support Maintenance Manual (Including Repair Parts and Special Tools List) for Tactical Petroleum Terminal Model WBEI-10002 (NSN 3835-01-182-1976) 18 June 1987
TM 5-4310-452-14	Operators, Organizational, Direct Support and General Support Maintenance Manual for Compressor, Rotary, Air, DED, 250 CFM 100 psi Trailer-Mounted (NSN 4310-01-158-3262) Component of Pneumatic Tool and Compressor Outfit (3820-01-195-4167) (This item is included on EM 0150) 27 December 1990
TM 5-4320-305-10	Operator's Manual for Pump Unit, Centrifugal, Hoseline, 600 GPM, DED, Model US 612ACD-1 NSN 4320-01-193-3429 20 February 1987
TM 5-4330-211-12	Operator and Organizational Maintenance Manual (Including Repair Parts and Special Tools List): Filter-Separator, 350 GPM Optimum Performance (General Steel Tank Co., Model 0217) (NSN 4330-00-150-6123); (Beta Systems Inc., Model 010-2-001) (4330-00-177-8485), and (Keene Corporation Model 844-18-V-350AL) and (Gil Inc. Model GFS-18-V-350) (4330-00-177-8485) (This item is included on EM 0087) 2 October 1971
TM 5-4330-217-12	Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools List) for Filter Separator, Liquid Fuel, 100 GPM, Frame-Mounted (Keene Corp., Model 844-5-V-100AL) and (Velcon Filters, Inc., Model V-1520-ANZ) (Beta Systems, Model FS100-VM) (NSN 4330-00-491-4957) (This Item is Included on EM 0087) 5 April 1973
TM 5-4930-237-10	Operator's Manual for HEMTT Tanker Aviation Refueling System (HTARS) (NSN 4930-01-269-2273) Model Number 50-0051 (This item is included on EM 0087) 10 March 1989
TM 5-5430-210-12	Operator's and Organizational Maintenance Manual for Tank, Fabric; Collapsible, POL, 3,000 Gallon (11,355 Liter) (NSN 5430-00-268-8187) 10,000 Gallon (37,850 Liter) (5430-00-052-3412) and (5430-00-641-

- 8552) 20,000 Gallon (75,700 Liter) (5430-01-215-7525) and 50,000 Gallon (189,250 Liter) (5430-00-182-8181) 30 November 1978
- TM 5-5430-214-13&P Operator and Organizational Maintenance Instruction, Repair Parts and Special Tools List for Tank, Fabric, Collapsible 5,000 Barrel Petroleum (NSN 5430-01-160-3528) (This item is included on EM 0087) 31 December 1986
- TM 5-6630-218-10 Operator's Manual for Aviation Fuel Contaminate Test Kit, (NSN 6630-01-008-5524) (This item is included on EM 0087) 23 May 1990
- TM 9-2320-279-10-1 Operators Manual for M977 Series 8X8 Heavy Expanded Mobility Tactical Trucks (HEMTT), Truck, Cargo, With Winch, M977 (NSN 2320-01-097-0260) Truck, Cargo, With Winch, M977A2 (2320-01-493-3774) Truck, Cargo, With Winch, M977A2R1 (2320-01-493-3782) Truck, Cargo, Without Winch, M977 (2320-01-099-6426) Truck, Cargo, Without Winch, M977A2 (2320-01-493-3779) Truck, Cargo, Without Winch, M977A2R1 (2320-01-493-3785) Truck, Tank, Fuel, With Winch, M978 (2320-01-097-0249) Truck, Tank, Fuel, With Winch, M978A2 (2320-01-492-8216) Truck, Tank, Fuel, With Winch, M978A2R1 (2320-01-492-8226) Truck, Tank, Fuel, Without Winch, M978 (2320-01-100-7672) Truck, Tank, Fuel, Without Winch, M978A2 (2320-01-492-8215) Truck, Tank, Fuel, Without Winch, M978A2R1 (2320-01-492-8225) Truck, Tractor, With Winch, Without Crane, M983 (2320-01-097-0247) Truck, Tractor, With Winch, Without Crane, M983A2 (2320-01-492-8223) Truck, Tractor, With Winch, Without Crane, M983A2R1 (2320-01-492-8231) Truck, Tractor, With Winch, With Crane, M983 (2320-01-099-6421) Truck, Wrecker-Recovery, M984 (2320-01-097-0248) Truck, Wrecker-Recovery, M984A1 (2320-01-195-7641) Truck, Wrecker-Recovery, M984A2 (2320-01-492-8224) Truck, Wrecker-Recovery, M984A2R1 (2320-01-492-8233) Truck, Cargo, With Winch, M985 (2320-01-097-0261) Truck, Cargo, With Winch, M985A2 (2320-01-492-8214) Truck, Cargo, With Winch, M985A2R1 (2320-01-493-3787) Truck, Cargo, Without Winch, M985 (2320-01-100-7673) Truck, Cargo, Without Winch, M985A2 (2320-01-492-8201) Truck, Cargo, Without Winch, M985A2R1 (2320-01-493-3789) Truck, Cargo, With Winch, M985E1 (2320-01-194-7032) Truck, Cargo, With Winch, M985E1A2 (2320-01-493-3790) Truck, Cargo, With Winch, M985E1A2R1 (2320-01-493-3792) (This item is included on EM 0038) 21 November 1986
- TM 9-2330-272-14 Operator's, Organizational, Direct Support, and General Support Maintenance Manual for Semitrailer, Tank Fuel, 5000 Gallon, 4-Wheel, M131A4 (NSN 2330-00-994-9459) M131A5 (2330-00-226-6079); Semitrailer, Tank: Fuel Servicing, 5000 Gal., 4-Wheel, M131A4C (2330-00-894-9458) and M131A5C (2330-00-226-6080) (This item is included on EM 0049 & EM 0087) 30 June 1992
- TM 9-2330-330-14&P Operator's, Organizational, Direct Support, and General Support Maintenance Manual (Including Repair Parts and Special Tools List) for Semitrailer, Fuel Tanker: 5000-Gallon, Fuel-Dispensing, Automotive, M969A3 (NSN 2330-01-495-0043) 30 November 2005
- TM 9-2330-356-14 Operator's, Unit, Direct Support, and General Support Maintenance Manual for Semitrailer, Tank: 5000 Gallon, Bulk Haul, Self-Load/Unload M967 (NSN 2330-01-050-5632) M967A1 (2330-01-155-0046) Semitrailer, Tank: 5000 Gallon, Fuel Dispensing, Automotive M969 (2330-01-050-5634) M969A1 (2330-01-155-0048) Semitrailer, Tank: 5000 Gallon, Fuel Dispensing, Under/Overwing Aircraft M970 (2330-01-050-5635) M970A1 (2330-01-155-0047) (This item is included on EM 0049) 26 October 1990



TM 9-2330-398-10 Operator's Manual for Semitrailer, Tank, 5000-Gallon, Fuel Dispensing, Automotive M969A2 (NSN 2330-01-377-9337) (This item is included on EM 0049 & EM 0087) 15 June 1996

TM 9-6230-210-13&P Operator, Unit, and Direct Support, Maintenance Manual Including Repair Parts and Special Tools List for Floodlight Set, Trailer Mounted High-Lite Corporation Model HLT-3K-5K-MIL Serial Numbers 6301A Thru 6909A (NSN 6230-01-056-5238) (This item is included on EM 0158) 30 September 1995

TM 10-3835-219-14 Operator, Unit, Direct Support, General Support Maintenance Manual for Hoseline Outfit, Fuel Handling 4-Inch Diameter (Model ADC-1200) (NSN 3835-00-892-5157) (Model 1461) (3835-01-261-6518) (This item is included on EM 0087) 27 April 1992

TM 10-3835-231-13 Operator's, Unit, and Direct Support Maintenance Manual for Tactical Petroleum Terminal Model TPT-1 (NSN 3835-01-288-4604) (This item is included on EM 0087) 5 April 1995

TM 10-4210-235-13 Operator's, Unit, and Direct Support, Maintenance Manual for Fire Suppression Equipment Set Model FSES-1 (NSN 4210-01-370-4912) (This item is included on EM 0137) 30 September 1994

TM 10-4320-307-10 Operator's Manual for Pumping Assembly (Mainline) Diesel Engine Driven, 800 GPM (NSN 4320-01-193-3430) 26 February 1993

TM 10-4320-310-14 Operator's, Unit, Direct Support and General Support Maintenance Manual, for Pump Unit, Flammable Liquid Centrifugal Self-Priming, 2-Inch, 100 GPM Diesel Engine Driven (NSN 4320-01-263-3604) (This item is included on EM 0087) 22 August 1991

TM 10-4320-343-14 Operator, Unit, Direct Support, and General Support Maintenance Manual for Fuel Pumping Assembly, Diesel Engine Driven, Wheel Mounted, 350 Gallons Per Minute (GPM), 275 Foot Head, Models: 350 PAF (NSN 4320-01-092-3551), LPP-TM (4320-01-215-7671), W-8646 (4320-01-246-4398), LC 350 GPM (4320-01-259-5965), and Fuel Pumping Assembly, Diesel Engine Driven, Wheel Mounted, 350 Gallons Per Minute (GPM), 275 Foot Head, With Regulator, Models: ADC 1500 (4320-01-141-5154) 350 PAFN (4320-01-437-3161) (This item is included on EM 0087) 30 July 1993

TM 10-4320-351-14 Operator's, Unit, Direct Support and General Support Maintenance Manual for Pumping Assembly for Advanced Aviation Forward Area Refueling System (AAFARS) (NSN 4320-01-434-4653) (This item is included on EM 0087) 1 March 1999

TM 10-4330-237-13&P Operator's, Unit and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for Filter-Separator, Water, Liquid Fuel for Advanced Aviation Forward Area Refueling System (AAFARS) Model 872FS-Z001 (NSN 4330-01-434-1824) (This item is included on EM 0087) 1 March 1999

TM 10-4930-204-13 Operator's, Organizational, and Direct Support Maintenance Manual for Tank and Pump Unit, Liquid Dispensing for Truck Mounting (United Manufacturing and Engineering Corp. Model Style 1) (NSN 4930-00-542-2800), (Model 2519) (4930-00-987-8576), (Model 2938) (4930-00-078-4939); (Bowser Inc. Model 36W50) (4930-00-078-4938), (Orr and Sembower Inc. Model BL-100) (4930-00-926-3692) and (Altech Inc. Model 4000) (4930-00-926-3581) (This item is included on EM 0087) 31 July 1980

TM 10-4930-229-12&P Operator and Unit Maintenance Manual (Including Repair Parts and Special Tools List) for Forward Area Refueling Equipment (FARE) (American Air Filter Model RFE 1000) (NSN 4930-00-133-3041) (This item is included on EM 0087) 26 September 1991

STP 10-92F15-SM-TG

TM 10-4930-232-12&P Operator and Unit Maintenance Manual (Including Repair Parts and Special Tools List) for Fuel System, Supply Point, Portable, 60,000 Gallon (NSN 4930-00-142-5313) (This item is included on EM 0087) 30 July 1993

TM 10-4930-236-13&P Operator's, Unit, and Direct Support Maintenance Manual and Repair Parts and Special Tools List for Tank And Pump Unit, Liquid Dispensing; for Truck Mounting Mil Design Tank and Pump Unit, Electric Motor Driven Model (97403) 13226E2150 (NSN 4930-01-274-0212) (This item is included on EM 0087) 30 August 1991

TM 10-4930-238-12&P Operator's and Unit Maintenance Manual (Including Repair Parts and Special Tools List) for Forward Area Refueling Equipment (NSN 4930-01-301-8201) (This item is included on EM 0087) 30 June 1993

TM 10-4930-247-13&P Operator's, Unit and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for HEMTT Tanker Aircraft Refueling System Model HTARS100 (NSN 4930-01-365-2771) and Model HTARS101 (4930-01-435-9019) (This item is included on EM 0038) 28 February 1994

TM 10-4930-250-13&P Operator's, Unit and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for Advanced Aviation Forward Area Refueling System (AAFARS) (NSN 4930-01-380-4856) (This item is included on EM 0087) 1 March 1999

TM 10-4930-351-14 Operator's, Unit, Direct Support and General Support Maintenance Manual for Advanced Aviation Forward Area Refueling System (AAFARS) Model M100A1 (NSN 4930-01-495-0024) (This item is included on EM 0087) 30 June 2004

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### Related Publications

Related publications are sources of additional information. They are not required in order to understand this publication.

#### Army Regulations

AR 200-1 Environmental Protection and Enhancement 21 February 1997  
 AR 710-2 Supply Policy Below the National Level 8 July 2005

#### Department of Army Forms

DA forms are available on the Army Electronic Library (AEL) and the APD web site, [www.apd.army.mil](http://www.apd.army.mil).

DA FORM 2028 Recommended Changes to Publications and Blank Forms  
 DA FORM 2404 Equipment Inspection and Maintenance Worksheet  
 DA FORM 4193 Petroleum Products Pump Station Hourly Operations Record  
 DA FORM 5164-R Hands-On Evaluation  
 DA FORM 5165-R Field Expedient Squad Book  
 DA FORM 5464-R Petroleum Products Pipeline Leakage Report  
 DA FORM 5988-E Equipment Inspection Maintenance Worksheet (EGA)

#### Department of Army Pamphlets

DA PAM 200-1 Handbook for Environmental Impact Analysis 17 January 2002  
 DA PAM 710-2-1 Using Unit Supply System (Manual Procedures) 31 December 1997  
 DA PAM 710-2-2 Supply Support Activity Supply System: Manual Procedures  
 30 September 1998  
 DA PAM 750-8 The Army Maintenance Management System (TAMMS) Users Manual  
 20 August 2005

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DD Forms are available from the OSD web site, [www.dior.whs.mil](http://www.dior.whs.mil).

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#### Field Manuals

FM 3-04.111 Aviation Brigades 21 August 2003  
 FM 3-11 Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical Defense Operations (This item is included on EM 0205)  
 10 March 2003  
 FM 3-100.4 Environmental Considerations in Military Operations 15 June 2000  
 FM 3-100.12 Risk Management for Multiservices Tactics, Techniques, and Procedures  
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FM 10-450-3 Multiservice Helicopter Sling Load: Basic Operations and Equipment  
10 April 1997

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Procedures 30 May 1998

FM 10-450-5 Multiservice Helicopter Sling Load: Dual-Point Rigging Procedures  
30 August 1999

FM 100-14 Risk Management 23 April 1998

**Other Product Types**

AMDF Army Master Data File

DOD 4140.25-M DOD Management of Bulk Petroleum Products, Natural Gas and Coal  
Volumes I - IV 1 June 1994

MIL-HDBK-200 Military Standardization Handbook: Quality Surveillance Handbook for  
Fuels, Lubricants, and Related Products 1 January 1996

MIL-HDBK-201 Petroleum Operations, 23 September 1971

MIL-HDBK-1022A Department of Defense Handbook Petroleum Fuel Facilities  
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MIL-STD-3004A Quality Surveillance for Fuels, Lubricants, and Related Products  
5 November 2003

OF FORM 346 US Government Motor Vehicle Operator's Identification Card

**Technical Manuals**

TM 5-3835-220-13&P Operator, Unit, and Intermediate Direct Support Maintenance Manual  
(Including Repair Parts and Special Tools List) for Tactical Petroleum  
Terminal Model WBEI-10002 (NSN 3835-01-182-1976) 18 June 1987

TM 5-4310-452-14 Operators, Organizational, Direct Support and General Support  
Maintenance Manual for Compressor, Rotary, Air, DED, 250 CFM 100  
psi Trailer-Mounted (NSN 4310-01-158-3262) Component of Pneumatic  
Tool and Compressor Outfit (3820-01-195-4167) (This item is included  
on EM 0150) 27 December 1990

TM 5-4320-305-10 Operator's Manual for Pump Unit, Centrifugal, Hoseline, 600 GPM, DED,  
Model US 612ACD-1 NSN 4320-01-193-3429 20 February 1987

TM 5-4330-217-12 Operator's and Organizational Maintenance Manual (Including Repair  
Parts and Special Tools List) for Filter Separator, Liquid Fuel, 100 GPM,  
Frame-Mounted (Keene Corp., Model 844-5-V-100AL) and (Velcon  
Filters, Inc., Model V-1520-ANZ) (Beta Systems, Model FS100-VM)  
(NSN 4330-00-491-4957) (This Item is Included on EM 0087)  
5 April 1973

TM 5-4930-237-10 Operator's Manual for HEMTT Tanker Aviation Refueling System  
(HTARS) (NSN 4930-01-269-2273) Model Number 50-0051 (This item is  
included on EM 0087) 10 March 1989

TM 5-6630-218-10 Operator's Manual for Aviation Fuel Contaminate Test Kit, (NSN 6630-  
01-008-5524) (This item is included on EM 0087) 23 May 1990

TM 9-2320-279-10-1 Operators Manual for M977 Series 8X8 Heavy Expanded Mobility  
Tactical Trucks (HEMTT), Truck, Cargo, With Winch, M977 (NSN 2320-  
01-097-0260) Truck, Cargo, With Winch, M977A2 (2320-01-493-3774)  
Truck, Cargo, With Winch, M977A2R1 (2320-01-493-3782) Truck, Cargo,  
Without Winch, M977 (2320-01-099-6426) Truck, Cargo, Without Winch,  
M977A2 (2320-01-493-3779) Truck, Cargo, Without Winch, M977A2R1  
(2320-01-493-3785) Truck, Tank, Fuel, With Winch, M978 (2320-01-097-  
0249) Truck, Tank, Fuel, With Winch, M978A2 (2320-01-492-8216)  
Truck, Tank, Fuel, With Winch, M978A2R1 (2320-01-492-8226) Truck,  
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	Without Winch, M978A2 (2320-01-492-8215) Truck, Tank, Fuel, Without Winch, M978A2R1 (2320-01-492-8225) Truck, Tractor, With Winch, Without Crane, M983 (2320-01-097-0247) Truck, Tractor, With Winch, Without Crane, M983A2 (2320-01-492-8223) Truck, Tractor, With Winch, Without Crane, M983A2R1 (2320-01-492-8231) Truck, Tractor, With Winch, With Crane, M983 (2320-01-099-6421) Truck, Wrecker-Recovery, M984 (2320-01-097-0248) Truck, Wrecker-Recovery, M984A1 (2320-01-195-7641) Truck, Wrecker-Recovery, M984A2 (2320-01-492-8224) Truck, Wrecker-Recovery, M984A2R1 (2320-01-492-8233) Truck, Cargo, With Winch, M985 (2320-01-097-0261) Truck, Cargo, With Winch, M985A2 (2320-01-492-8214) Truck, Cargo, With Winch, M985A2R1 (2320-01-493-3787) Truck, Cargo, Without Winch, M985 (2320-01-100-7673) Truck, Cargo, Without Winch, M985A2 (2320-01-492-8201) Truck, Cargo, Without Winch, M985A2R1 (2320-01-493-3789) Truck, Cargo, With Winch, M985E1 (2320-01-194-7032) Truck, Cargo, With Winch, M985E1A2 (2320-01-493-3790) Truck, Cargo, With Winch, M985E1A2R1 (2320-01-493-3792) (This item is included on EM 0038) 21 November 1986
TM 9-2320-361-10	Operator's Manual for 2-1/2-Ton, 6X6, M44A2 Series Trucks (Multifuel); Truck, Cargo: 2-1/2-Ton, 6X6, M35A2, M35A2C, M36A2, Truck, Tank, Fuel: 2-1/2-Ton, 6X6, M49A2C; Truck, Tank, Water: 2-1/2-Ton, 6X6, M50A2, M50A3; Truck, Van, Shop: 2-1/2-Ton, 6X6, M109A3; Truck, Instrument Repair Shop: 2-1/2-Ton, 6X6, M185A3; Truck, Tractor: 2-1/2-Ton, 6X6, M275A2; Truck, Dump: 2-1/2-Ton 6X6, M342A2; Truck, Maintenance, Pipeline Construction: 2-1/2-Ton, 6X6, M756A2; Truck, Maintenance, Earth Boring And Polesetting: 2-1/2-Ton, 6X6, M764 (This item is included on EM 0037) 15 December 1988
TM 9-2330-330-14&P	Operator's, Organizational, Direct Support, and General Support Maintenance Manual (Including Repair Parts and Special Tools List) for Semitrailer, Fuel Tanker: 5000-Gallon, Fuel-Dispensing, Automotive, M969A3 (NSN 2330-01-495-0043) 30 November 2005
TM 9-2330-272-14	Operator's, Organizational, Direct Support, and General Support Maintenance Manual for Semitrailer, Tank Fuel, 5000 Gallon, 4-Wheel, M131A4 (NSN 2330-00-994-9459) M131A5 (2330-00-226-6079); Semitrailer, Tank: Fuel Servicing, 5000 Gal., 4-Wheel, M131A4C (2330-00-894-9458) and M131A5C (2330-00-226-6080) (This item is included on EM 0049 & EM 0087) 30 June 1992
TM 9-2330-356-14	Operator's, Unit, Direct Support, and General Support Maintenance Manual for Semitrailer, Tank: 5000 Gallon, Bulk Haul, Self-Load/Unload M967 (NSN 2330-01-050-5632) M967A1 (2330-01-155-0046) Semitrailer, Tank: 5000 Gallon, Fuel Dispensing, Automotive M969 (2330-01-050-5634) M969A1 (2330-01-155-0048) Semitrailer, Tank: 5000 Gallon, Fuel Dispensing, Under/Overwing Aircraft M970 (2330-01-050-5635) M970A1 (2330-01-155-0047) (This item is included on EM 0049) 26 October 1990
TM 9-2330-398-10	Operator's Manual for Semitrailer, Tank, 5000-Gallon, Fuel Dispensing, Automotive M969A2 (NSN 2330-01-377-9337) (This item is included on EM 0049 & EM 0087) 15 June 1996
TM 10-3835-219-14	Operator, Unit, Direct Support, General Support Maintenance Manual for Hoseline Outfit, Fuel Handling 4-Inch Diameter (Model ADC-1200) (NSN 3835-00-892-5157) (Model 1461) (3835-01-261-6518) (This item is included on EM 0087) 27 April 1992
TM 10-4210-235-13	Operator's, Unit, and Direct Support, Maintenance Manual for Fire Suppression Equipment Set Model FSES-1 (NSN 4210-01-370-4912) (This item is included on EM 0137) 30 September 1994

- TM 10-4320-307-10 Operator's Manual for Pumping Assembly (Mainline) Diesel Engine Driven, 800 GPM (NSN 4320-01-193-3430) 26 February 1993
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- TM 10-4320-343-14 Operator, Unit, Direct Support, and General Support Maintenance Manual for Fuel Pumping Assembly, Diesel Engine Driven, Wheel Mounted, 350 Gallons Per Minute (GPM), 275 Foot Head, Models: 350 PAF (NSN 4320-01-092-3551), LPP-TM (4320-01-215-7671), W-8646 (4320-01-246-4398), LC 350 GPM (4320-01-259-5965), and Fuel Pumping Assembly, Diesel Engine Driven, Wheel Mounted, 350 Gallons Per Minute (GPM), 275 Foot Head, With Regulator, Models: ADC 1500 (4320-01-141-5154) 350 PAFN (4320-01-437-3161) (This item is included on EM 0087) 30 July 1993
- TM 10-4320-351-14 Operator's, Unit, Direct Support and General Support Maintenance Manual for Pumping Assembly for Advanced Aviation Forward Area Refueling System (AAFARS) (NSN 4320-01-434-4653) (This item is included on EM 0087) 1 March 1999
- TM 10-4330-237-13&P Operator's, Unit and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for Filter-Separator, Water, Liquid Fuel for Advanced Aviation Forward Area Refueling System (AAFARS) Model 872FS-Z001 (NSN 4330-01-434-1824) (This item is included on EM 0087) 1 March 1999
- TM 10-4930-204-13 Operator's, Organizational, and Direct Support Maintenance Manual for Tank and Pump Unit, Liquid Dispensing for Truck Mounting (United Manufacturing and Engineering Corp. Model Style 1) (NSN 4930-00-542-2800), (Model 2519) (4930-00-987-8576), (Model 2938) (4930-00-078-4939); (Bowser Inc. Model 36W50) (4930-00-078-4938), (Orr and Sembower Inc. Model BL-100) (4930-00-926-3692) and (Altech Inc. Model 4000) (4930-00-926-3581) (This item is included on EM 0087) 31 July 1980
- TM 10-4930-229-12&P Operator and Unit Maintenance Manual (Including Repair Parts and Special Tools List) for Forward Area Refueling Equipment (FARE) (American Air Filter Model RFE 1000) (NSN 4930-00-133-3041) (This item is included on EM 0087) 26 September 1991
- TM 10-4930-232-12&P Operator and Unit Maintenance Manual (Including Repair Parts and Special Tools List) for Fuel System, Supply Point, Portable, 60,000 Gallon (NSN 4930-00-142-5313) (This item is included on EM 0087) 30 July 1993
- TM 10-4930-236-13&P Operator's, Unit, and Direct Support Maintenance Manual and Repair Parts and Special Tools List for Tank And Pump Unit, Liquid Dispensing; for Truck Mounting Mil Design Tank and Pump Unit, Electric Motor Driven Model (97403) 13226E2150 (NSN 4930-01-274-0212) (This item is included on EM 0087) 30 August 1991
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- TM 10-4930-250-13&P Operator's, Unit and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for Advanced Aviation Forward Area Refueling System (AAFARS) (NSN 4930-01-380-4856) (This item is included on EM 0087) 1 March 1999

TM 10-6630-247-13&P	Operator's, Unit and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for Ground Fuels Petroleum Test Kit Model PTK-200 (NSN 6630-00-310-8564) (This item is included on EM 0087) 18 January 1994
TM 10-8110-201-14&P	Operator, Organizational, Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools List) for Drums, Fabric, Collapsible, Non-Vented, 500 Gallon, Liquid Fuel, Part No. 13216E9172 (NSN 8110-00-753-4892); 500 Gallon, Liquid Fuel, Part No. 13216E9170 (8110-00-824-1444); Kit, Tiedown (8110-00-856-6245) Repair Kit, Emergency, Type I (8811-00-856-6244) Repair Kit, Emergency, Type II (8811-00-856-6246) Towing And Lifting Yoke (8110-00-856-6243) (This item is included on EM 0077 AND 0087) 10 February 1983
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STP 10-92F15-SM-TG  
31 May 2006

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