



Company Name: _____

Employee Name: _____

Date of Hire _____

Supervisor: _____

Initial Training Recurrent Training

DATE INITIALS (Supervisor)

Viewed Fuel Storage Systems Module

Passed Examination on Fuel Storage Systems module

Has received hands-on training, demonstrates proficiency, and can discuss the following:

Fuel Transfer to and From Storage Tanks

Fuel storage facilities should be located away from buildings, aircraft and hangars and have the following:

Be secured with restricted access to authorized personnel

Have flammable signage prominently displayed

Each storage tank separated and designated by product type and must not be intermingled

Understands that fuel storage systems can vary in design, capacity and operating features (self-serve storage, self-contained pump skids, supply fuel via hydrant system, tanks can be above ground, or below ground). Understands all types used at FBO

Understands and can demonstrate proper procedures for receiving fuel into all storage systems utilized

Fuel is delivered to an airport fuel storage facility by either a pipeline or by transport truck

Fuel delivered by either transport truck or pipeline **must** undergo preliminary QC checks before being accepted or off-loaded into airport storage (API gravity, white bucket)

Transport truck must be bonded to fuel storage system before hose connections are made

Understands and can demonstrate proper procedures for loading all mobile equipment used

Can identify and discuss the following fuel storage components:

Butterfly valves

Basket strainer

Product transfer pump

- Filter vessel
- Piping (inlet & outlet)
- High-level shutoff
- Storage tank
- Floating suction
- Product meter
- Deadman valve
- Delivery hose
- Nozzle

Fuel Storage System Components, Safety Features and Inspection Procedures

Understands the importance of regular system maintenance (pumps, motors, swivels etc., to be maintained per manufacturer's instructions at recommended maintenance intervals), thorough record keeping and how to perform the following inspections at their designated frequency:

Daily Inspections

- General Condition of Tank Yard (tank yard clean, landscaping well groomed and free of potential fire hazards like weeds, trash and grass clippings)
- Security, Fire & Safety Deficiencies (gates, fences, electrical boxes/panels, access doors are locked and secured and in good working order; eyewash stations serviceable)
- Fire Extinguisher(s) (ensures visible and unobstructed for ease of use with seals intact and no evidence of low charge; knows to remove deficient extinguisher from service)
- Sump Filter Vessel (can properly perform, rate and record a sump sample with the vessel under pressure)
- Differential Pressure (records reading under maximum flow conditions for comparison to previous days and trend analysis; understands what a rise or drop in DP can indicate and what "corrected" DP is)
- Ground Reels, Cables and Clamps (checks grounding reels, cables and clamps for damage, tightness and corrosion; checks integrity of connection to grounding rod; repair/replace defective equipment promptly)

- Hoses (per API guidelines-inspects condition looking for cracking, abrasions, cuts, soft spots, blisters, chaffing, twists, sharp ends or other irregularities; knows that API and NFPA 407 recommend hose service life not to exceed 10 years)
- Swivels (inspects for proper tightness and movement noting any damage or defective parts)
- Nozzles (inspects single point/underwing for nicks and cracks on the nose seal, ensures overwing nozzles are in place, flared spout for jet and smaller round for avgas, along with avgas bottom loading nozzle(s) checking all for excessive wear, sharp edges, loose components, ensuring dust covers are used)
- Nozzle Fueling Pressure-PSI (records nozzle pressure on fuel transfers from storage directly into aircraft, if storage system is utilized for into-plane fueling, to ensure fuel storage system is working properly)
- Storage Tank Sump (can properly perform, rate and record a tank sump sample from all low points)
- Fuel Leaks (checks for visible drips or evidence of staining around couplers, flanges, joints, connection points, piping, valves, pumps, nozzles, filter vessels and hoses reporting them for repair)
- Surge/Relaxation Tank Sump (safety device found on systems that pump over 200 gpm to help minimize static accumulation that can occur at higher flow rates; sump the vessel discarding any visible contaminants)
- Deadman Control(s) (safety feature required by the NFPA on systems that transfer fuel from a storage facility into a mobile refueler or directly into aircraft; they must **never** be defeated; user must check to ensure proper function- when the deadman is released the flow of fuel must cease within 5 % of system's rated flow)
- Sump Saver (vessel allowing 95% recovery of sump samples by retaining the sample and allowing water or particulates to settle out and be removed before fuel is filtered and returned to storage for later use)
- Waste Fuel Tanks (must be labeled properly including the type of waste fuel contained inside and be disposed of in accordance with all local, state and federal requirements; liquid level must be gauged daily and disposed of as needed to prevent overflow)
- Spill Kit (checks to make sure kit is provisioned with a full complement of absorbent materials to contain and clean a fuel spill)
- Monthly Inspections

- Signs & Placards (Flammable and No Smoking signs visible all 4 sides of their perimeter and entrance to facility meeting NFPA 407 height and color requirements; product identification on all 4 sides of tank meeting API 1541 standard color coding and banding requirements; DOT placards 1863 & 1203 on all 4 sides; Emergency Contact information and FBO contact information posted)
- Filter Membrane [Millipore] Free Water Test [PPM] (run monthly downstream of the filter vessel to check filter element condition and effluent water content in turbine fuel)
- Fire Extinguisher(s) (checks to see fire extinguisher are B:C rated, tag dates are current, properly charged with seals and pins in place and secured)
- Bond/Ground Cable Continuity (test conductivity of ground reels, cables, clamps and grounding rods with a volt/ohm meter; continuity between these components and pumping skid not to exceed 25 ohms)
- Fuel Hose(s) (pulls hose its full length off the reel and inspects it under pressure for cracking, abrasions, cuts, soft spots, blisters, chaffing, twists, sharp ends or other irregularities; checks coupling indicator for slippage)
- Nozzle Screens (inspects and cleans 100 micron mesh screens; can identify contaminants and their probable source, example rubber pieces could be from hose lining, seals, gaskets, etc.)
- Interstitial Check(s) (inspects for signs of leaks on double-wall tanks)
- Water Indicating Paste Test (tests tank bottoms via gauging stick for signs of water accumulation and to verify accuracy of electronic water monitoring systems, if equipped)
- Meter Seal(s) (if equipped and used for resale, ensures calibration tag is current and meter seals are intact)
- FSII Level % in Pre-Blend Tanks (performs B/2 test on tanks pre-blended with anti-icing additive and can interpret and record results)
- Floating Suction(s) (standard on Jet-A tanks but also used on some 100LL tanks they are designed to prevent potentially suspended contaminants from being transferred to a mobile refueler or directly into an aircraft; should be equipped with a mechanical means for functional testing-typically a cable fixed to the floating suction)
- Quarterly Inspections
 - Water Defense System(s) (shuts down the pumping system when they encounter a slug of water; Float operated type with external mechanical test feature are tested by depressing plunger to simulate a slug of water to verify that fuel flow ceases)

- Emergency Fuel Shutdown (safety feature on all fuel storage systems in case of a spill or fire; NFPA requires an additional remote shutoff a minimum of 20' but no more than 100' from the fuel transfer area; check to ensure accessibility, signage is properly displayed/visible per NFPA requirements and that shutoff system functions properly)
- Tank High Level Alarm/Controls (used to prevent fuel spills from overflowing a tank; alarm typically sounds at 90% of tank capacity and pump(s) shut down at 95% of tank capacity; most systems have a test feature that can verify operation prior to offloading a transport; test quarterly by starting pumping system and activating high level control-always follow manufacturer's guidelines for testing)
- Annual Inspections
 - Fire Extinguisher(s) (has licensed contractor certify and tag fire extinguishers for use)
 - Filter Elements (are to be changed annually per manufacturer's recommendation and vessel's interior inspected)
 - Pressure & Differential Pressure Gauge(s) (verifies the accuracy of all gauges via certified/calibrated gauge; defective gauges repaired or replaced immediately; DP gauge filters replaced per manufacturer's recommendations)
 - Water Defense System(s) (must be tested by injecting water to ensure functionality using manufacturer guidelines-typically performed just prior to annual filter change out)
 - Filter/Separator Sump Heater(s) (warm low point sump areas and prevent freezing so water and contaminants can be removed daily; not used in 100LL vessels; should be off when temperature is above freezing and must be inspected; usually thermostat is set to 40 degrees and verified by using a thermo hydrometer to test the temperature of fuel coming from the lowpoint)
 - Storage Tank Interior(s) (visually inspects tank interior by removal of covers to look for dirt and tank lining defects using a hand-held mirror; all jet -a tanks should be epoxy lined; flaking/deteriorating lining requires tanks be cleaned and epoxy lining repaired promptly)
 - Cathodic Protection (designed to protect underground steel tanks and piping from corrosion; if equipped, must be tested by an outside contractor specializing in these systems)
 - Meter Calibration-Resale (accuracy is checked by calibration)
 - Tank Vent(s) (allows air to exit or enter during fuel transfer into or out of storage; Jet-A tanks typically have a screen and need to be checked for cleanliness, obstructions and tears; Avgas tanks typically have a pressure poppet which must be checked for proper operation)



Line Strainer(s) (inhibits larger solid contaminants from entering the pump and causing damage to filters; remove strainer screen and inspect and clean or replace as necessary)

Remarks: _____
