

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD		No. ES-MECH-014, Rev. 0 Page 1 of 7
Subject: REFUELING AND RECHARGING VEHICLES AND EQUIPMENT	Effective Date: October 31, 2014	Initiated: M. Viola Head, Facilities and Site Services	
	Supersedes: New	Approved: M. Williams Associate Laboratory Director for Engineering & Infrastructure	

1.0 Applicability: This procedure describes the responsibilities and actions to be implemented by all vehicle operators engaged in refueling or recharging batteries for vehicles and equipment on the PPPL campus.

2.0 Introduction:

Additional requirements for subcontractors refueling equipment on site can be found in ES-MECH-011, Special Purpose Vehicles and Equipment, Chapter 7. Princeton Technical Representatives (PTR's) are responsible for ensuring subcontractors are aware of all PPPL requirements of this Engineering Standard.

A. Refueling E85, Gasoline, B20 or Diesel for PPPL Vehicles/Equipment at FUELFORCE Station:

The PPPL fuel Island dispenser is a microprocessor-based fuel control and data acquisition system. Fuel is available around the clock by accessing the system with an assigned key fob that contains encoded information for the vehicle or equipment. Vehicle and equipment operators need a four digit Employee Personal Identification Number (PIN) in order to obtain fuel for PPPL owned U.S. Gov't Personal Property (USGPP).

To obtain fuel, an authorized user swipes the key fob (attached to the vehicle or equipment keys) at the fuel dispenser control panel. The system will request the following information: Vehicle mileage or equipment hours, Employee PIN number fuel hose # (1-diesel, 2-gasoline, 3-B20, 4-E85). If the information is correct, the system will activate the associated pump and fuel type and indicates individual can start the fueling process. When refueling is completed and the user places the pump nozzle in its holder, the system records the information and ends the session.

B. Replacing LPG Tanks:

LPG Fuel tanks for vehicles shall be stored in area(s) designated by Material Services that meet all OSHA and DOT requirements. Full and empty tanks shall be stored apart.

Leaking tanks must be reported to ESU immediately –x3333.

C. Charging Batteries:

Charging batteries can produce explosive gases requiring the area where fixed charging stations are to have good ventilation to dissipate the gases. Facilities for quick drenching of the eyes and body shall be provided within 10 seconds of battery charging areas. The charging areas shall have the ability to provide a neutralizing agent for spilled electrolyte and shall have fire protection. Chargers shall be protected from damage by vehicles or equipment.

For all equipment/vehicles that has an onboard charger and does not use a fixed charging location, the site used for charging batteries shall be well ventilated and have fire protection.

Battery fluids are corrosive and all spills or leaks must be cleaned immediately.

3.0 Reference Documents:

ANSI/NFPA 30 Flammable and Combustible Liquids Code

ANSI/NFPA 58 Liquefied Petroleum Gas Code

ANSI/NFPA 505 Fire Safety Standard for Powered Industrial Trucks

UL 558 Industrial Trucks, Internal Combustion Engine Powered

UL 583 Electric Battery Powered Industrial Trucks

OSHA 29 CFR 1910 Occupational Safety and Health Standards

OSHA 29 CFR 1926 Safety and Health Regulations for Construction

Material Services Branch Policies and Procedures Manual

4.0 Refueling PPPL Vehicles/Equipment with Alternative Fuel and Regular Fuel:**A. At FUELFORCE Station:**

<u>Responsibility</u>	<u>Action</u>
Vehicle/Equipment Operator	<ol style="list-style-type: none">1. Positions vehicle or Equipment adjacent to the fuel dispensing island. Set parking brake, lowers arms or booms (if any). Notes odometer or hour reading.2. Switches off engine. Removes ignition key.3. Verifies that no one is sitting on the equipment during refueling procedures.4. Verifies there is no smoking, open flame, sparks or electric arcs in the fueling area.5. Swipes the key fob attached to the ignition keys at the control panel fuel dispenser.6. Using the key pad enters odometer reading or meter hours for vehicle or equipment.7. Enters employee personal identification number (PIN).8. The LCD displays: SELECT Hose number PUMP. Enters the desired pump number (1-DIESEL, 2-GASOLINE, 3-E85, 4-B20) on the keypad presses ENTER.9. The LCD displays: SELECT Hose number PUMP. Enters the desired pump number (1-diesel, 2-gasoline, 3-B20, 4-E85) on the keypad presses ENTER. If the pump selected is incorrect you will get an invalid message and need to restart again at step 5. If the pump is available and operator is authorized, the LCD will display, "Okay, begin fueling".10. Removes nozzle from pump and turns dispenser handle.11. Inserts nozzle into refueling probe in vehicle or equipment.12. Squeezes trigger on nozzle until the desired amount of fuel is put in tank. Do not top off vehicle.13. Turns off pump handle when finished fueling, makes sure the nozzle has completely drained before returning to its holder. The transaction information is automatically recorded in the system's memory for later recall.14. Spilled fuel on equipment or vehicle, must be cleaned prior to returning to service.15. Operator may shut system down manually anytime using the emergency stop button located on the yellow pole between the two fuel pumps. Additional emergency stop buttons are located on the well house adjacent to the fuel island and on the Gas Cylinder Storage Building.

Fleet Management Technician 16. If the emergency stop button is activated, it will need to be reset only by authorized Fleet Management Technician or other authorized personnel who are trained.

B. Procedure for fueling PPPL vehicles/equipment in the field:

In order to avoid the potential for Spill Control requirements, PPPL equipment operators should always be aware of their fuel levels and attempt to refuel their vehicles and equipment at the FUELFORCE Station prior to running out of fuel.

In addition to the requirements above, fueling in the field also requires:

<u>Responsibility</u>	<u>Action</u>
Vehicle Operator	<ol style="list-style-type: none"> 1. Refueling should be conducted on impervious surfaces. 2. Performed only with proper equipment and fire protection. 3. Proper equipment for absorbing spilled fuel must be immediately available. 4. Fueling area shall be well ventilated. 5. Spilled fuel on equipment and vehicle must be cleaned prior to returning to service.

C. Procedure for fueling subcontractor vehicles/equipment in the field:

Information and Spill Prevention Control and Countermeasures (SPCC) requirements for refueling subcontractor equipment (not allowed at PPPL Dispensing Island) may be found in Engineering Standard ES-MECH-011, Special Purpose Vehicles and Equipment, Chapter 7, Section 8.

NOTIFY ESU IMMEDIATELY IF SPILL OCCURS - X3333

5.0. LPG Tank Replacement:

Note: Dual fuel, Gasoline/LPG, vehicles/equipment must have at least a ¼ full tank of Gasoline, if on LPG (NFPA 505).

Responsibility**Action**

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| Vehicle Operator | <ol style="list-style-type: none">1. Verifies that fueling area is well ventilated and equipped with adequate fire protection.2. Parks equipment, sets brake, lowers arms or booms, turns equipment off and removes key.3. Verifies there is no smoking, open flame, sparks or electric arcs in the fueling area.4. Proper PPE shall be worn when changing LPG tanks.5. Closes valve to LPG tank before removing.6. Removes empty LPG tank from equipment.7. Brings secured empty LPG tank to Material Services designated site to exchange for a full LPG tank. Tanks must be secured if within a vehicle.8. Installs full LPG tank on equipment, obtains help lifting LPG tank, if necessary.9. Secures full LPG tank for safe transport, tanks must be secured if within a vehicle.10. Opens valve and checks connections for leaks prior to placing equipment back into service.11. Resumes equipment duties.12. Verifies that no one is sitting on the equipment during refueling procedures. |
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NOTIFY ESU IMMEDIATELY IF LEAK OCCURS - X3333

6.0 Battery Charging:**A. Battery Charging for Vehicle/Equipment with External Chargers:**

<u>Responsibility</u>	<u>Action</u>
Vehicle Operator	<ol style="list-style-type: none">1. Verifies charging area is well ventilated and is equipped with eyewash facilities and adequate fire protection.2. Parks equipment, sets brake, lowers arms or booms, turns equipment off and removes key.3. Verifies there is no smoking, open flame, sparks or electric arcs in the charging area.4. Wears proper personal protective equipment.5. Ensures that vent caps are in place and the battery compartment cover is open to dissipate heat.6. Recharges equipment batteries only when battery has been effectively discharged. Recharging when only partially discharged will decrease battery life.7. Disconnects battery from equipment.8. Removes any tools and metallic objects from the tops of uncovered batteries.9. Inspects battery for wetness, corrosion and dirt.10. Checks battery fluid levels, adds water as necessary.11. Inspects connectors for welded contacts.12. Verifies charger is turned off.13. Connects battery to battery charger. (Never connects battery charger to equipment directly)14. Sets battery charger to normal charge. Based on manufacturer's recommender frequency (often monthly), set battery charger to equalizing charge.15. Turns on battery charger.16. When charging is complete, turns off battery charger, if not automatic.17. Unplugs battery from battery charger, stores battery charger connection safely.18. Inspects battery for wetness and corrosion and that vent caps are tight.19. Verifies that battery is properly positioned and secured in the vehicle.20. Connects battery to equipment.21. Closes battery compartment and secures.

NOTIFY ESU IMMEDIATELY IF SPILL OCCURS - X3333

B. Battery Charging for Vehicle/Equipment with Onboard Chargers:**Responsibility****Action**

Vehicle Operator

1. Verifies charging area is well ventilated and is equipped with eyewash facilities and adequate fire protection.
2. Parks equipment, sets brake, lowers arms or booms, turns equipment off and removes key.
3. Verifies there is no smoking, open flame, sparks or electric arcs in the fueling area.
4. Wears proper personal protective equipment.
5. Opens battery compartment, ensures that vent caps are in place and the battery compartment cover remains open to dissipate heat.
6. Recharges equipment batteries only when battery has been effectively discharged. Recharging when only partially discharged will decrease battery life.
7. Inspects battery for wetness, corrosion and dirt.
8. Removes any tools and metallic objects from the tops of uncovered batteries.
9. Checks battery fluid levels, adds water as necessary.
10. Inspects connectors for welded contacts.
11. Verifies charger is turned off.
12. Removes AC power cable from storage and connects battery charger AC power cable to a properly grounded receptacle.
13. Sets battery charger to normal charge. Based on manufacturer's recommender frequency (often monthly), set battery charger to equalizing charge.
14. Turns on battery charger.
15. When charging is complete, turns off battery charger if not automatic, unplugs AC power cord and stores cable properly.
16. Inspects battery for wetness and corrosion and that vent caps are tight.
17. Closes battery compartment and secures.
18. If restoring battery electrolyte is required, inform Equipment Contact/Custodian for required maintenance of vehicle.
19. The use of an extension cord for recharging batteries is only allowed in construction areas.

NOTIFY ESU IMMEDIATELY IF SPILL OCCURS - X3333