1. MAINTENANCE TABLE

Inspection and maintenance tasks listed below are the minimum required. Additional operation and maintenance tasks may be performed based on specific installation requirements set by facility command.

OM stands for Operator Maintenance, and SM stands for System Maintenance. See [Section 1-2](#ROLES_AND_RESPONSIBILITIES) for more information on roles and responsibilities.

| **ITEM** | **PARAGRAPH** | **FREQUENCY** | **Army** | **Navy/ USMC** | **Air Force** |
| --- | --- | --- | --- | --- | --- |
| **SIGNAGE AND MARKINGS** |
| Signage and Markings (Section 2-7) |
| Signage and Markings | 1. Check permanent signs and markings for adequacy and readability. Repair or replace deteriorated or illegible signs and markings.
2. Inspect the location of Department of Transportation (DOT) regulated underground pipelines and ensure they are marked in accordance with 49 Code of Federal Regulations (CFR) 195.410.
3. Check that all non-DOT regulated pipelines, tanks, valves, pumps, meters, and other equipment are marked in accordance with UFC 3-460-01. Section \**1**\2-17 /**1**/. If markings are missing or insufficient, repair or add markings in accordance with UFC 3-460-01.
4. Ensure petroleum fuel system Emergency Fuel Shutoff (EFSO) push buttons are properly identified at each location. Ensure that signage is properly secured and that the lettering is legible from 25 feet (7.5 meters) away and not faded.
 | Monthly | OM | OM | OM |
| 1. Verify enough movable or temporary signs are maintained in good condition to serve anticipated needs; for example: "DANGER," "CLOSED TO TRAFFIC," “KEEP FLAMES AWAY," "MEN WORKING,” "NO SMOKING,” "DANGER NO OPEN FLAME OR IGNITION SOURCE BEYOND THIS POINT.” Use bilingual signs when appropriate.
 | Annually | OM | OM | OM |
| **FILTRATION** |
| Pre-Filter Vessels (Section 3-6.1) |
| Pre-Filter Vessels | 1. Open drains under flow conditions until clear fuel is observed from the drain valve.
2. Monitor differential pressure in filter cartridges. Chart differential pressure measurements from readings taken during normal operations.
 | Daily | OM | OM | OM |
| 1. Operate pre-filter isolation valves.
 | Quarterly  | SM | \**2**\ OM /**2**/ | SM |
| 1. Replace filter cartridges when the acceptable maximum differential pressure is reached, the maximum in-service duration has passed, or the fuel becomes visibly dirty or discolored. Acceptable maximum differential pressure for a specific pre-filter is dependent on the system flow rate. The military service-specific SCP may extend in-service duration filter cartridge replacement period based on differential pressure for high throughput systems. Check expiration date of replacement filter cartridges before installation.
 | When differential pressure has reached the lower of manufacturer’s recommendation or 20 psid (140 kPa), filter cartridge in-service period of 24 months has expired, or when fuel becomes visibly dirty or discolored. | SM | SM | SM |
| 1. Refer to [Section 6-7.2 Differential Pressure Gauges](#Differential_Pressure_Gauges) for inspection and maintenance requirements of differential pressure gauges.
2. Refer to [Section 3-10.2 Automatic Air Vents](#Automatic_Air_Vents) for inspection and maintenance requirements of automatic air vents.
3. Refer to [Section 6-6.3 Thermal and Pressure Relief Valves](#Thermal_and_Pressure_Relief_Valves) for inspection and maintenance requirements of thermal and pressure relief valves.
4. Conduct inspections of code rated vessels that meet the requirements of UFC 3-430-07
 | As required | SM | SM | SM |
| Filter Separators (Section 3-6.2) |
| Filter Separators | 1. Open drain under flow conditions until clear fuel is observed from the drain valve.
2. Monitor differential pressure of coalescer cartridges. The acceptable maximum differential pressure for a specific filter/separator is dependent on the system flow rate. Monitor and chart differential pressure measurements of filter separators from readings taken during normal operations. Investigate sudden drops or spikes in differential pressure measurement readings.
 | Daily | OM | OM | OM |
| 1. Operate filter separator isolation valves.
2. Inspect components and check operation of water shutoff system.
 | Quarterly | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ | SM |
| 1. Change coalescer cartridges. Refer to [Section 3-6.2.2 Replacement of Coalescer Cartridges](#Replacement_of_Filter_Cartridges) for general instructions on replacement of coalescer cartridges. Military service-specific SCP may extend the coalescer cartridge replacement frequency based on differential pressure if filters separators are used on high throughput systems. Check expiration date of replacement coalescer cartridges before installation.
2. Inspect and clean separator cartridges at time of coalescer cartridge change in accordance with [Section 3-6.2.3 Separator Cleaning](#Filter_Separator_Coalescer_Cleaning). Worn or damaged separator cartridges must be replaced.
 | Every 36 months or sooner if required by differential pressure. | SM | SM | SM |
| 1. Refer to [Section 6-7.2 Differential Pressure Gauges](#Differential_Pressure_Gauges) for inspection and maintenance requirements of differential pressure gauges.
2. Refer to [Section 3-10.2 Automatic Air Vents](#Automatic_Air_Vents) for inspection and maintenance requirements of automatic air vents.
3. Refer to [Section 6-6.3 Thermal and Pressure Relief Valves](#Thermal_and_Pressure_Relief_Valves) for inspection and maintenance requirements of thermal and pressure relief valves.
4. Refer to [Section 4-4.2.2 Filter Separator Control Valves](#Filter_Separator_Control_Valves) for inspection and maintenance requirements of filter separator control valves.
5. Conduct inspections of code rated vessels that meet the requirements of UFC 3-430-07*.*
 | As required | SM | SM | SM |
| \**2**\ Haypack Filters (Section 3-6.3) |
|  | 1. Refer to manufacturer's operation and maintenance manual for inspection and maintenance requirements of haypack filters.
 | Per manufacturer's specifications | SM | SM | SM |
| 1. Refer to Section 2-6.4, Waste Disposal, for disposal requirements.
 | As required | SM | SM | SM /**2**/ |
| Basket Strainers (3-6.4) |
| Basket Strainers | 1. Monitor and chart differential pressure measurements of basket strainers from readings taken during normal operations. Investigate sudden drops or spikes in differential pressure measurement reading.
 | Daily | OM | OM | OM |
|  | 1. Clean and inspect basket and strainer screen. Basket strainer isolation valves must be closed and the strainer body must be drained before removing the cover. After cleaning, the strainer screen must be inserted in the strainer body, and the head tightened and checked for leakage. If strainer is not equipped with means to measure differential pressure, unit must be opened monthly and inspection.
 | Semi-annually if basket strainer is equipped with means to measure differential pressure; otherwise monthly.  | OM | OM | OM |
|  | 1. Refer to [Section 6-7.2 Differential Pressure Gauges](#Differential_Pressure_Gauges) for inspection and maintenance requirements of differential pressure gauges.
 | As required | SM | SM | SM |
| Filter Separator Sump Heaters (Section 3-6.5) |
| Filter Separator Sump Heaters | 1. Inspect filter separator sump and drain line heater elements for proper operation per manufacturer’s operation and maintenance manual. Ensure heater elements meet manufacturer’s requirements by measuring resistance of heater elements with an ohm meter.
 | Semi-annually | SM | SM | SM |
| **METERS** |
| Positive Displacement Meters (Section 3-7.1) |
| Positive Displacement Meters | 1. Inspect counter head for unusual noises and smooth operation.
 | Monthly | OM | OM | OM |
| 1. Positive displacement meters must be inspected and calibrated semi-annually or when improper performance is suspected; when unusual sounds or register actions develop; or after repairs have been made which may affect performance. Positive displacement meters are satisfactory when the measurement error in the normal flow direction is within ±0.3% of actual quantity delivered (e.g., ±1.8 gallons for a 600-gallon test (±6.8 liters for a 2275-liter test)). Adjustment of the meter’s register will be in accordance with manufacturer’s instructions. Identify the next calibration date on meters (example: Mar 14 for March 2014). Use weather resistant label that will remain legible and affixed for at least one year.
2. Inspect temperature element operation of meters equipped with temperature compensation feature per manufacturer’s operation and maintenance manual.
 | Semi-annually or as required | SM | SM | SM |
| Turbine Flow Meters (Section 3-7.2) |
| Turbine Flow Meters | 1. Turbine flow meters must be inspected and calibrated semi-annually or when improper performance is suspected, register actions develop, or after repairs have been made which may affect performance. Turbine flow meters are satisfactory when the measurement error in the normal flow direction is within ±0.5% of actual quantity delivered (e.g., ±3 gallons for a 600-gallon test (±11 liters for a 2275-liter test)). Adjustment of the meter’s register will be in accordance with the manufacturer’s instructions. Identify the next calibration date on meters (example: Mar 14 for March 2014). Use weather resistant label that will remain legible and affixed for at least one year.
2. Inspect temperature element operation of meters equipped with temperature compensation feature per manufacturer’s operation and maintenance manual.
 | Semi-annually or as required | SM | SM | SM |
| Orifice Flow Meters (Section 3-7.3) |
| Orifice Flow Meters | 1. Refer to [Section 6-7.2 Differential Pressure Gauges](#Differential_Pressure_Gauges) for inspection and maintenance requirements of differential pressure gauges.
2. Refer to [Section 6-7.4 Differential Pressure Transmitters](#Differential_Pressure_Transmitters) for inspection and maintenance requirements of differential pressure transmitters.
 | As required | SM | SM | SM |
| **PUMPS** |
| Centrifugal Pumps (Section 3-8.1) |
| Centrifugal Pumps | 1. Check for proper operations while pump is in use. Check suction and discharge pressure gauge for abnormal readings.
2. Check for unusual noise, vibration, overheating of bearings or case.
3. If equipped with lubricating oil charge, check oil level and adjust as necessary.
4. Tighten or replace loose, missing or damaged nuts, bolts, or screws.
5. Inspect suction and discharge isolation dampeners for misalignment and wear
6. Inspect mechanical seals, if possible, for proper operating temperature, drips, leaks and dirt.
 | Quarterly | SM | SM | SM |
| 1. Check alignment, clearances, and rotation of shaft and coupler (requires removal of coupler shroud or cover).
2. Lubricate pump bearings.
3. If equipped with lubricating oil charge, drain old oil, and fill with new to full mark on sight indicator (also fill bulb).
 | Annually | SM | SM | SM |
| 1. Refer to [Section 9-1.7 Electric Motors](#Electric_Motors) for inspection and maintenance requirements of electric motors.
 | As required | SM | SM | SM |
| Vertical Inline Pumps (Section 3-8.1.2) |
| Vertical Inline Pumps | 1. Check for proper operations while pump is in use. Check suction and discharge pressure gauges for abnormal readings.
2. Check for unusual noise, vibration, overheating of bearings.
3. Tighten or replace loose, missing or damaged nuts, bolts, or screws.
4. Inspect suction and discharge isolation dampeners for misalignment and wear.
5. Inspect mechanical seals, if possible, for proper operating temperature, drips, leaks and dirt.
 | Quarterly | SM | SM | SM |
| 1. Check alignment, clearances, and rotation of shaft and coupler (requires removal of coupler shroud or cover).
2. Lubricate pump bearings.
 | Annually | SM | SM | SM |
| 1. Refer to [Section 9-1.7 Electric Motors](#Electric_Motors) for inspection and maintenance requirements of electric motors.
 | As required | SM | SM | SM |
| Vertical Turbine/Submerged Turbine Pumps (Section 3-8.1.3) |
| Vertical Turbine/Sub-merged Turbine Pumps | 1. Check for proper operations while pump is in use. Check discharge pressure gauge for abnormal readings.
2. Check for unusual noise, vibration, overheating of bearings or case.
3. If equipped with lubricating oil charge, check oil level and adjust as necessary.
4. Tighten or replace loose, missing or damaged nuts, bolts, or screws.
5. Inspect mechanical seals, if possible, for proper operating temperature, drips, leaks and dirt.
 | Quarterly | SM | SM | SM |
| 1. Inspect anti-rotation device for proper operation.
 | Semi-annually | SM | SM | SM |
| 1. Check alignment, clearances, and rotation of shaft and coupler (requires removal of coupler shroud or cover).
2. Lubricate pump bearings.
3. If equipped with lubricating oil charge, drain old oil, and fill with new oil to full mark on sight indicator (also fill bulb).
 | Annually | SM | SM | SM |
| 1. Refer to [Section 9-1.7 Electric Motors](#Electric_Motors) for inspection and maintenance requirements of electric motors.
 | As required | SM | SM | SM |
| Sliding Vane Pumps (Section 3-8.2.1) |
| Sliding Vane Pumps | 1. Inspect pump for unusual noise, vibrations, and overheating of bearings and case.
2. Inspect mechanical seals, if possible, for drips or leaks and dirt.
3. Lubricate pump bearings.
 | Quarterly | SM | SM | SM |
| 1. Inspect pump and motor coupling for proper alignment.
2. Refer to manufacturer’s operation and maintenance manual for internal pressure relief testing and calibration procedures.
 | Annually | SM | SM | SM |
| 1. Refer to [Section 3-8.4 Gearboxes](#Gearboxes) for inspection and maintenance of reduction gearboxes.
2. Refer to [Section 9-1.7 Electric Motors](#Electric_Motors) for inspection and maintenance requirements of electric motors.
 | As required | SM | SM | SM |
| Gear Pumps (Section 3-8.2.2) |
| Gear Pumps | 1. Inspect pump for unusual noise, vibrations, and overheating of bearings and case.
2. Inspect mechanical seals, if possible, for drips or leaks and dirt.
3. Lubricate pump bearings
 | Quarterly | SM | SM | SM |
| 1. Inspect pump and motor coupling for proper alignment.
 | Annually | SM | SM | SM |
| 1. Refer to [Section 3-8.4 Gearboxes](#Gearboxes) for inspection and maintenance of reduction gearboxes.
2. Refer to [Section 9-1.7 Electric Motors](#Electric_Motors) for inspection and maintenance requirements of electric motors.
 | As required | SM | SM | SM |
| Diaphragm Pumps (Section 3-8.2.3) |
| Diaphragm Pumps | 1. Inspect hose for cracks or dry rot.
2. Inspect compressed air connections for signs of leaks.
3. Inspect compressed air hose coupling safety pins or safety wires for wear and damage. Replace damaged components.
 | Quarterly | SM | SM | SM |
| 1. Diaphragm pumps should have the internal diaphragm replaced if the pump shows decreased performance. Also check operation of actuator valve and ensure ball checks seat properly.
 | As required | SM | SM | SM |
| Internal Combustion Drives (Section 3-8.3) |
| Internal Combustion Drives | 1. Refer to manufacturer’s operation and maintenance manual for specific maintenance procedures and schedules associated with a specific model of internal combustion drive. Follow all applicable general maintenance and safety requirements listed in the manufacturer’s operation and maintenance manual.
 | As required | SM | SM | SM |
| Gearboxes (Section 3-8.4) |
| Gearboxes | 1. Inspect gearboxes for signs of smoke near shaft connections or discoloration of the gearbox from overheating.
2. Verify that the oil in the sight glass is not dark or appears to have foam. Adjust oil level if required.
 | Quarterly | SM | SM | SM |
| 1. Lubricate bearings per manufacturer’s recommendations.
2. Check motor and gear box and gear box and pump couplers for wear and alignment.
 | Semi-annually | SM | SM | SM |
| 1. Inspect gear alignment within gearbox.
2. Replace lubricant oil in accordance with manufacturer’s specifications and recommendations.
 | Annually | SM | SM | SM |
| **HOSES** |
| Loading Fuel Hoses (Section 3-9.1) |
| Loading Fuel Hoses | 1. Visually inspect hoses for loose covers, cracks, brittle surface coatings, exposed wire braids, exposed reinforcement, flattening, kinks, and bulges or soft spots which might indicate broken or displaced reinforcement.
 | Weekly | OM | OM | OM |
| 1. Pressurize hose to normal working pressure. Check flanged and threaded connections for leaks and inspect hose couplers for fluid seepage by pushing at the base of the coupling with your thumbs; a hose softened by fluid seepage must be replaced.
 | Monthly | OM | OM | OM |
| 1. Check for coupling slippage. Replace hose that shows signs of coupling slippage.
 | Quarterly | SM | \**2**\ OM /**2**/ | SM |
| 1. \**1**\/**1**/
2. Conduct test of fuel hose electrical resistivity using an electrostatic meter in accordance with NFPA 77 & API 2003.
 | Annually | SM | SM | SM |
| Offloading Fuel Hoses (Sections 3-9.2) |
| Offloading Fuel Hoses | 1. Visually inspect hoses for cracks brittle surface coatings, exposed wire braids, exposed reinforcement, flattening, kinks, and bulges or soft spots which might indicate broken or displaced reinforcement.
 | Weekly | OM | OM | OM |
| 1. Check flanged and threaded connections for leaks and inspect hose couplers for fluid seepage by pushing at the base of the coupling with thumbs; a hose softened by petroleum fluid seepage must be replaced. Damaged or leaking hoses must be replaced immediately or isolated and taken out of service.
 | \**2**\ Monthly /**2**/  | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ | \**2**\ OM/ **2**/ |
| 1. Conduct test of offloading fuel hose electrical resistivity as directed in NFPA 77 and API 2003.
 | Annually | SM | SM | SM |
| **AIR ELIMINATOR TANKS** |
| Air Eliminator Tanks (Section 3-10.1) |
| Air Eliminator Tanks | 1. Inspect operation of fuel level probes. Ensure probes operate correctly when the level of fuel in the tank rises to the level of the probe sensing unit.
2. Remove the float vent valve from the air eliminator tank. Clean and inspect the sealing surfaces of the float vent valve. Ensure the float is buoyant in fuel and test the valve to ensure it closes properly.
 | Annually | SM | SM | SM |
| 1. Refer to [Section 8-9.3 Tank Pressure/Vacuum Vents](#Tank_Pressure_Vacuum_Vents) for in- spection and maintenance require- ments of pressure vacuum vents.
 | As required | SM | SM | SM |
| Automatic Air Vents (Section 3-10.2) |
| Automatic Air Vents | 1. Check for proper operation of the automatic air vent. Ensure the vent opens to allow air to escape and ensure the float of the vent is buoyant in petroleum fuel and rises to close the vent when the float is suspended in petroleum fuel.
 | Annually | SM | SM | SM |
| **FUEL ADDITIVE INJECTORS**  |
| Fuel Additive Injectors (Section 3-11) |
| Fuel Additive Injectors | 1. Inspect injectors to ensure they are operating properly.
 | When fuel system has flow through it, inspect weekly. When fuel system is sitting idle, inspect injectors monthly. | OM | OM | OM |
| 1. Calibrate injector to ensure proper additive to fuel ratio.
 | Annually | SM | SM | SM |
| **CONTROL VALVES – TYPE II HYDRANT SYSTEM** |
| General System Control Valves (Section 4-3.2.1) |
| General System Control Valves | 1. Verify operating settings of valve. Valve adjustment must be in accordance with manufacturer's operation and maintenance manuals and final start-up and commissioning set points. Use of DoD standard set points should only be used as a reference starting point as pipe size and other hydraulic factors influence final system settings.
 | Quarterly | SM | SM | SM |
| 1. Remove and clean strainer installed in the petroleum fuel supply line to the pilot and main valve diaphragm. This strainer is provided to prevent clogging of the orifice in the supply line. Clogging of the screen will cause malfunctioning of the valve
 | Annually for unfiltered systems and as required for filtered systems. | SM | SM | SM |
| 1. Diaphragms must be removed and inspected for deterioration and breaks at the flexing joint. Damage is often caused by pipe scale, pipe tape, and thread sealant compound that collect above the diaphragm and become lodged between the diaphragm and bonnet of the valve. Damage may also be caused by a change of operational petroleum fuel type or grade (such as a change from JP-4 to JP-8).
 | Every 10 years | SM | SM | SM |
| Refuel Control Valves (Section 4-3.2.5) |
| Refuel Control Valves | 1. Verify refuel control valve is set to maintain 100 psig (690 kPa) (typ- ical operating pressure) as meas- ured at the furthest hydrant outlet.
2. Verify pressure-reducing control will open at 5 psig (35 kPa) above normal operating pressure (typ- ically 105 psig (725 kPa) as meas- ured at the farthest hydrant outlet)
3. Verify refueling control valve opening rate is set between 15 and 20 seconds. The valve should open as quickly as possible without tripping the pressure differential control shut-off.
4. Verify operation of the excess flow shut-off function.
5. Verify operation of solenoid.
 | Quarterly | SM | SM | SM |
| 1. Refer to [Section 4-3.2.1 General System Control Valves](#General_System_Control_Valves) for additional inspection and maintenance requirements.
 | As required | SM | SM | SM |
| Pressure Relief Valves (Section 4-3.2.6) |
| Pressure Relief Valves | 1. Verify pressure relief valve will open at 10 psig (69 kPa) above normal inlet pressure to the refuel control valve.
 | Semi-annually | SM | SM | SM |
| 1. Refer to [Section 4-3.2.1 General System Control Valves](#General_System_Control_Valves) for additional inspection and maintenance requirements.
 | As required | SM | SM | SM |
| Defuel Control Valves (Section 4-3.2.7) |
| Defuel Control Valves | 1. Verify the defuel control valve opens when the solenoid on the defuel control valve is energized.
 | Quarterly | SM | SM | SM |
| 1. Refer to [Section 4-3.2.1 General System Control Valves](#General_System_Control_Valves) for additional inspection and maintenance requirements.
 | As required | SM | SM | SM |
| Dual Rate-of-Flow Control Valves (Section 4-3.2.8) |
| Dual Rate-of-Flow Control Valves | 1. Verify dual rate-of-flow control valve is set to maintain a flow rate of 200 gpm (12.5 lps).
2. Verify check valve feature is operational.
 | Quarterly | SM | SM | SM |
| 1. Refer to [Section 4-3.2.1 General System Control Valves](#General_System_Control_Valves) for additional inspection and maintenance requirements.
 | As required | SM | SM | SM |
| Combination Dual Rate-of-Flow Control and Solenoid Valves (Section 4-3.3.1) |
| Combination Dual Rate-of-Flow Control and Solenoid Valves | 1. Verify valve is set to maintain a flow rate of 300 gpm (19 lps).
2. Verify operation of check valve feature.
3. Verify solenoid operation.
 | Quarterly | SM | SM | SM |
|  | 1. Refer to [Section 4-3.2.1 General System Control Valves](#General_System_Control_Valves) for additional inspection and maintenance requirements.
 | As required | SM | SM | SM |
| Dual Pressure Relief, Solenoid Shutoff, and Check Valves (Section 4-3.3.2) |
| Dual Pressure Relief, Solenoid Shutoff, and Check Valves | 1. Verify high pressure relief control will open at 5 psig (35 kPa) above the refuel control valve pressure relief control set point (typically set at 110 psig (760 kPa)).
2. Verify low pressure relief control will open at 5 psig (35 kPa) when refueling pumps are stopped.
3. Verify closing speed provides a smooth, pulsation free operation.
4. Verify operation of solenoid valve.
 | Quarterly | SM | SM | SM |
|  | 1. Refer to [Section 4-3.2.1 General System Control Valves](#General_System_Control_Valves) for additional inspection and maintenance requirements.
 | As required | SM | SM | SM |
| **CONTROL VALVES – TYPE III HYDRANT SYSTEM** |
| Non-Surge Check Valves (Section 4-4.2.1) |
| Non-Surge Check Valves | 1. Verify main valve opening speed (typically 20 seconds). Adjust if required.
2. Verify valve maintains 650 gpm (41 lps) flow rate (some instances 950 gpm (60 lps) flow rate). Adjust if required.
3. Ensure the check valve function is operating properly.
 | Semi-annually | SM | SM | SM |
| 1. Refer to [Section 4-3.2.1 General System Control Valves](#General_System_Control_Valves) for additional inspection and maintenance requirements

. | As required | SM | SM | SM |
| Filter Separator Control Valves (Section 4-4.2.2) |
| Filter Separator Control Valves | 1. Test FSCV emergency shut off solenoid under flow conditions and ensure that valve closes within 10 seconds of EFSO button activation. Coordinate with overall EFSO test listed in [Section 9-1.2.1 Inspection and Maintenance - Electrical Equipment](#Inspection_and_Maintenance_ElectricalEqu).
2. Operate test button (if installed) to ensure the FSCV closes at high water level. Physically press the test button, while recirculating fuel, and ensure the FSCV closes. Note: closing speed is a function of the number of open filters separators and the number of pumps operating. With all filters open and only one pump operating, the valve will close very slowly.
 | Quarterly | SM | SM | SM |
| 1. Verify valve maintains flow rate (typically 600 gpm (38 lps), operating range based on commissioning documentation). Adjust flow rate if required. Flow rate is determined by filter separator vessel gpm (lps) rating, or element flow rate, whichever is less. Use return venturi to measure and confirm flow rate during valve testing and adjustment.
2. Ensure check valve function is operating properly.
 | Semi-annually  | SM | SM | SM |
| 1. Test buoyancy of water level float. Remove the ball or float assembly and place it in a bucket of water. Correctly operating ball or float will float at the top of the water’s surface.
 | When coalescer cartridges are changed. | SM | SM | SM |
| 1. Refer to [Section 4-3.2.1 General System Control Valves](#General_System_Control_Valves) for additional inspection and maintenance requirements.
 | As required | SM | SM | SM |
| Defuel/Flush Valves (Section 4-4.2.3) |
| Defuel/Flush Valves | 1. Ensure Solenoids A and B are de-energized with system in automatic mode and lead pump operating.
2. Ensure Solenoid A is energized and Solenoid B is de-energized to allow main valve to open and drop system pressure to 80 psig (550 kPa) (typical set pressure) with system in automatic mode and lead pump off.
3. Ensure Solenoid A is de-energized and Solenoid B is energized when system is in flush mode.
4. Ensure Solenoids A and B are de-energized when system is in tightness test mode.
5. Check opening and closing speed. Speed should be as fast as possible while still maintaining smooth operation.
 | Quarterly | SM | SM | SM |
|  | 1. Refer to [Section 4-3.2.1 General System Control Valves](#General_System_Control_Valves) for additional inspection and maintenance requirements.
 | As required | SM | SM | SM |
| Issue Venturi (Section 4-4.2.4) |
| Issue Venturi | 1. Ensure issue venturi DPTs are reading the same value within ± 2% full scale.
 | Semi-annually | SM | SM | SM |
| 1. Refer to [Section 6-7.4 Differential Pressure Transmitters](#Differential_Pressure_Transmitters) for inspection and maintenance requirements of DPTs
 | As required | SM | SM | SM |
| Return Venturi (Section 4-4.2.5) |
| Return Venturi | 1. Ensure return venturi DPTs are reading the same value within ± 2% full scale.
 | Semi-annually | SM | SM | SM |
|  | 1. Refer to [Section 6-7.4 Differential Pressure Transmitters](#Differential_Pressure_Transmitters) for inspection and maintenance requirements of DPTs.
 | As required | SM | SM | SM |
| Back Pressure Control Valves (Section 4-4.2.6) |
| Back Pressure Control Valves | 1. Verify constant upstream pressure is maintained at the setpoint established and listed in the system commissioning documents. Adjust setting of BPCV as necessary.
2. Ensure Solenoid A is energized and Solenoid B is de-energized while lead pump is operating in automatic mode.
3. Ensure Solenoids A and B are de-energized prior to lead pump shutdown and system going to stand-by.
4. Ensure Solenoids A and B are de-energized while system is in flush mode.
5. Ensure that Solenoid A is de-energized and Solenoid B is energized while system is in tightness test mode.
6. Verify closing speed control. Valve should close as fast as possible while still maintaining smooth operation.
7. Check solenoid EFSO feature when equipped. Coordinate test with overall EFSO test listed in [Section 9-1.2.1 Inspection and Maintenance - Electrical Equipment.](#Inspection_and_Maintenance_ElectricalEqu)
 | Quarterly  | SM | SM | SM |
|  | 1. Refer to [Section 4-4.2.1 General System Control Valves](#General_System_Control_Valves) for additional inspection and maintenance requirements.
 | As required | SM | SM | SM |
| Pressure Control Valves (Section 4-4.2.7) |
| Pressure Control Valves | 1. Ensure Solenoid A is energized and Solenoid B is de-energized while system is in automatic mode and lead pump is operating.
2. Ensure Solenoids A and B are de-energized while system is in automatic mode and lead pump is off. Verify valve opens to maintain system pressure at 75 psig (515 kPa).
3. Ensure Solenoid A is energized and Solenoid B is de-energized while system is in flush mode and lead pump is operating.
4. Ensure Solenoids A and B are de-energized while system is in flush mode and pumps are off.
5. Ensure Solenoids A and B are energized while system is in tightness test mode.
6. Verify closing speed control. Valve should close as fast as possible while still maintaining smooth operation.
 | Quarterly | SM | SM | SM |
| 1. Refer to [Section 4-3.2.1 General System Control Valves](#General_System_Control_Valves) for additional inspection and maintenance requirements.
 | As required | SM | SM | SM |
| Hydrant Control Valves (Section 4-4.2.8) |
| Hydrant Control Valves | 1. Verify HCV maintains 45 psig (310 kPa) nozzle pressure at a flow of 50 to 600 gpm (3 to 38 lps).
2. Verify HCV closes when nozzle pressure exceeds 50 psig (345 kPa).
3. Verify HCV opening rate is set at a minimum of 20 seconds.
4. Ensure HCV opens when the deadman control level is pressed.
5. Verify HCV closes in five seconds maximum after the deadman lever is released.
 | Quarterly | SM | SM | SM |
| 1. Refer to [Section 4-3.2.1 General System Control Valves](#General_System_Control_Valves) for additional inspection and maintenance requirements.
 | As required | SM | SM | SM |
| Emergency Shut-off Valves (Section 4-4.2.9) |
| Emergency Shut-off Valves | 1. Ensure Solenoids A and B are energized under normal operations.
2. Ensure Solenoids A and B are de-energized during emergency stop conditions.
3. Test emergency stop function of the valve under flow conditions. Ensure the valve closes within 10 seconds of EFSO button activation. Coordinate test with overall EFSO test listed in [Section 9-1.2.1 Inspection and Maintenance - Electrical Equipment](#Inspection_and_Maintenance_ElectricalEqu).
4. Verify differential control maintains a constant seven psig (48 kPa) differential pressure between the inlet and outlet of the valve.
5. Ensure thermal relief function (ball check valve) relieves excess pressure when cover chamber pressure exceeds inlet pressure.
 | Quarterly | SM | SM | SM |
| 1. Refer to [Section 4-3.2.1 General System Control Valves](#General_System_Control_Valves) for additional inspection and maintenance requirements.
 | As required | SM | SM | SM |
| **CONTROL VALVES – TYPE IV AND V HYDRANT SYSTEMS** |
| Pantograph Control Valves (Section 4-5.2.12) |
| Pantograph Control Valves | 1. Verify PTCV maintains 55 psig (380 kPa) nozzle pressure at a flow of 50 to 600 gpm (3 to 38 lps).
2. Verify PTCV opens when the deadman control lever is pressed.
3. Verify PTCV closes in a maximum of 10 seconds after deadman lever is released.
 | Quarterly | SM | SM | SM |
| 1. Refer to [Section 4-3.2.1 General System Control Valves](#General_System_Control_Valves) for additional inspection and maintenance requirements.
 | As required | SM | SM | SM |
| Pantograph Pressure Control Valves (Section 4-5.2.13) |
| Pantograph Pressure Control Valves | 1. Verify PPCV opens at 75 psig (515 kPa).
2. Verify PPCV opening and closing speed are three seconds.
 | Quarterly | SM | SM | SM |
| Fixed Pantographs (Section 4-7.1.1) |
| Fixed Pantographs | 1. Place entire pantograph under static pump head pressure and check for leaks, ease of movement, and damaged grounding or bonding wire.
 | Monthly | OM | OM | OM |
| 1. Inspect wheels (if equipped) for warping, cracking, and uneven wear.
2. Inspect exposed piping and components for corrosion.
 | Quarterly | SM | SM | SM |
| 1. Refer to [Section 4-7.3 Fueling Nozzles](#Fueling_Nozzles) for inspection and maintenance requirements of fueling nozzle.
 | As required | SM | SM | SM |
| \**1**\ **Detachable** /**1**/ **Pantographs** (Section 4-7.1.2) |
| \**1**\Detachable /**1**/ Pantographs | 1. Place entire pantograph under static pump head pressure and check for leaks, ease of movement, and damaged grounding or bonding wire.
2. \**2**\ Inspect exposed piping and components for corrosion. /**2**/
 | Monthly | OM | OM | OM |
| 1. Lubricate wheels.
2. Inspect wheels for warping, cracking and uneven wear.
 | Quarterly | SM | SM | SM |
| 1. Refer to [Section 4-7.2 Hydrant Adapters](#Hydrant_Adapters) for inspection and maintenance requirements of pantograph hydrant adapters.
2. Refer to [Section 4-7.3 Fueling Nozzles](#Fueling_Nozzles) for inspection and maintenance requirements of fueling nozzles.
 | As required | SM | SM | SM |
| **HYDRANT ADAPTERS AND NOZZLES** |
| Hydrant Adapters (Section 4-7.\**1**\2/**1**/) |
| Hydrant Adapters | 1. Inspect hydrant adapter for proper operation, damage, and wear.
2. Test operation of dry break system.
 | Quarterly | SM | SM | SM |
| Fueling Nozzles (Section 4-7.\**1**\3**/1**/) |
| Fueling Nozzles | 1. Inspect the condition of the dust cap at the aircraft adapter end and ensure it is in good working order. Dust caps must be attached to nozzles when they are not is use.
2. Test leak resistance of poppet valve against full pump pressure. Unusual conditions found during this test indicate that repair is necessary and the nozzle must be removed from service.
3. Inspect storage racks for moisture or dirt accumulation. Correct conditions that may be attributing to accumulation of moisture or dirt in the storage racks.
4. Remove nozzle for inspection of content impinged upon the mesh screen. Clean and dry screens before nozzles are returned to service. If a strainer ball valve is installed upstream of the nozzle only the strainer in the strainer ball valve needs to be check. Nozzles should not be used while strainers are removed from upstream strainer ball valves.
5. Tests nozzle interlocks. Ensure interlocks prevent release of fuel when the fueling nozzle is not properly connected. Adjust the seating of the poppet valve if required.
6. Check the operation of the manual valve crank assembly for smooth and positive motion on a special test stand.
 | \**1**\Monthly/**1**/ | OM | OM | OM |
| **SUPPRESSORS** |
| Surge Suppressors (Section 4-7.\**1**\4/**1**/) |
| Surge Suppressors | 1. Inspect for nitrogen leaks.
2. Bladder pressure inside surge suppressors must be validated and recharged as needed with nitrogen. Some surge suppressors are also equipped with needle valves. Settings established in the startup and commissioning documents should be maintained. Adjust nitrogen charge per manufacturer’s recommendations.
 | Quarterly | SM | SM | SM |
| \**2**\ Aircraft Fueling Hoses (Section 4-7.5) |
| Aircraft Fueling Hoses  | 1. Visually inspect hoses for loose covers, cracks, brittle surface coatings, exposed wire braids, exposed reinforcement, flattening, kinks, and bulges or soft spots which might indicate broken or displaced reinforcement.
 | Monthly | OM | OM | OM |
| 1. Pressurize hose to normal working pressure. Check flanged and threaded connections for leaks and inspect hose couplers for fluid seepage by pushing at the base of the coupling with thumbs. A hose softened by petroleum fluid seepage must be replaced.
 | Monthly | OM | OM | OM |
| 1. Check for coupling slippage. Replace hose that shows signs of coupling slippage.
 | Quarterly | SM | SM | SM |
| 1. For hot pit refueling hoses only, refer to Appendix D, Section D-2.1, Loading Hose Hydrostatic Test, for loading hose hydrostatic testing requirements and procedures.
 | Annually | SM | SM | SM |
| E. Conduct test of petroleum fuel hose electrical resistivity using an electrostatic meter in accordance with NFPA 77 and API 2003. | Annually | SM | SM | SM /**2**/ |
| **HYDRANT SYSTEM PRODUCT RECOVERY** |
| Overfill Valve for Product Recovery Tanks (Section 4-8.1) |
| Overfill Valve for Product Recovery Tanks | 1. Verify that a green light is illuminated on the pump control panel graphic display when OV is open.
2. Ensure pressure reservoir bladder is charged with 13 to 15 psig (90 to 103 kPa) of nitrogen and that the reservoir holds fuel pressure.
3. Verify that the OV closes when the control float is lifted (normally 95% full). Use the manual tester to lift the float. NOTE: When the float in the product recovery tank rises and the OV closes, the pressure in the pressure reservoir tank will decrease.
4. Verify that a red light is illuminated and that an alarm is activated on the pump control panel graphic display when OV is closed. Alarm is activated by a limit switch installed on the OV.
5. Ensure the pressure reservoir tank holds FTP deadhead pressure when the pump is deactivated.
6. Open and clean reservoir inlet strainer.
 | Semi-annually | SM | SM | SM |
| 1. Refer to [Section 6-6.3 Thermal and Pressure Relief Valves](#Thermal_and_Pressure_Relief_Valves) for inspection and maintenance requirements of thermal and pressure relief valves.
 | As required | SM | SM | SM |
| **MARINE RECEIVING AND DISPENSING EQUIPMENT** |
| \**1**\Piers and Wharves Fuel Containment Systems (5-1.2) /**1**/ |
| \**1**\ Piers and Wharves /**1**/ | \**1**\1. Hydrostatically test the secondary containment and associated drainage systems to include containment concrete/sealant, drain inlets, drain lines and containment drain valves to ensure containment is liquid tight. This test may use opportune rainfall by holding rainwater in the containment system for one hour. Where evaporation is a concern, conduct the testing when this concern would be minimized, such as at night/early morning or during a time of year when this would not be as much of an issue. Record the water level at the start of the 60-minute (minimum) hold period. If the water level drops by 1/8 inch or more, perform and record an investigation to determine the cause and any required repairs. Refer to [Appendix B](#APPENDIX_B) for testing procedures and to document the testing./**1**/.
 | \**1**\Every 3 Years /**1**/ | \**1**\SM /**1**/ | \**1**\SM /**1**/ | \**1**\SM /**1**/ |
| Marine Receipt (5-2) |
| Marine Receipt | 1. Conduct a shore side inspection of the pier or wharf for signs of damage as soon as marine barge or tanker disembarks.
 | After each use | OM | OM | OM |
| 1. Inspect the ground switch used between the marine barge or tanker and the petroleum fuel receipt piping.
2. Inspect mooring lines, cleats, bollards, bitts, pulley blocks, steel wire ropes, and winches. Use UFC 4-150-08 as a guide when conducting inspections. Repair or replace damaged components as required.
 | Monthly | OM | OM | OM |
| 1. Refer to [Section 6-1 Pipe Testing and Inspections](#PIPE_TESTING_AND_INSPECTIONS) for inspection and maintenance requirements of petroleum fuel pipelines installed above water surfaces. These pipelines are regulated under 33 CFR 154 and 156. Any additional requirements listed under 33 CFR 154 and 156 must also be followed.
2. Refer to [Section 5-5.1 Marine Transfer Hoses](#Marine_Bulk_Transfer_Hoses) for inspection and maintenance requirements of petroleum fuel marine hoses.
3. Refer to [Section 5-4 Marine Loading Arms](#MARINE_LOADING_ARMS) for inspection and maintenance requirements of petroleum fuel marine loading arms.
4. Refer to [Section 3-6.4 Basket Strainers](#Basket_Strainers) for inspection and maintenance requirements of basket strainers.
5. Refer to [Section 3-7 Meters](#METERS) for inspection and maintenance requirements of petroleum fuel meters.
6. Refer to [Section 3-8.2 Positive Displacement Pumps](#Positive_Displacement_Pumps) for inspection and maintenance requirements of stripper pumps.
7. Refer to [Section 9-1.6 Grounding Systems](#Grounding_Systems) for inspection and maintenance requirements of grounding systems.
 | As required | SM | SM | SM |
| Marine Issue (Section 5-3) |
| Marine Issue | 1. Inspect pier or wharf for signs of damage as soon as marine barge or tanker disembarks.
 | After each use | OM | OM | OM |
| 1. Inspect the ground switch between the fueling tanker/barge and the fuel system.
2. Inspect mooring lines, cleats, bollards, bitts, pulley blocks, steel wire ropes, and winches. Use UFC 4-150-08 as a guide when conducting inspections. Repair or replace damaged components as required.
 | Monthly | OM | OM | OM |
| 1. Refer to [Section 6-1 Pipe Testing and Inspections](#PIPE_TESTING_AND_INSPECTIONS) for inspection and maintenance requirements of petroleum fuel pipelines installed above water surfaces. These pipelines are regulated under 33 CFR 154 and 156. Any additional requirements listed under 33 CFR 154 and 156 must also be followed.
2. Refer to [Section 3-6.4 Basket Strainers](#Basket_Strainers) for inspection and maintenance requirements of basket strainers.
3. Refer to [Section 3-8 Pumps](#PUMPS) for inspection and maintenance requirements of marine loading and stripper pumps.
4. Refer to [Section 3-7 Meters](#METERS) for inspection and maintenance requirements of petroleum fuel meters.
5. Refer to [Section 5-5.1 Marine Transfer Hoses](#Marine_Bulk_Transfer_Hoses) for inspection and maintenance requirements of petroleum fuel marine hoses.
6. Refer to [Section 5-4 Marine Loading Arms](#MARINE_LOADING_ARMS) for inspection and maintenance requirements of petroleum fuel marine loading arms.
7. Refer to [Section 9-1.6 Grounding Systems](#Grounding_Systems) for inspection and maintenance requirements of grounding systems.
 | As required | SM | SM | SM |
| Marine Loading Arms (Section 5-4) |
| Marine Loading Arms | 1. Check swivel for smooth operation. Check seals for signs of wear and discoloration which may indicate a seal or ball bearing failure.
 | \**2**\ Monthly /**2**/  | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ | \**2**\ OM /**2**/  |
| 1. Inspect ball bearings when accessible. Rough and/or uneven wear on the surface are indications of swivel joint failure
2. Conduct pressure test of marine loading arms in accordance with 33 CFR 156.170 *Equipment Tests and Inspections*, Section (f)(1).
 | Annually | SM | SM | SM |
| Marine Bulk Transfer Hoses (Section 5-5.1) |
| Marine Bulk Transfer Hoses | 1. Visually inspect transfer hoses. Transfer hoses must have no loose covers, kinks, bulges, soft spots, and no gouges, cuts or slashes that penetrate the hose reinforcement. Hoses must also have no external deterioration.
 | Before each use | OM | OM | OM |
| 1. Visually survey petroleum fuel marine hoses. Observe the general condition and look for fluid puddles, fine mists, physical damage such as jacket abrasion or deformation, and deteriorated joints. Use sense of smell to detect petroleum vapor. Look for improper hose handling that may overstress the hose by stretching, relative movement, or kinking.
 | During each use | OM | OM | OM |
| 1. Refer to [Appendix D, Section D-2.2 Marine and Underwater Transfer Hose Hydrostatic Test](#D_2_2) for marine transfer hose hydrostatic testing requirements and procedures.
 | Annually or not less than 30 days prior to the first transfer conducted past one year from the date of the last test and inspection. | SM | SM | SM |
| Underwater Hoses (Section 5-5.2) |
| Underwater Hoses | 1. Refer to [Appendix D, Section D-2.2 Marine and Underwater Transfer Hose Hydrostatic Test](#D_2_2) for underwater hose hydrostatic testing requirements and procedures.
 | Annually or not less than 30 days prior to the first transfer conducted past one year from the date of the last test and inspection. | SM | SM | SM |
| Single Point Mooring Systems (Section 5-7.1) |
| Single Point Mooring Systems | 1. Inspect and, if necessary, repair or replace all mooring hawsers or lines, deck hose, chain, chair stoppers, flange adaptors, gaskets or other gear used in mooring the marine tanker and in connecting hoses.
 | Monthly | OM | OM | OM |
| 1. Inspect air-compressor for proper operation.
2. Inspect navigation aids and mooring buoy, in accordance with NAVFAC MO-124 *Mooring Maintenance Manual*, for evidence of damage and possible movement or dragging by vessels, current or winds.
3. Divers must conduct underwater inspections of mooring chains, shackles and anchors attaching buoys to bay/harbor floors.
 | Annually | SM | SM | SM |
| 1. Conduct overhaul of single point mooring buoys every 3 to 5 years. Single point mooring buoys must be brought ashore for repair in these instances.
 | Every 5 years | SM | SM | SM |
| Multi Point Mooring Systems (Section 5-7.2) |
| Multi Point Mooring Systems | 1. Inspect and, if necessary, repair or replace all mooring hawsers or lines, deck hose, chain, chair stoppers, flange adaptors, gaskets or other deck gear used in mooring the marine tanker and in connecting underwater hoses.
 | Monthly | OM | OM | OM |
| 1. Inspect navigation aids and mooring buoys, in accordance with NAVFAC MO-124 *Mooring Maintenance Manual*, for evidence of damage and possible movement or dragging by vessels, current or winds.
2. Divers must conduct underwater inspections of mooring chains, shackles and anchors attaching buoys to bay/harbor floors.
 | Annually | SM | SM | SM |
| **SUBMERGED PIPING SYSTEMS** |
| Submerged Piping Systems (Section 5-8) |
| Submerged Piping Systems | 1. Inspect water above submerged pipelines and their seaward end for tell-tale petroleum fuel slicks indicating leakage from pipes or underwater hoses.
 | Weekly | OM | OM | OM |
| 1. If equipped, electrically check the cathodic protection rectifier for proper performance.
 | Six times each calendar year with intervals not exceeding 2½ months | SM | \**2**\ OM /**2**/ | SM |
| 1. Divers must inspect submerged pipe and hoses for signs of incipient failure or indications of rapid wear of parts subject to wave motion or abrasion on the ocean floor.
 | Semi-annually | SM | SM | SM |
| 1. Conduct annual pipe test as specified in [Appendix G](#APPENDIX_G) – Petroleum Fuel Pipeline Pressure testing Guidelines and Criteria. Testing requirements of marine pipelines are regulated under 33 CFR 154 and 156, particularly 33 CFR 156 Section 170.
2. Conduct cathodic protection tests on the protected pipeline as specified in [Section 9.2.1 Cathodic Protection](#Cathodic_Protection) at least once each calendar year with intervals not exceeding 15 months between tests from consecutive years.
 | Annually | SM | SM | SM |
| Boom Reels (Section 5-9) |
| Boom Reels | 1. Visually inspect hydraulic drives and hose connections for leaks.
2. Grease bearings.
3. Inspected boom reel for signs of corrosion. Inspect breaking system and ensure it is in good working order.
 | Quarterly | SM | SM | SM |
| 1. Inspect boom for wear, rips, and tears. Repair or replace as required to ensure containment of petroleum fuel in the event of a spill.
 | Annually | SM | SM | SM |
| **ON-BASE PIPELINES** |
| On-Base Pipelines (Section 6-1.1) |
| On-Base Pipelines | 1. Conduct petroleum fuel pipeline visual Inspection of aboveground piping in accordance with [Section 6-1.5 Pipeline Visual Inspection](#Pipe_Visual_Inspection).
 | Monthly | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ | SM |
| 1. Conduct line walk in areas of petroleum fuel piping in accordance with [Section 6-1.6 Line Walk.](#Line_Walk).
 | Conduct during transfer operations, or monthly, at a minimum | OM | OM | OM |
| 1. Conduct annual test as specified in [Appendix G](#APPENDIX_G) – Petroleum Fuel Pipeline Pressure Testing Guidelines and Criteria.
 | Annually | SM | \**2**\ OM /**2**/ | SM |
| 1. Conduct cathodic protection tests as specified in [Section 9.2.1 Cathodic Protection](#Cathodic_Protection) on protected petroleum fuel pipelines at least once each calendar year, but with intervals not exceeding 15 months.
 | Annually | SM | SM | SM |
| 1. Conduct five year test as specified in [Appendix G](#APPENDIX_G) – Petroleum Fuel Pipeline Pressure Testing Guidelines and Criteria.
 | Every five years | SM | SM | SM |
| 1. Conduct petroleum fuel pipeline API 570 inspection in accordance with [Section 6-1.9 API 570 Inspections](#API570_Inspections).
 | Every 5 or 10 years depend-ing on API class piping or in accordance with Pipeline Integ-rity Manage-ment Plan (PIMP). | SM | SM | SM |
| 1. Conduct petroleum fuel pipeline cleaning in accordance with [Section 6-2 General Pipeline Cleaning](#General_Pipeline_Cleaning).
 | As required to ensure fuel quality. | SM | SM | SM |
| **INTER-TERMINAL PIPELINES** |
| Non-DOT Regulated (Section 6-1.2.1) |
| Non-DOT Regulated | 1. Conduct petroleum fuel pipeline volume check in accordance with Section [6-1.8 Volume Check](#Volume_Check).
 | Monthly | OM | OM | OM |
| 1. Conduct line patrol in areas of underground petroleum fuel pipeline in accordance with [Section 6-1.7 Line Patrol](#Line_Patrol).
 | Annually | OM | OM | OM |
| 1. Government operated inter-terminal petroleum fuel pipelines must follow the maintenance requirements listed in [Section 6-1.1.1 for On-Base Pipelines](#On_Base_Pipelines).
 | As required | SM/OM | SM/OM | SM/OM |
| Aboveground Piping (Section 6-1.3) |
| Aboveground Piping  | 1. Conduct petroleum fuel piping visual Inspection in accordance with [Section 6-1.5 Pipeline Visual Inspection](#Pipe_Visual_Inspection).
 | Weekly | OM | OM | OM |
| 1. Conduct petroleum fuel piping annual test as specified in [Appendix G](#APPENDIX_G) – Petroleum Fuel Pipeline Pressure Testing Guidelines and Criteria.
 | Annually | SM | SM | SM |
| 1. Conduct petroleum fuel piping API 570 inspection in accordance with [Section 6-1.9 API 570 Inspections](#API570_Inspections).
 | Every 5 or 10 years depend-ing on API class piping or in accordance with Pipeline Integ-rity Manage-ment Plan (PIMP).Management Plan (PIMP). | SM | SM | SM |
| 1. Conduct cleaning of petroleum fuel piping in accordance with [Section 6-2 General Pipeline Cleaning](#General_Pipeline_Cleaning).
 | As required to ensure fuel quality. | SM | SM | SM |
| Double-Wall Piping (Section 6-1.4) |
| Double-Wall Piping | 1. Conduct petroleum fuel pipeline visual Inspection of aboveground piping in accordance with [Section 6-1.5 Pipeline Visual Inspection](#Pipe_Visual_Inspection).
 | Monthly | OM | OM | OM |
| 1. Conduct annual carrier pipe test as specified in [Appendix G](#APPENDIX_G) – Petroleum Fuel Pipeline Pressure Testing Guidelines and Criteria.
2. Conduct cathodic protection tests as specified in [Section 9.2.1 Cathodic Protection](#Cathodic_Protection) on protected petroleum fuel pipelines at least once each calendar year, but with intervals not exceeding 15 months.
 | Annually | SM | SM | SM |
| 1. Conduct containment pipe test as specified in [Appendix G](#APPENDIX_G) – Petroleum Fuel Pipeline Pressure Testing Guidelines and Criteria.
 | Every three years | SM | SM | SM |
| 1. Conduct petroleum fuel pipeline API 570 inspection in accordance with [Section 6-1.9 API 570 Inspections](#API570_Inspections).
 | Every 5 or 10 years depend-ing on API class piping or in accordance with Pipeline Integ-rity Manage-ment Plan (PIMP).Management Plan (PIMP). | SM | SM | SM |
| 1. Conduct petroleum fuel pipeline cleaning in accordance with [Section 6-2 General Pipeline Cleaning](#General_Pipeline_Cleaning).
 | As required to ensure fuel quality. | SM | SM | SM |
| **MANUAL VALVES** |
| Plug Valves – Lubricated (Section 6-6.2.1) |
| Plug Valves - Lubricated | 1. Open and close valve to check for ease of operation.
 | Quarterly | SM | SM | SM |
| 1. Lubricate valve operator stems and all grease fittings.
2. Inspect valve exterior for corrosion and tightness of bolts. Repaint/tighten as required.
 | Semi-annually | SM | SM | SM |
| Plug Valves – Non-lubricated (Section 6-6.2.2) |
| Plug Valves Non-Lubricated | 1. Open and close valve to check for ease of operation. Adjust or replace packing as needed.
 | Quarterly | SM | SM | SM |
| 1. Inspect valve exterior for corrosion and tightness of bolts. Repaint and retighten as required.
 | Semi-annually | SM | SM | SM |
| Gate Valves (Section 6-6.2.3) |
| Gate Valves | 1. Open and close valve to check for ease of operation. Adjust or replace packing as needed.
 | Quarterly | SM | SM | SM |
| 1. Lubricate valve operator stem.
2. Inspect valve exterior for corrosion and tightness of bolts. Repaint and retighten as required.
 | Semi-annually | SM | SM | SM |
| Ball Valves (Section 6-6.2.4) |
| Ball Valves | 1. Open and close valve to check for ease of operation.
2. Lubricate overhead ball valve chain operator gears.
3. Adjust packing per manufacturer’s specifications.
4. Inspect valve exterior for corrosion and tightness of bolts. Repaint/tighten as required.
 | Quarterly | SM | SM | SM |
| 1. Refer to [Section 6-6.2.10 Manual Valve Gear Operators](#Manual_Valve_Gear_Operators) for inspection and maintenance of gear operators if equipped.
 | As required | SM | SM | SM |
| Double Block and Bleed Valves (Section 6-6.2.5) |
| Double Block and Bleed Valves | 1. Open and close valve to check for ease of operation.
2. Lubricate overhead valve chain operator gears if equipped.
3. Adjust packing per manufacturer’s specifications.
4. Inspect valve exterior for corrosion and tightness of bolts. Repaint and tighten as required.
5. Operate the body cavity drain when valve is in closed position to ensure that the valve is closing properly.
 | Quarterly | SM | SM | SM |
| 1. \**2**\ Keep the valve operator housing full of lubricant to displace and prevent moisture from accumulating and freezing, in accordance with manufacturer’s recommendations.
 | Semi-Annually | SM | SM | SM |
| 1. Remove bottom drain plug and drain valve.
 | Annually | SM | SM | SM |
| 1. Refer to Section 6-6.2.10, Manual Valve Gear Operators, for inspection and maintenance of gear operators, if equipped.
2. Some double block and bleed valves are equipped with integrated pressure/thermal relief valves. Refer to Section 6-6.3, Thermal and Pressure Relief Valves, for inspection and maintenance requirements of pressure/thermal relief valves. /**2**/
 | As required | SM | SM | SM |
| Butterfly Valves (Section 6-6.2.6) |
| Butterfly Valves | 1. Open and close valve to check for ease of operation. Ensure that lever operators and locking mechanisms are in place and working properly.
2. Adjust packing per manufacturer’s specifications as needed. If butterfly valves are leaking or not shutting off flow, tightening the gland flange to tighten the stem packing or remove the valve from service and replace the seats as necessary.
3. Inspect valve exterior for corrosion and tightness of bolts. Repaint and retighten as required
 | Quarterly | SM | SM | SM |
| Globe Valves (Section 6-6.2.7) |
| Globe Valves | 1. Open and close valve to check for ease of operation.
2. Adjust packing per manufacturer’s specifications as needed.
3. Inspect valve exterior for corrosion and tightness of bolts. Repaint/tighten as required
 | Quarterly | SM | SM | SM |
| Check Valves (Section 6-6.2.8) |
| Check Valves | 1. Use external test lever to make sure the valve is not sticking if equipped. If a check valve is suspected of not checking and cannot be serviced in place, it must be removed from the piping system and serviced in a shop.
2. Inspect valve exterior for corrosion and tightness of bolts. Repaint and retighten as required.
 | Quarterly | SM | SM | SM |
| Line Blanks, Ring Spacers, and Spectacle Blinds (Section 6-6.2.9) |
| Line Blanks, Ring Spacers, and Spectacle Blinds | 1. Inspect exposed side of spectacle blinds. The exposed side must be kept clean and free of corrosion.
2. Spectacle blinds should be inspected to ensure they are installed with the correct orientation for the desired flow or no-flow condition.
 | Quarterly | SM | SM | SM |
| Manual Valve Gear Operators (Section 6-6.2.10) |
| Manual Valve Gear Operators | 1. Lubricate gear driven operators and check for smooth operation
 | Quarterly | SM | SM | SM |
| **RELIEF VALVES** |
| Thermal and/or Pressure Relief Valves (Section 6-6.3) |
| Thermal and Pressure Relief Valves | 1. Thermal and pressure relief valves must be inspected for signs of leak-by. Inspect relief valves for leaks by visually inspecting downstream flow indicators (if installed) for flow. If no flow indicators are installed listen for possible leaks. If suspect: isolate and test the relief valve; check opening pressure; and verify re-seating. Malfunctioning valves must be repaired or replaced.
2. Ensure manual isolation valves installed upstream and downstream of thermal and pressure relief valves are open with valve handles are removed, wired open or locked.
 | Monthly | OM | OM | SM |
| 1. Inspect valve exterior of thermal and pressure relief valves for corrosion. Repaint as required. Information plates attached to thermal and pressure relief valves must not be painted over.
 | Quarterly | SM | SM | SM |
| 1. Verify thermal and pressure relief valve setting by consulting as-built and historical data.
2. Thermal and pressure relief valves must be validated for proper calibration by isolating the valve and using the test connection provided on the piping in conjunction with a hand pump and portable reservoir. The operating pressure must be checked against the set pressure listed on the stamped information plate attached to the valve. The operating pressure must be adjusted to the stamped set pressure if necessary.
 | Annually | SM | SM | SM |
| **SEMI-AUTOMATIC VALVES** |
| Fire Valves (Section 6-6.4.1) |
| Fire Valves | 1. Ensure the fusible link mechanism is attached properly to actuate in case of a fire and that it has not been by-passed, blocked, or damaged in any manner. Ensure the fusible link is not filled with debris or paint which could impact operation. \**1**\ Maintain fusible links per manufacturer’s recommendation./**1**/
 | Quarterly | SM | SM | SM |
| 1. Check the closing mechanism to ensure that it closes the valve properly.
 | Annually | SM | SM | SM |
| Fusible Line Butterfly Valves (Section 6-6.4.2) |
| Fusible Link Butterfly Valves | 1. Ensure the fusible link mechanism is attached properly to actuate in case of a fire and that it has not been by-passed, blocked, or damaged in any manner. Ensure the fusible link is not filled with debris or paint which could impact operation. \**1**\ Maintain fusible links per manufacturer’s recommendation./**1**/
 | Quarterly | SM | SM | SM |
| 1. Test the operation of spring closure unit. Ensure that the spring actuator closes the valve and that the valve closes securely against the seat.
 | Annually | SM | SM | SM |
| 1. Refer to [Section 6-6.2.6 Butterfly Valves](#Butterfly_Valves) for additional inspection and maintenance requirements of butterfly valves.
 | As required | SM | SM | SM |
| **AUTOMATIC VALVES** |
| Truck Fill Valves (Section 6-6.5.1) |
| Truck Fill Valves | 1. Verify TFV maintains 35 psig (240 kPa) nozzle pressure at a flow range of 50 to 600 gpm (3 to 38 lps).
2. Verify TFV closes rapidly when outlet pressure exceeds control set point.
3. Verify TFV opens when the deadman control lever is pressed.
4. Verify TFV closes after the deadman control lever is released.
5. If equipped, verify operation of solenoid connected to grounding verification system. Ground verification system should energize solenoid when an acceptable ground is detected by the ground verification unit.
6. Systems that have overflow protection systems must be inspected and maintained concurrently with the inspection and maintenance of TFVs.
 | Quarterly | SM | SM | SM |
| 1. Refer to [Section 4-3.2.1 General System Control Valves](#General_System_Control_Valves) for additional inspection and maintenance requirements.
 | As required | SM | SM | SM |
| Motor Operators (Section 6-6.6) |
| Motor Operators | 1. Visually inspect motor operators to ensure smooth movement during opening and closing operation and adjust, if necessary, to ensure that they are opening and closing fully. Listen for and investigate unusual noises during operation.
2. Lubricate mechanical overrides (if equipped).
 | Quarterly | SM | SM | SM |
| 1. Refer to [Section 9-1.7 Electric Motors](#Electric_Motors) for inspection and maintenance requirements of electric motors
 | As required | SM | SM | SM |
| **PRESSURE/VACUUM INSTRUMENTATION** |
| Pressure and Pressure/Vacuum Gauges (Section 6-7.1) |
| Pressure and Pressure/ Vacuum Gauges | 1. Check operation of gauge. Ensure gauge is indicating pressure of the system.
 | Monthly | OM | OM | OM |
| 1. Clean outside of gauge glass.
 | Quarterly | SM | SM | SM |
| 1. Inspect liquid filled gauges for leakage, refill/replace as needed.
 | Semi-annually | SM | SM | SM |
| 1. Conduct calibration check by comparing readings of the process gauge with the readings of a certified master calibration gauge which has been calibrated within the last year. The process gauge and the master calibration gauge must be connected to the same pressure source for testing. Verify accuracy of gauge is within ±2% of full scale. Calibrate gauge if required.
 | Annually | SM | SM | SM |
| Differential Pressure Gauges (Section 6-7.2) |
| Differential Pressure Gauges | 1. Verify proper operation of differential gauge in accordance with gauge manufacturer’s procedures.
 | Monthly | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ |
| 1. Clean outside of gauge glass.
 | Quarterly | OM | OM | OM |
| 1. Conduct calibration check by comparing readings of the differential process gauge with the readings of a certified differential master calibration gauge which has been calibrated within the last year. The differential process gauge and the differential master calibration gauge must be connected to the same pressure source for testing. Verify accuracy of gauge is within ±2% of full scale. Calibrate if required.
 | Annually | SM | SM | SM |
| 1. Some differential pressure gauges have a small gauge protection filter located at the high pressure inlet of the gauge that must be checked and replaced as needed. Filters need to be replaced if the indicator is moving slow or sluggishly inside the sight glass or if the sight glass is dirty. Refer to manufacturer’s operation and maintenance manual for filter replacement procedure.
 | Annually for inspections and maximum 5 years of service between filter replacements. | SM | SM | SM |
| Pressure Transmitters (Section 6-7.3) |
| Pressure Transmitters | 1. Inspect the exterior of the transmitter enclosure for accumulated oil, dust, and dirt. Clean if required.
2. Check that both enclosure caps are fully threaded onto the enclosure, compressing the O-ring between the cap and the enclosure. The O-ring must not be cracked, broken, or otherwise damaged.
3. Inspect the display viewing glass for cleanliness and damage. Replace the enclosure cap assembly if the glass is damaged or missing. No accumulation of dust, dirt, or water (condensate) should be present inside the enclosure.
4. Inspect transmitter and mounting bracket hardware for tightness. Tighten loose hardware as necessary.
5. Inspect for loose, bent, or cracked sensing lines. Replace damaged sensing lines.
6. Check operation of transmitter. Ensure transmitter is indicating accurate pressure of the system.
 | Quarterly | SM | SM | SM |
| 1. Bleed sensing lines between the transmitter and the main line to ensure they are clean and free of suspended solids and air.
 | Semi-annually | SM | SM | SM |
| 1. Check that all wire connections inside enclosure are tight.
2. Pressure Transmitters (PTs) and Pressure Indicating Transmitters (PITs) must be calibrated mechanically and electrically with test equipment and adjusted if applicable. The presence of air in the sensing line of a pressure transmitter is a common cause for failure. Conduct calibration check by comparing readings of the PT or PIT with the readings of a certified master calibration gauge which has been calibrated within the last year. The PT or PIT and the master calibration gauge must be connected to the same pressure source for testing. Verify accuracy of PT or PIT gauge is within ±2% of full scale. Calibrate in accordance with manufacturer’s operation and maintenance manual if required.
 | Annually | SM | SM | SM |
| Differential Pressure Transmitters (Section 6-7.4) |
| Differential Pressure Transmitters | 1. Inspect the exterior of the transmitter enclosure for accumulated oil, dust, and dirt. Clean as required.
2. Check that both enclosure caps are fully threaded onto the enclosure, compressing the O-ring between the cap and the enclosure. The O-ring must not be cracked, broken, or otherwise damaged.
3. Inspect the display viewing glass for cleanliness and damage. Replace the enclosure cap assembly if the glass is damaged or missing. No accumulation of dust, dirt, or water (condensate) should be present inside the enclosure.
4. Inspect transmitter and mounting bracket hardware for tightness. Tighten loose hardware as necessary.
5. Inspect for loose, bent, or cracked sensing lines. Replace damaged sensing lines.
6. Check operation of transmitter. Ensure transmitter is indicating accurate pressure of the system
 | Quarterly | \**2**\ OM /**2**/ | SM | \**2**\ OM /**2**/ |
| 1. Bleed sensing lines between the transmitter and the main line to ensure they are clean and free of suspended solids and air.
 | Semi-annually | SM | SM | SM |
| 1. Check that all wire connections inside enclosure are tight.
2. DPTs must be calibrated mechanically and electrically with test equipment and adjusted, if applicable. The presence of air in sensing lines of differential pressure transmitters is a common cause for failure. Conduct calibration check by comparing readings of the DPT with the readings of a certified differential master calibration gauge which has been calibrated within the last year. The DPT and the differential master calibration gauge must be connected to the same pressure source for testing. Verify accuracy of DPT is within ±2% of full scale. Calibrate in accordance with manufacturer’s operation and maintenance manual if required.
 | Annually | SM | SM | SM |
| **FLEXIBLE BALL JOINTS** |
| Flexible Ball joints (Section 6-8) |
| Flexible Ball Joints | 1. Lubricate ball joints and inspect for wear and stress.
 | Monthly | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ | SM |
| **THERMOMETERS** |
| Dial Thermometer (Section 6-9.1) |
| Dial Thermometer | 1. Inspect thermometer for cracked face and proper operational condition. Replace if damaged.
 | Quarterly | SM | SM | SM |
| 1. Check accuracy of thermometer against calibrated master thermometer. Ensure process and calibrated master thermometer are reading the same heat source. Verify accuracy of thermometer is within ±2% of full scale. Calibrate process thermometer if required.
 | Annually | SM | SM | SM |
| **PIPE COATINGS** |
| Aboveground Piping and Equipment Coatings (Section 6-10.1) |
| Aboveground Piping and Equipment Coatings | 1. \**2**\ Visually inspect coatings for signs of minor deterioration, corrosion, or damage. Repair damaged or deteriorated coatings.
2. Coatings needing major repairs will be accomplished by system maintainers. /**2**/
 | \**2** \Monthly /**2**/  | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ | SM |
| **UNDERGROUND FUEL PITS** |
| Isolation Valve Pits (Section 6-11.1) |
| Isolation Valve Pits | 1. Isolation valve pits should be inspected to ensure that the pits are dry and clean and that all components within the pit are clean and in good working order. Main- tain seals and boot seals as appro- priate. Obtain necessary confined space entry permits before entry. Inspect the pit for signs of fuel or water. Water or fuel should be removed from the pit as soon as possible and the source of water infiltration or fuel leak determined.
2. Check for cracks in concrete and check piping penetrations through pit wall or bottom to ensure that mechanical seals and boot seals are in good working condition and are allowing no seepage of water into the pits. Make note of cracks in concrete and schedule main- tenance as necessary. Check for fuel leaks at all flanged and other piping connections. Check for rusted or deteriorated ladders or grating platforms that might make entry unsafe. Check pit lids for proper sealing. Check rolling pit covers for ease of operation and signs of deterioration, damage or corrosion. Make sure required locks are in place and locking mechanisms are not broken.
 | Monthly, or more often based on local conditions | OM | OM | OM |
| Hydrant Fuel Pits (Section 6-11.2) |
| Hydrant Fuel Pits | 1. Hydrant fuel pits must be inspected to ensure that they are dry and clean and that all fueling components within the pit are clean and in good working order. Obtain necessary confined space entry permits before entry. Inspect the pit for fuel or water. Fuel or water found in the pit must be sumped out as soon as possible.
2. Check pipe penetrations through pit walls or bottom to ensure that mechanical and boot seals are in good working condition and are allowing no water seepage into the pits.
3. Check for fuel leaks at all flanged and pipe connections.
4. Check pit lids to ensure that seals are in good working order and are preventing water entry into the pits.
5. Inspect hydrant fuel pit bonding cables for corrosion and ensure electrical continuity between bonded equipment.
 | Monthly, or more often based on local conditions | OM | OM | OM |
| High Point Vent Pits (Section 6-11.3) |
| High Point Vent Pits | 1. Inspect high point vent pits to ensure they are dry and free of water and other debris and that pit and piping components are leak free and in good working condition. Inspect the pit for fuel or water. Fuel or water found in the pit must be sumped out as soon as possible.
2. Check pipe penetrations through pit walls or bottom to ensure that mechanical and boot seals are in good working condition and are allowing no water seepage into the pits.
3. Check pit lid seals for deterioration and replace as necessary.
4. Ensure that high point vent valves, quick-disconnect couplings or pit lids are lockable and that locking mechanisms are in good working order.
5. Inspect high point vent pit bonding cables for corrosion and ensure electrical continuity between bonded equipment.
 | Monthly  | OM | OM | OM |
| Low Point Drain Pits (Section 6-11.4) |
| Low Point Drain Pits | 1. Inspect low point drain pits to ensure they are dry and free of water and other debris and that all pit and piping components are leak free and in good working condition. Inspect the pit for fuel or water. Fuel or water found in the pit must be sumped out as soon as possible.
2. Check pipe penetrations through pit wall or bottom to ensure that mechanical seals and boot seals are in good working condition and are allowing no water seepage into the pits.
3. Check pit lid seals for deterioration and replace as necessary.
4. Ensure that low point vent valves, quick-disconnect couplings or pit lids are lockable and that locking mechanisms are in good working order.
5. Inspect low point drain pit bonding cables for corrosion and ensure electrical continuity between bonded equipment.
 | Monthly  | OM | OM | OM |
| Lateral Control Pits (Section 6-11.5) |
| Lateral Control Pits | 1. Inspect lateral control pits to ensure they are dry and free of water and other debris and that all pit and piping components are leak free and in good working condition. Inspect the pit for fuel or water. Fuel or water found in the pit must be sumped out as soon as possible.
2. Check pipe penetrations through pit wall or bottom to ensure that mechanical seals and boot seals are in good working condition and are allowing no water seepage into the pit.
3. Check pit lid seals for deterioration and replace as necessary.
4. Check for fuel leaks at all flanged and other piping connections.
5. Ensure that pit lids are lockable and that locking mechanisms are in good working order.
6. Inspect lateral control pit bonding cables for corrosion and ensure electrical continuity between bonded equipment.
 | Monthly | OM | OM | OM |
| **MINOR PIPING EQUIPMENT** |
| Low Point Drains (Section 6-12.1) |
| Low Point Drains | 1. Visually inspect low point drains. Ensure that quick-disconnect dust caps are in place and that valves are locked closed.
 | Weekly | OM | OM | OM |
| 1. Operate low point drains when system is not under operating pressure. If there is an absence of sufficient line pressure close the low point drain and pressurize the system. Once adequate pressure is available, continue draining until the piping fuel sample is clear and bright with no visible water.
 | Monthly or as required by local conditions. Verify low point drains are closed after maintenance | OM | OM | OM |
| High Point Vents (Section 6-12.2) |
| High Point Vents | 1. Inspect high point vents. If fuel leaks are observed they should be repaired as soon as possible. Ensure that quick-disconnect dust caps are in place and that high point vent valves are locked.
 | Weekly | OM | OM | OM |
| Sight Flow Indicators (Section 6-12.3) |
| Sight Flow Indicators | 1. Verify there are no leaks around pipe connection fittings and glass seals. Also check glass for indications of cracks.
 | Daily or at each use | OM | OM | OM |
| **ELECTRONIC RELEASE DETECTION MONITORING** |
| Rope Sensor Systems (Section 6-13.1.1) |
| Rope Sensor System | 1. Ensure the monitoring panel associated with the rope sensor(s) is powered on and no alarms are present.
 | Daily | OM | OM | OM |
| 1. Test rope sensor system and ensure it is functional.
 | Annually | SM | SM | SM |
| Point Sensor - Dry (Section 6-13.1.2) |
| Point Sensor - Dry | 1. Ensure the monitoring panel associated with the point sensor(s) is powered on and no alarms are present.
 | Daily | OM | OM | OM |
| 1. Ensure monitoring space is clear and free of debris and liquid.
 | Monthly | OM | OM | OM |
| 1. Test sensor and ensure it is functional.
 | Annually | SM | SM | SM |
| Visual Monitoring (Section 6-14.1) |
| Visual Monitoring | 1. Visually inspect ports for signs of leaks. Remove debris or foreign objects obstructing the view.
 | Weekly | OM | OM | OM |
| **FILLING STATION DISPENSERS** |
| Dispenser Nozzles (Section 7-2) |
| Dispenser Nozzles | 1. Inspect dispenser nozzle spout. Ensure it is tight, round, has no cracks, or excessive wear. Inspect automatic shutoff hole. Ensure the hole is open and free of obstructions. Inspect nozzle hold-open latch. Ensure the latch is straight, moves freely, and the return spring operates correctly. Inspect body of nozzle. Ensure the body is in good condition and that the valve stem is clean and free of fuel. Inspect the nozzle to hose connection and ensure it is clean and free of fuel.
 | Daily | OM | OM | OM |
| 1. \**1**/
 | \**1**/ | \**1**/ | \**1**/ | \**1**/ |
| 1. Test automatic shutoff feature and ensure it is operating properly. Test automatic shutoff at all nozzle hold-open latch positions
 | Annually | SM | SM | SM |
| Dispenser Hoses (Section 7-3) |
| Dispenser Hoses | 1. Inspect dispenser hoses and hose whips for gouges, cuts, blisters, or outside wear that may lead to rupture during use. Replace hose or hose whips that show signs of wear. Inspect connection points of hoses and hose whips to the dispenser, breakaways, swivels, and the nozzle and ensure the connection points are clean and free of fuel.
 | Daily | OM | OM | OM |
| Breakaways (Section 7-4) |
| Breakaways | 1. Inspect breakaways for loose connections and signs of damage to poppets. Ensure breakaways are clean and free of fuel.
 | Daily | OM | OM | OM |
| 1. Inspect breakaway for an expiration date established by the manufacturer. Breakaways must be replaced before the indicated expiration date
 | Monthly | OM | OM | OM |
| Swivels (Section 7-5) |
| Swivels | 1. Inspect swivel for loose connections and signs of damage. Ensure swivel rotates easily and is clean and free of fuel.
 | Daily | OM | OM | OM |
| 1. Inspect swivel for expiration date established by manufacturer. Swivels must be replaced before the indicated expiration date.
 | Monthly | OM | OM | OM |
| Hose Retriever (Section 7-6) |
| Hose Retriever | 1. Test hose retriever and ensure it is operating correctly and supporting the hose.
 | Monthly | OM | OM | OM |
| Dispenser Cabinet (Section 7-7) |
| Dispenser Cabinet | 1. Inspect outside of cabinet and ensure it is free of damage. Inspect for fuel stains on the concrete island around the cabinet and on the outside of the cabinet. Ensure the cabinet is free of dirt and fuel.
2. Open both sides of the cabinet and inspect the inside of the cabinet. Ensure the inside of the cabinet and all of the components inside the cabinet are clean and free of fuel.
 | Monthly | OM | OM | OM |
| 1. Ensure door panels and locks operate easily. Inspect anchor bolts of cabinet to dispenser island and ensure the bolts are in good condition.
 | Annually | SM | SM | SM |
| Dispenser Meters (Section 7-8) |
| Dispenser Meters | 1. Inspect meter and ensure meter is clean and free of fuel. Ensure calibration mechanism is sealed.
 | Monthly | OM | OM | OM |
| 1. Since moving parts inside meters are subject to wear, periodic calibration is necessary. Meters must be recalibrated utilizing a certified 5 gallon (20 liter) prover can or other approved method. Meters are considered satisfactory for further operation when the error does not exceed ±0.2% of actual quantity delivered.
 | Annually | SM | SM | SM |
| Dispenser Filters (Section 7-9) |
| Dispenser Filters | 1. Inspect filter and ensure filter is clean and free of fuel and that filter is labeled with a legible installation date.
 | Monthly | OM | OM | OM |
|  | 1. Replace dispenser filters annually or when a change in flow rate is noted.
 | Annually or as needed | SM | SM | SM |
| Dispenser Strainer (Section 7-10) |
| Dispenser Strainers | 1. Inspect and clean strainers. Inspect strainer cover gasket for cracks, distortion, and dry rot. If breaks are detected in strainer mesh, replace the strainer.
 | Annually | SM | SM | SM |
| **GROUND FUEL PIPING** |
| Ground Vehicle Fuel Piping (Section 7-11) |
| Ground Vehicle Fuel Piping | 1. Visually inspect aboveground lines for leaks. Shut down systems that are found with leaks and repair.
 | Daily | OM | OM | OM |
| 1. Visually inspect leak detection systems installed on underground piping. Inspections include line leak detectors and leak detection sensors installed in transition sumps and dispenser sumps.\**2**\ /**2**/
 | Monthly | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ |
| 1. Perform leak testing on pressurized underground piping with installed leak detection equipment and record results.
2. Test leak detection systems installed on underground piping used for ground vehicle petroleum fuel products. Underground leak detection systems include discrete detection sensors installed in transition and dispenser sumps, and line leak detectors installed at the outlet of pumps used to supply pressurized liquid petroleum fuel to underground lines. Repair faulty components. Execution of this work may require state certification or license.
3. Conduct service station aboveground piping annual test as outlined in Appendix G – Petroleum Fuel Pipeline Pressure Testing Guidelines and Criteria. Execution of this work may require state certification or license.
4. /**2**/Conduct service station underground piping annual test outlined in Appendix G – Petroleum Fuel Pipeline Pressure Testing Guidelines and Criteria. Execution of this work may require state certification or license.
 | Annually | SM | SM | SM |
| 1. Refer to [Section 2.7 Signage and Markings](#Signage_and_Markings) for inspection and maintenance requirements of ground vehicle petroleum fuel pipe markings.
2. Refer to [Section 6-10.1 Aboveground Piping and Equipment Coatings](#Aboveground_Piping_and_EquipmentCoatings) for inspection and maintenance requirements of ground vehicle petroleum fuel pipe coatings.
 | As required | SM | SM | SM |
| Emergency Shutoff Valves (Shear Valves) (Section 7-12) |
| Emergency Shutoff Valves (Shear Valves) | 1. Inspect stabilizer bar to ensure that it is securely mounted below the base of the dispenser. Inspect the mounting bolts that secure the emergency shutoff valve to the stabilizer bar.
2. Inspect fusible link and ensure it is not obstructed. Ensure valve body is clean and free of fuel.
 | Monthly | OM | OM | OM |
| 1. Inspect mechanical links of the valve for correct operation. Conduct test of valve to ensure it operates correctly. Execution of this work may require state certification or license.
 | Annually | SM | SM | SM |
| Dispenser Sumps (Section 7-13) |
| Dispenser Sumps | 1. Inspect for signs of water, fuel, trash, and debris inside sumps. Remove and properly dispose of collected water, fuel, trash, and debris. Visually inspect penetration fittings. If fuel or water is detected investigate the source and repair.
 | Monthly | OM | OM | OM |
| 1. Inspect sump pipe transition fittings for tears, cracks, or other signs of deterioration. Check hose clamp seals to ensure they are securely tightened.
 | Quarterly | SM | SM | SM |
| 1. Test dispenser sumps and ensure they are liquid tight by using vacuum, pressure, or liquid testing in accordance with 40 CFR 280, Section 43.
 | Every three years | SM | SM | SM |
| Transition Sumps (Section 7-14) |
| Transition Sumps | 1. Inspect for signs of water, fuel, trash, and debris inside sumps. Remove and properly dispose of collected water, fuel, trash, and debris. Visually inspect penetration fittings. If fuel or water is detected investigate the source and repair.
 | Monthly | OM | OM | OM |
| 1. Inspect sump pipe transition fittings for tears, cracks, or other signs of deterioration. Check hose clamp seals to ensure they are securely tightened.
 | Quarterly | SM | SM | SM |
| 1. Test sumps and ensure they are liquid tight by using vacuum, pressure, or liquid testing in accordance with 40 CFR 280, Section 43.
 | Every three years | SM | SM | SM |
| **DISPENSER PUMPS** |
| Remote Dispenser Pumps (Section 7-15.1) |
| Remote Dispenser Pumps | 1. Refer to [Section 7-19.1.2 Automatic Line Leak Detector](#Automatic_Line_Leak_Detector) for maintenance and inspection requirements of automatic line leak detectors installed on submersible turbine pumps.
2. Refer to Section [3-8.1.3 Vertical Turbine/Submerged Turbine Pumps](#Vertical_Turbine_Submerged_Pumps) for inspection and maintenance requirements of remote dispenser pumps.
 | As required | SM | SM | SM |
| Self-Contained Dispenser Pumps (7-15.2) |
| Self-Contained Dispenser Pumps | 1. Inspect self-contained dispenser pump v-belt drives for proper tension and excess wear. Replace belt as recommended by manufacturer.
2. Inspect pump body. Ensure pump body is clean and free of fuel. Inspect air eliminator. Ensure air eliminator is clean and free of fuel and that the vent tube is not obstructed.
 | Monthly | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ | SM |
| **EFSO SYSTEMS** |
| EFSO Systems (Section 7-16) |
| EFSO Systems | 1. Check the operation of the EFSO system by activating the fueling system and then pressing each of the EFSO buttons. Ensure that each button disables power to all of the dispensers and fuel pumps installed at the service station.
 | Quarterly | SM | SM | SM |
| 1. Refer to [Section 2-7 Signage and Markings](#Signage_and_Markings) for inspection and maintenance requirements of EFSO pushbutton signs.
 | As required | SM | SM | SM |
| **VAPOR RECOVERY** |
| Stage I Vapor Recovery (Section 7-17.1) |
| Stage I Vapor Recovery | 1. Inspect vapor recovery hoses for gouges, cuts or outside wear that may result in vapor leaks
 | Daily or before each use | OM | OM | OM |
| 1. Inspect caps and camlock fittings for tightness and leaks.
 | Quarterly | SM | SM | SM |
| 1. Refer to [Section 7-11 Ground Vehicle Fuel Piping](#GROUND_VEHICLE_FUEL_PIPING) for inspection and maintenance requirements of Stage I vapor recovery piping.
 | As required | SM | SM | SM |
| \**2**\ Stage II Vapor Recovery (Section 7-17.2) |
| Stage II Vapor Recovery | 1. There are several approved vendors for Stage II Vapor Recovery systems. Consult the manufacturer's operation and maintenance manual provided with the system for periodic maintenance requirements.
 | Per manufacturer's specifications | SM | SM | SM /**2**/ |
| Vapor Burners (Section 7-17.3) |
| Vapor Burners | 1. Inspect vapor burners to ensure that the pilot flame system is operating properly. Fans, duct work, and dampeners must also be inspected to ensure proper air to fuel vapor mixtures allow for complete burns.
2. Inspect burner knock out pots for condensed fuel vapors and water if equipped.
3. Inspect thermowells and gas detection monitors for operability.
 | Quarterly | SM | SM | SM |
| **ELECTRONIC RELEASE DETECTION MONITORING** |
| Point Sensor - Dry (Section 7-19.1.1) |
| Point Sensor - Dry | 1. Ensure the monitoring panel associated with the point sensor(s) is powered on and no alarms are present.
 | Quarterly | OM | OM | OM |
| 1. Ensure monitoring space is clear and free of debris and liquid
 | Monthly | OM | OM | OM |
| 1. Test sensor and ensure it is functional.
 | Annually | SM | SM | SM |
| Automatic Line Leak Detector (Section 7-19.1.2) |
| Automatic Line Leak Detector | 1. Ensure the monitoring panel associated with the detector(s) is powered on and no alarms are present.
 | Daily | OM | OM | OM |
| 1. Simulate a 3 gallons per hour leak at 10 pounds per square inch; the automatic line leak detector must activate within one hour. A licensed and/or certified technician is required to, test, troubleshoot, or calibrate for operation.
 | Annually | SM | SM | SM |
| Visual Monitoring (Section 7-20.1) |
| Visual Monitoring | 1. Visually inspect at inspection ports for signs of leaks. Remove debris or foreign objects obstructing the view.
 | Weekly | OM | OM | OM |
| **STORAGE TANKS** |
| Aboveground Field-Erected Tanks (Section 8-4) |
| Aboveground Field-Erected Tanks | 1. Visually inspect for evidence of leaks; shell distortions; signs of settlement; corrosion, condition of tank foundation, condition of coating, insulation systems, and appurtenances. Inspection must include all components and equipment located inside the containment area such as piping, pipe supports, containment valves, and product saver tanks. Items noted during the inspection will be documented for follow-up action by an authorized inspector. See [Appendix F](#APPENDIX_F) for the Field-Erected Tank Monthly Inspection Checklist.
2. Visually inspect chime to ringwall sealant. Seal should be maintained in good working order to prevent corrosion of the underside of the tank bottom.
 | Monthly | OM | OM | OM |
| 1. Visually inspect the exterior of the tank for leaks, corrosion, or irregularities such as tilting, settling, or out-of-roundness. Give special attention to seams and anchor bolts. Visual inspection must include all components and equipment located inside the tank containment area such as piping, pipe supports, containment valves, and product saver tanks. Retain records of inspections reports for five years. See [Appendix F](#APPENDIX_F) for the Field-Erected Tank Annual Inspection Checklist.
 | Annually | OM | OM | OM |
| 1. Perform a formal in-service external inspection of the tank in accordance with API 653 or STI SP001 to evaluate the tank for conditions which may affect the operational integrity of the storage tank, including minimum shell thickness measurements. This inspection must be performed by an applicable certified inspector. Inspection must include all components and equipment located inside the tank containment area such as piping, pipe supports, containment valves, and product saver tanks.
 | Every five years or as required by an appropriately certified tank inspector in the previous API 653 or STI SP001 inspection report. | SM | SM | SM |
| 1. Perform an out-of-service API 653 or STI SP001 inspection to evaluate the tank for conditions which may affect the operational integrity of the tank floor, shell, roof and floating roof or pan. API 653 or STI SP001 provides a checklist to be used as part of the assessment. This inspection must be performed by an appropriately certified API 653 or STI SP001 inspector. Inspection must include all components and equipment located inside the tank containment area such as piping, pipe supports, containment valves, and product saver tanks. \**2**\ The API 653 or STI SP001 inspector must recommend the date of the next inspection. The inspection interval must be based on the date the Suitability for Service Letter is issued immediately prior to when the tank is returned to service. /**2**/
 | \**2**\ As recom-mended by the API 653/STI SP001 inspector. If there is not a previous recom- mendation, the inspection must be performed within ten years after the tank was placed into operation. /**2**/ | SM | SM | SM |
| Geodesic Dome Roofs (Section 8-4.2) |
| Geodesic Dome Roofs | 1. Conduct external inspection of geodesic dome roofs, where accessible, for corrosion of tank-to-shell bolts, gasket connections, visible signs of corrosion, apparent roof leaks, clogging or deterioration of vent screens, and damage to the structure or panels.
 | Monthly | OM | OM | OM |
| 1. Conduct internal inspection of geodesic dome roofs from the floating roof, where accessible, for corrosion of tank-to-shell bolts, gasket connections, visible signs of corrosion, apparent roof leaks, clogging or deterioration of vent screens, and damage to the structure or panels.
 | Annually | OM | OM | OM |
| Foundations (Section 8-4.3) |
| Foundations | 1. Inspect visible components of tank foundations for signs of erosion due to heavy rains, wash-down, etc. and repaired as necessary. Also inspect tank foundations for structural cracks, signs of settlement, spalling, or general deterioration. Remove vegetation found around the tank foundation.
 | Monthly | OM | OM | OM |
| Aboveground Shop Fabricated Tanks (Section 8-5.1) |
| Aboveground Shop Fabricated Tanks | 1. Monthly External Inspection (Identified as P in \**1**\STI SP001/**1**/): Visually inspect for exterior signs of corrosion or coating deterioration. Visually inspect weld seams, tank-to-saddle connections, tank supports, tank anchors, foundation and anchor bolts, overfill valves and alarms, normal vents, emergency vents, leak detection probe or water/petroleum accumulation in the interstice on double-walled tanks, leaking valves, fittings, or components, spill containment systems and release prevention barriers. Leaking valves, fittings or components must be repaired immediately or immediately removed from service and isolated to prevent further discharge. Any irregularities, (e.g., missing valve handles, bolts, nuts, screens) will be assessed for priority and repaired as soon as possible or as required depending on the nature of the defect (See [Appendix E](#APPENDIX_E) for an example of the STI SP001 Standard Monthly Inspection Checklist).
 | Monthly | OM | OM | OM |
| 1. Annual External Inspection (Identified as P in \**1**\STI SP001/**1**/): A more detailed examination of the tank and appurtenances must be performed on an annual basis (See [Appendix E](#APPENDIX_E) for an example of the STI SP001 Standard Annual Inspection Checklist).
 | Annually | OM | OM | OM |
| 1. Formal External Inspection (Identified as E in\**1**\STI SP001 /**1**/): A formal external inspection as defined in STI SP001 *Standard for the Inspection of Aboveground Storage Tanks* must be conducted by certified STI SP001 inspector.
2. Formal Internal Inspection (Identified as I in\**1**\STI SP001 /**1**/): A formal internal inspection as defined in STI SP001 *Standard for the Inspection of Aboveground Storage Tanks* must be performed by a certified STI SP001 inspector. \**2**\ The API 653 or STI SP001 inspector must recommend the date of the next inspection. The inspection interval must be based on the date the Suitability for Service Letter is issued immediately prior to when the tank is returned to service. /**2**/
3. Leak Test (Identified as L in \**1**\STI SP001 /**1**/): A leak test as defined in STI SP001 *Standard for the Inspection of Aboveground Storage Tanks* must be performed in accordance with STI SP001 *Standard for the Inspection of Aboveground Storage Tanks*.
 | As established by SCP based on tank size and category listed in \**1**\STI SP001 /**1**/ | SM | SM | SM |
| Self-Diking or Vaulted Tanks (Section 8-5.2) |
| Self-Diking or Vaulted Tanks | 1. Monthly External Inspection (Identified as P in \**1**\STI SP001 /**1**/): Visually inspect for exterior signs of corrosion or coating deterioration. Visually inspect weld seams, tank-to-saddle connections, tank supports, tank anchors, foundation and anchor bolts, overfill valves and alarms, normal vents, emergency vents, leak detection probe or water/petroleum accumulation in the containment area, leaking valves, fittings, or components. Leaking valves, fittings or components must be repaired immediately or immediately removed from service and isolated to prevent further discharge. Any irregularities, (e.g., missing valve handles, bolts, nuts, screens) will be assessed for priority and repaired as soon as possible or as required depending on the nature of the defect (See [Appendix E](#APPENDIX_E) for an example of the STI SP001 Standard Monthly Inspection Checklist).
 | Monthly | OM | OM | OM |
| 1. Annual External Inspection (Identified as P in \**1**\STI SP001/**1**/): A more detailed examination of the tank and appurtenances must be performed annually. (See [Appendix E](#APPENDIX_E) for an example of the STI SP001 Standard Annual Inspection Checklist).
 | Annually | \**2**\ SM /**2**/ | OM | \**2**\ SM /**2**/ |
| 1. Formal External Inspection (Identified as E in \**1**\STI SP001 /**1**/): A formal external inspection as defined in STI SP001 *Standard for the Inspection of Aboveground Storage Tanks* must be conducted by certified STI SP001 inspector.
2. Formal Internal Inspection (Identified as I in \**1**\STI SP001 /**1**/): A formal internal inspection as defined in STI SP001 *Standard for the Inspection of Aboveground Storage Tanks* must be performed by a certified STI SP001 inspector.
3. Leak Test (Identified as L in \**1**\STI SP001/**1**/): A leak test as defined in STI SP001 *Standard for the Inspection of Aboveground Storage Tanks* must be performed in accordance with STI SP001 *Standard for the Inspection of Aboveground Storage Tanks*.
 | As established by SCP based on tank size and category listed in \**1**\STI SP001 /**1**/ | SM | SM | SM |
| Rectangular Concrete-Encased Tanks (Section 8-5.3) |
| Rectangular Concrete-Encased Tanks | 1. Monthly External Inspection (Identified as P in \**1**\STI SP001 /**1**/): Visually inspect tank supports, anchors and anchor bolts, overfill valve and alarms, normal vent, emergency vent, leaking valves, fittings or other components. In addition the exterior concrete must be visually inspected for cracking, degradation, excessive calcareous deposits or signs of damage. Leaking valves, fittings or components must be repaired immediately or isolated to prevent further discharge. Any other deficiencies or irregularities noted must be repaired as soon as possible or as required depending on the nature of the defect (See [Appendix E](#APPENDIX_E) for an example of the STI SP001 Standard Monthly Inspection Checklist)..
 | Monthly | OM | OM | OM |
| 1. Annual External Inspection (Identified as P in \**1**\STI SP001 /**1**/): A more detailed examination of the tank and appurtenances must be performed on an annual basis (See [Appendix E](#APPENDIX_E) for an example of the STI SP001 Standard Annual Inspection Checklist).
 | Annually | SM | SM | SM |
| 1. Formal External Inspection (Identified as E in \**1**\STI SP001 /**1**/): A formal external inspection must be conducted by certified STI SP001 inspector.
2. Formal Interior Inspection (Identified as I in \**1**\STI SP001 /**1**/): A modified formal internal inspection as defined in manufacturer’s instructions or STI SP001 *Standard for the Inspection of Aboveground Storage Tanks* must be performed on concrete-encased tanks by a certified STI SP001 inspector if the tank interior is accessible.
 | As established by SCP based on tank size and category listed in \**1**\STI SP001 /**1**/ | SM | SM | SM |
| Underground Single-walled Shop-Fabricated Tanks (Section 8-5.4.1) |
| Underground Single-walled Shop-Fabricated Tanks | 1. Monthly External Inspection (Identified as P in Table 8-\**1**\1/**1**/): Ensure all tank port covers are present, are in good condition, and seated firmly on the correct tank. Inspect tank stick gauge and ensure markings are legible and that the stick gauge is not warped or broken. Inspect tank for water using ATG or stick gauge with water-finding paste. Remove water found in tank. Open and inspect tank-top containment sumps and ensure no fuel or water is collected in the sumps. Check for and remove obstructions in tank fill pipe.
 | Monthly | OM | OM | OM |
| 1. Annual External Inspection (Identified as P in Table 8-\**1**\1/**1**/): Inspect electrical connections and junction boxes in underground sumps and access ports on tank. Ensure boxes are sealed, and that boxes, conduit, and electrical fittings are not corroded. Inspect submerged turbine pumps if present. Ensure pumps are in good condition and that pumps and fittings show no signs of leaking. Inspect tank top containment sumps for cracks, holes, and budges. Ensure tank top containment sump electrical and pipe penetrations are intact and secured. For double-walled piping systems that drain into the tank top containment sump, ensure interstitial space of piping is open and that sump sensor is properly mounted at the bottom of the sump. Ensure tank top containment sump lid gasket and seals are in good condition. Inspect road access covers. Ensure covers are in good condition, that all bolts are present and that handles and lift mechanism is in good condition as applicable. Inspect concrete installed over tank and ensure there is no significant cracking.
 | Annually | SM | SM | SM |
| 1. Tank Tightness Test (Identified as T in Table 8-\**1**\1/**1**/): Perform test in accordance with 40 CFR 280, Section 43.
 | As established by SCP based on tank size and release detection type listed in Table 8-\**1**\1/**1**/. | SM | SM | SM |
| 1. Formal Internal Inspection (Identified as I in Table 8-1): A formal modified internal inspection in accordance with STI SP001 *Standard for the Inspection of Aboveground Storage Tanks* must be conducted by a certified STI SP001 inspector if the interior is accessible. The inspector will need to supplement and/or adapt portions of STI SP001 to evaluate the specific concerns of an underground tank. Check the tank for settlement and ensure that the tank slopes towards the water drain.
 | As established by SCP based on tank size and release detection type listed in Table 8-\**1**\1/**1**/ or as recommended by an STI SP001 certified tank inspector in the previous inspection report. | SM | SM | SM |
| 1. Test tank-top containment sumps and ensure they are liquid tight by using vacuum, pressure, or liquid testing in accordance with 40 CFR 280, Section 43.
 | Every three years | SM | SM | SM |
| Underground Double-walled Shop-Fabricated Tanks (Section 8-5.4.2) |
| Underground Double-walled Shop-Fabricated Tanks | 1. Monthly External Inspection (Identified as P in Table 8-\**1**\2/**1**/): Ensure all tank port covers are present, are in good condition, and seated firmly on the correct tank. Inspect tank stick gauge and ensure markings are legible and that the stick gauge is not warped or broken. Inspect tank for water using ATG or stick gauge with water-finding paste. Remove water found in tank. Open and inspect tank-top containment sumps and ensure no fuel or water is collected in the sumps. Check for and remove obstructions in tank fill pipe.
 | Monthly | OM | OM | OM |
| 1. Annual External Inspection (Identified as P in Table 8-\**1**\2/**1**/): Inspect electrical connections and junction boxes in underground sumps and access ports on tank. Ensure boxes are sealed, and that boxes, conduit, and electrical fittings are not corroded. Inspect submerged turbine pumps if present. Ensure pumps are in good condition and that pumps and fittings show no signs of leaking. Inspect tank top containment sumps for cracks, holes, and budges. Ensure tank top containment sump electrical and pipe penetrations are intact and secured. For double-walled piping systems that drain into the tank top containment sump, ensure interstitial space of piping is open and that sump sensor is properly mounted at the bottom of the sump. Ensure tank top containment sump lid gasket and seals are in good condition. Inspect road access covers. Ensure covers are in good condition, that all bolts are present and that handles and lift mechanism is in good condition as applicable. Inspect concrete installed over tank and ensure there is no significant cracking.
 | Annually | SM | SM | SM |
| 1. Formal Internal Inspection (Identified as I in Table 8-\**1**\2/**1**/): A formal modified internal inspection in accordance with STI SP001 *Standard for the Inspection of Aboveground Storage Tanks* must be conducted by a certified STI SP001 inspector if the interior is accessible. The inspector will need to supplement and/or adapt portions of STI SP001 to evaluate the specific concerns of an underground tank. Check the tank for settlement and ensure that the tank slopes towards the water drain.
 | As established by SCP based on tank size and release detection type listed in Table 8-\**1**\2 /**1**/ or as recommended by an STI SP001 certified tank inspector in the previous inspection report. | SM | SM | SM |
| 1. Test tank-top containment sumps and ensure they are liquid tight by using vacuum, pressure, or liquid testing in accordance with 40 CFR 280, Section 43.
 | Every three years | SM | SM | SM |
| Underground Field-Constructed Tanks (Cut and Cover Tanks) (Section 8-6) |
| Underground Field-Constructed Tanks  | 1. Check the level gauge records and interstitial monitoring ports to determine if the tank is leaking.
 | Daily | OM | OM | OM |
| 1. Apply field-erected tank monthly external inspection to the maximum extent possible. Visually inspect tank and appurtenances for eviden- ce of leaks, shell distortions, signs of corrosion, and settlement at accessible locations. Items noted during the inspection will be docu- mented for follow-up action by an authorized inspector (See [Appendix F](#APPENDIX_F) for the Field-Erected Tank Month- ly Inspection Checklist).
2. Check tank under static storage conditions for 24 hours using exist- ing inventory management system to determine if petroleum losses are occurring. If leakage is noted, further investigation must be con- ducted in accordance with Military service-specific guidelines.
 | Monthly | OM | OM | OM |
| 1. Apply field-erected tank annual ex- ternal inspection to the maximum extent possible. Visually inspect tank and appurtenances for eviden- ce of leaks, shell distortions, signs of corrosion, and settlement at ac- cessible locations. Visually inspect pump/equipment vaults for leaks and cracking in concrete walls and floors. Retain records of inspec- tions reports for five years (See [Appendix F](#APPENDIX_F) for the Field-Erected Tank Annual Inspection Checklist).
 | Annually | SM | SM | SM |
| 1. Perform a modified out-of-Service API 653 internal inspection to eval- uate the tank for conditions which may affect the operational integrity of the tank floor, shell, columns and roof by certified API 653 inspector. API 653 provides a checklist to be used as part of the assessment; however the certified API 653 ins- pector must modify this checklist to incorporate specific needs of under- ground field-constructed tanks.
 | Every ten years or as recommended by an appropriately certified tank inspector in the previous API 653 inspection report. | SM | SM | SM |
| Tank Cleaning (Section 8-7) |
| Tank Cleaning  | 1. Conduct Tank Cleaning: Unless otherwise mandated by operational concerns or military service directives, schedule and conduct tank cleaning based upon the frequency listed below. After cleaning tanks must be stenciled in accordance with [Section 8-8.1 Tank Stenciling Requirements](#Tank_Stenciling_Requirements).
 | a. Air Force – Tanks above 20,000 gallon (75,700 liters) in capacity - Every 10 years unless required more frequently due to fuel quality issues. Contact AFPET and AF Fuel SME for deviations on schedule. Schedule changes are typically accepted based on TO 42B1-1 requirements. b. Air Force – Tanks 20,000 gallon (75,700 liters) in capacity and under - During out of service inspection cycle unless required more frequently due to potential fuel quality issues.c. Army, Navy, U.S. Marine Corps – During out-of-service inspection cycle unless required more frequently due to potential fuel quality issues. | SM | SM | SM |
| Aluminum Honeycomb Floating Pan (Section 8-9.1.1) |
| Aluminum Honeycomb Floating Pan | 1. Visually inspect pan guide/anti-rotation cables and centering of pan.
2. Visually inspect pan grounding cables for proper attachment and wear or binding.
3. Visually inspect for buckling or damage to the pan.
 | Monthly | OM | OM | OM |
| 1. Inspect grounding cables for proper attachment and wear or binding.
2. Inspect all floating roof penetration seals, such as ladder seals, stilling well seals, and other seals to ensure that they are in good working condition.
 | Annually | SM | SM | SM |
| 1. Clean and inspect perimeter tank/pan seals.
 | At time of out of service internal inspection | SM | SM | SM |
| 1. Refer to [Section 8-9.1.5 Floating Roof and Pan Pressure/Vacuum Vents](#Floating_Roof_and_PanPressureVacuumVents) for inspection and maintenance requirements of floating pan pressure/vacuum vents.
2. Refer to [Section 8-9.1.6 Floating Roof and Pan Legs](#Floating_Roof_and_PanLegs) for inspection and maintenance requirements of floating pan legs.
 | As required | SM | SM | SM |
| Steel Floating Pan (Section 8-9.1.2) |
| Steel Floating Pan | 1. Visually inspect pan guide/anti-rotation cables and centering of pan.
2. Visually inspect pan grounding cables for proper attachment and wear or binding.
3. Visually inspect for buckling or damage to the pan.
4. Visually inspect for damage or deflection in the rolling ladder (if equipped).
 | Monthly | OM | OM | OM |
| 1. Inspect grounding cables for proper attachment and wear or binding.
2. Inspect all floating pan penetration seals, such as gauge well seals to ensure that they are in good working condition.
3. Inspect gauge wells for abrasions that might indicate out of roundness, or improper centering.
4. Inspect vertical ladder for abrasions that might indicate out of roundness, or improper centering (if equipped).
5. Inspect for damage or deflection in the rolling ladder (if equipped).
 | Annually | SM | SM | SM |
| 1. Clean and inspect perimeter tank/pan seals.
 | At time of out of service internal inspection | SM | SM | SM |
| 1. Refer to [Section 8-9.1.5 Floating Roof and Pan Pressure/Vacuum Vents](#Floating_Roof_and_PanPressureVacuumVents) for inspection and maintenance requirements of floating pan pressure/vacuum vents.
2. Refer to [Section 8-9.1.6 Floating Roof and Pan Legs](#Floating_Roof_and_PanLegs) for inspection and maintenance requirements of floating pan legs.
 | As required | SM | SM | SM |
| Pontoon Floating Pan (Section 8-9.1.3) |
| Pontoon Floating Pan | 1. Visually inspect pan guide/anti-rotation cables or pipes and centering of pan.
2. Visually inspect pan grounding cables for proper attachment and wear or binding.
3. Visually inspect for buckling or damage to the pan.
4. Visually inspect for damage or deflection in the rolling ladder (if equipped).
 | Monthly | OM | OM | OM |
| 1. Inspect pontoons for standing liquid and presence of strong vapors.
2. Remove mechanical gauge float cover and ensure float is securely fastened to gauge tape. Check gauge tape for ease of movement.
3. Inspect for damage or deflection in the rolling ladder (if equipped).
4. Inspect vertical internal ladder and internal ladder/pan seals for abrasions that might indicate out of roundness, or improper centering (if equipped).
5. Inspect gauge wells and gauge well/pan seals for abrasions that might indicate out of roundness, or improper centering.
6. Inspect steel floating pan coatings for corrosion. Touch up with compatible coating if required (aluminum pans do not require coatings).
 | Annually | SM | SM | SM |
| 1. Clean and inspect perimeter tank/pan seals.
 | At time of out of service internal inspection | SM | SM | SM |
| 1. Refer to [Section 8-9.1.5 Floating Roof and Pan Pressure/Vacuum Vents](#Floating_Roof_and_PanPressureVacuumVents) for inspection and maintenance requirements of floating pan pressure/vacuum vents.
2. Refer to [Section 8-9.1.6 Floating Roof and Pan Legs](#Floating_Roof_and_PanLegs) for inspection and maintenance requirements of floating pan legs.
 | As required | SM | SM | SM |
| Floating Roof (Section 8-9.1.4) |
| Floating Roofs | 1. Visually inspect the center primary roof drain system is water-free
2. Visually inspect anti-rotation pipes/roof guides and centering of roof.
3. Visually inspect grounding cables for proper attachment and wear or binding.
4. Visually inspect for buckling or damage to the roof.
5. Visually inspect for standing water on roof deck.
6. Visually inspect for damage or deflection in the rolling ladder (if equipped).
 | Monthly | OM | OM | OM |
| 1. Ensure that the drip-tight plug is placed in the roof drain opening.
2. Ensure that the roof drain valve is closed. The drain valve is kept in the closed position except after each rain or snowfall when it is opened just long enough to drain the roofline. Tanks with retrofitted geodesic domes or metal roofs may have had the floating roof drain line removed, so before opening the roof drain valve ensure the roof drain line has not been removed.
3. Inspect pontoons for standing liquid and presence of strong vapors.
4. Remove mechanical gauge float cover and ensure float is securely fastened to gauge tape. Check gauge tape for ease of movement.
5. Ensure emergency drain (if equipped) is not blocked with debris.
6. Inspect for damage or deflection in the rolling ladder (if equipped).
7. Inspect vertical internal ladder and internal ladder/roof seals for abrasions that might indicate out of roundness, or improper centering (if equipped).
8. Inspect gauge wells and gauge well/roof seals for abrasions that might indicate out of roundness, or improper centering.
9. Inspect the floating roof coating for corrosion. Touch up with compatible coating if required.
 | Annually | SM | SM | SM |
| 1. Clean and inspect perimeter tank/pan seals.
 | At time of out of service internal inspection | SM | SM | SM |
| 1. Refer to [Section 8-9.1.5 Floating Roof and Pan Pressure/Vacuum Vents](#Floating_Roof_and_PanPressureVacuumVents) for inspection and maintenance requirements of floating roof pressure/vacuum vents.
2. Refer to [Section 8-9.1.6 Floating Roof and Pan Legs](#Floating_Roof_and_PanLegs) for inspection and maintenance requirements of floating roof legs.
 | As required | SM | SM | SM |
| Floating Roof and Pan Pressure/Vacuum Vents (Section 8-9.1.5) |
| Floating Roof and Pan Pressure/ Vacuum Vents | 1. Inspect the floating roof or pan pressure/vacuum vent to ensure that the seats and retaining straps or guides are in good working order and that the pressure/vacuum vent is not stuck to its seats, but instead lift easily off of its seats and reseats properly. Inspect gaskets for wear and replace as required. Refer to the manufacturer’s operation and maintenance manual provided with the floating roof or pan for additional guidance on servicing the pressure/vacuum vent.
 | At time of out of service internal inspection | SM | SM | SM |
| Floating Roof and Pan Legs (Section 8-9.1.6) |
| Floating Roof and Pan Legs | 1. Inspect the floating roof or pan legs and tank bottom striker plates for wear; inspect the seals where the legs penetrate the floating roof or pan for leaks; inspect the low leg position stops to make sure they are securely fastened to the legs and will stop the floating roof or pan at the low position; inspect the leg keeper straps to make sure they are securely fastened to the legs to prevent the legs from falling off or through the floating roof or pan; inspect the threaded keeper caps or high position locking mechanisms to ensure they are in proper working order for securing the floating roof or pan in the high position. Refer to the maintenance manual provided with the floating roof or pan for additional guidance on floating roof or pan legs and associated hardware.
 | At time of out of service internal inspection | SM | SM | SM |
| Secondary Tank Bottoms (Section 8-9.2) |
| Secondary Tank Bottoms | 1. Tanks designed with secondary tank bottoms should have tell-tale devices (leak detection ports) to allow for monitoring of the tank’s floor integrity. The tell-tale devices are typically configured as valves or inspection ports to allow for visual monitoring of liquid that may be present between the foundation and the tank floor. The presence of water would indicate a breach in the foundation seals or flooring while the presence of petroleum would indicate integrity loss in the tank floor. Open and check tell-tale valves or inspection ports. Verify the absence of water or petroleum.
 | Monthly | OM | OM | OM |
| Tank Pressure/Vacuum Vents (Section 8-9.3) |
| Tank Pressure/ Vacuum Vents | 1. On underground shop fabricated tanks, ensure tank pressure/vacuum vent is present and that the riser pipe is securely supported and vertical.
 | Annually | OM | OM | OM |
| 1. Inspect vent settings. Pressure and vacuum settings for pressure/vacuum vents are usually specified on the vent nameplate or in the manufacturer’s manual for the vent.
2. Clean the pressure/vacuum vent. Information on the type of pressure/vacuum vent and proced- ures for the removal of covers, hoods and/or pallet removal and reinstallation should be found in the manufacturer’s operation and maintenance manual. Before removing the pallets, brush all accumulations from the protecting screens, the pallets, and all surfaces of the valve. Brush the screens from inside the valve so that dirt and other objects fall to the outer sides. Remove heavy loading weights prior to removing the pallet assembly. Remove deposits or foreign matter using reasonable care not to damage diaphragms or seats.
3. Inspect gaskets, seats, diaphragm, pallet stems and stem guides. Check all mating surfaces which must be free of nicks, cuts, cracks or deposits that might interfere with the proper seating or tightness of the valve. Test the pallets to ensure they move freely up and down over the full range of travel.
 | Annually | SM | SM | SM |
| Emergency Vents (Section 8-9.4) |
| Emergency Vents | 1. \**2**\ Inspect emergency vents for external damage, such as dents, rusting, severe pitting, or obstruction by other equipment, piping, or conduits.
 | Annually | OM | OM | SM /**2**/ |
| 1. Remove the vent, if possible, and inspect the seals and diaphragms for cracking or breakdown. Inspect retaining cables to ensure they are fastened to the vent and the manway or tank. Inspect guides to ensure emergency vents can function properly and re-seat.
2. Verify that emergency vents have not been removed or modified. Emergency vents should not be replaced with ATGs, manual sample ports, level alarms, etc.
3. Tanks that are equipped with manways for emergency vents must be inspected for appropriate type, length, number of bolts, and lift clearance of the manway in accordance with UL 142 Standard for *Steel Aboveground Tanks for Flammable and Combustible Liquids*, Section 8 and 9.
 | Annually | SM | SM | SM |
| Flame Arrestors (Section 8-9.5) |
| Flame Arrestors | 1. The tube bank must be removed and cleaned of foreign matter by immersing in an approved solvent solution, taking care not to damage the tube bundle. Gaskets must be inspected and replaced as necessary.
 | Annually | SM | SM | SM |
| External High Level Shutoff Valves (HLSO) (Section 8-9.6.1) |
| External High Level Shutoff Valves (HLSO) | 1. Activate the tank high-high level alarm and ensure the solenoid valve (if equipped) activates on the HLSO valve. Ensure the HLSO valve closes when the solenoid valve is activated.
 | Quarterly | SM | SM | SM |
| 1. Isolate, drain, and then vent the external float valve chamber (if equipped). Refill (either manually or via the storage tank product saver tank pump) the float chamber to test the float valve. Ensure the HLSO closes when the float is raised.
2. Lift the manual test lever of internally mounted float valve (if equipped). Ensure that the HLSO closes when the float of the float valve is raised.
 | Annually | SM | SM | SM |
| Internal HLSO Valve (Section 8-9.6.2) |
| Internal HLSO Valves | 1. Inspect and test the high level shut-off valve and float mechanism, counter-weights, float rods, and floats to ensure the float mechanism is moving freely and functioning properly to close the high level shut-off valve. If valve is not equipped with a manual test mechanism the level of the tank must be raised to the high level shutoff valve set point in order to test the valve. Ensure valve is installed at a proper height.
 | Annually | SM | SM | SM |
| Mechanical Tape Gauges (Section 8-9.7) |
| Mechanical Tape Gauges | 1. Visually check that a liquid level is indicated and that the measurement appears to be accurate.
 | Daily | OM | OM | OM |
| 1. Check the mechanical tape gauge against the automatic electronic tank gauge (if installed) or by manually gauging the tank for relative accuracy and proper working condition. Consult the manufacturer’s operation and maintenance manual for additional maintenance and inspection requirements
 | Quarterly | SM | SM | SM |
| **Automatic Tank Gauges**  |
| Mechanically Operated Tape Gauge (Section 8-9.8.1) |
| Mechanically Operated Tape Gauge | 1. Visually inspect the gauge to ensure the power is on, there are no warning alarms or lights and a liquid measurement is indicated and the tank level reading appears to be accurate.
 | Daily | OM | OM | OM |
| 1. Inspect gauge head for buildup of sediment.
2. Inspect tape conduit for deformations that would inhibit movement of tape up and down.
 | Quarterly | SM | SM | SM |
| 1. Gauge level accuracy must be performed against a hand dip measurement of the tank. Calibrate as required.
2. Inspect float and guide cable through an opened manway or access cover. Verify that the guide wire is taut and free of kinks. Verify that the float is buoyant and free of sludge or sediment build up.
3. Inspect power and control wires for damage.
4. Inspect wire connection termination points for damage or loose connections.
 | Semi-annually | SM | SM | SM |
| 1. Lubricate moving parts of the gauge head
 | Annually | SM | SM | SM |
| Magnetostrictive Probes (Section 8-9.8.2) |
| Magnetostricitve Probes | 1. Visually inspect the gauge to ensure the power is on, there are no warning alarms or lights and a liquid measurement is indicated and the tank level reading appears to be accurate.
 | Daily | OM | OM | OM |
| 1. Inspect probe assembly for buildup of sediment.
2. Inspect probe assembly and probe shaft for deformations that would inhibit movement of probe.
 | Quarterly | SM | SM | SM |
| 1. Level probe accuracy must be performed against a hand dip measurement of the tank. Calibrate as required.
2. Verify that the probe float is buoyant and free of sludge or sediment build up.
3. Inspect power and control wires for damage.
4. Inspect wire connection termination points for damage or loose connections.
 | Semi-annually | SM | SM | SM |
| Servo Gauge (Section 8-9.8.3) |
| Servo Gauge | 1. Visually inspect the gauge to ensure the power is on, there are no warning alarms or lights and a liquid measurement is indicated and the tank level reading appears to be accurate.
 | Daily | OM | OM | OM |
| 1. Inspect gauge head for buildup of sediment.
 | Quarterly | SM | SM | SM |
| 1. Gauge level accuracy must be performed against a hand dip measurement of the tank. Calibrate as required.
2. Inspect float and guide cable through an opened manway or access cover. Verify that the guide wire is taut and free of kinks. Verify that the float is buoyant and free of sludge or sediment build up.
3. Inspect power and control wires for damage.
4. Inspect all wire connection termination points for damage or loose connections.
 | Semi-annually | SM | SM | SM |
| 1. Inspect stilling well to be straight and vertical with no dents so that the float can move freely.
2. Lubricate moving parts of the gauge head.
 | Annually | SM | SM | SM |
| **Level ALARMS** |
| Externally Mounted Level Alarms (Section 8-9.9.1) |
| Externally Mounted Level Alarms | 1. Test level alarm switches by isolating the chambers from the tank using the sensing chamber isolation valves. Vent and drain the chambers. Slowly pour product into the chambers through a funnel on top of the chamber to test the level switch at the specified level setting.
 | Semi-annually | SM | SM | SM |
| Internally Mounted Level Alarms (Section 8-9.9.3) |
| Internally Mounted Level Alarms | 1. Test level alarm switches by activating manual testing levers, if equipped. If alarms switches are not equipped with manual testing levers, adjust the level of fuel in the tank to the alarm points in order to test the alarm switches. If it is not feasible to adjust the level of the fuel in the tank to all of the alarm set points, remove the alarm switches from the tank and test the alarms externally. Reinstall alarm switches in the tank once testing is complete.
 | Annually | SM | SM | SM |
| **PRODUCT SAVER TANKS** |
| Product Saver Tanks (Section 8-9.10) |
| Product Saver Tanks | 1. Inspect the product saver tank to ensure all valves are working properly, sight level gauges with density balls are working properly and are not broken, and hand pumps or electric pumps are working properly and are not leaking.
 | Quarterly | SM | SM | SM |
| **SIDESTREAM FILTRATION SYSTEMS** |
| Sidestream Filtration Systems (Section 8-9.11) |
| Sidestream Filtration Systems | 1. Check (typically 5 gallon (19 liters), if incorporated) filter separator vent tank and ensure it is empty.
 | Monthly | OM | OM | OM |
| 1. Refer to [Section 6-1 Pipe Testing and Inspections](#PIPE_TESTING_AND_INSPECTIONS) for inspection and maintenance requirements of piping.
2. Refer to [Section 3-6.4 Basket Strainers](#Basket_Strainers) for inspection and maintenance requirements of basket strainers.
3. Refer to [Section 3-8 Pumps](#PUMPS) for inspection and maintenance requirements of fuel pumps.
4. Refer to [Section 3-6.2 Filter Separators](#Filter_Separators) for inspection and maintenance requirements of filter separators.
5. Refer to [Section 4-4.2.2 Filter Separator Control Valves](#Filter_Separator_Control_Valves) for inspection and maintenance requirements of filter separator control valves.
6. Refer to [Section 9-1.6 Grounding Systems](#Grounding_Systems) for inspection and maintenance requirements of grounding systems.
7. Refer to [Section 9-1.9 Electronic Equipment](#Electronic_Equipment) for inspection and maintenance requirements of control panels.
 | As required | SM | SM | SM |
| **FILL PORTS** |
| Fill Ports (Section 8-9.12) |
| Fill Ports | 1. Ensure fill port covers are installed and are not damaged or broken. Ensure fill port covers are identified by fuel type and are installed on the correct tank. Visually inspect the fill port spill bucket to ensure there are no cracks, budges, or holes. Ensure the spill bucket is clean of dirt, trash, water, and fuel
 | Daily | OM | OM | OM |
| 1. Inspect drain valve in spill bucket and ensure it is in good condition. Ensure the caps installed on the receipt connection points are vapor tight and are not broken, cracked, or chipped. Ensure the poppet valve of the vapor recovery port seals tightly and no vapor is escaping from the tank when the valve is closed.
 | Monthly | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ | SM |
| 1. \**1**\Hydrostatically test fill-port to ensure containment is liquid-tight. Where evaporation is a concern, conduct the testing when this concern would be minimized, such as at night/early morning or during a time of year when this would not be as much of an issue. Record the water level at the start of the 60-minute (minimum) hold period. If the water level drops by 1/8 inch or more, perform and record an investigation to determine the cause and any required repairs. Once repairs are completed, a new test must be completed. Refer to [Appendix B](#APPENDIX_B) for testing procedures and to use to document the testing**./1/** Ensure secondary containment area of fill port is fuel tight. Ensure the manual transfer pump or drain valve is operational.
 | \**1**\Every 3 Years/**1**/ | SM | SM | SM |
| **LEAK DETECTION** |
| Point Sensor - Dry (Section 8-9.13.1) |
| Point Sensor - Dry | 1. Ensure the monitoring panel associated with the point sensor(s) is powered on and no alarms are present.
 | Daily | OM | OM | OM |
| 1. Ensure monitoring space is clear and free of debris and liquid
 | Monthly | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ | \**2**\OM/**2**/ |
| 1. Test sensor and ensure it is functional
 | Annually | SM | SM | SM |
| Point Sensor - Wet (Section 8-9.13.2) |
| Point Sensor - Wet | 1. Ensure the monitoring panel associated to the wet point sensor(s) is powered on and no alarms are present.
 | Daily | OM | OM | OM |
| 1. Ensure level of monitoring fluid is within normal range.
 | Monthly | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ | SM |
| 1. Test sensor and ensure it is functional.
 | Annually | SM | SM | SM |
| Point Sensor – Pressure/Vacuum (Section 8-9.13.3) |
| Point Sensor – Pressure/ Vacuum | 1. Ensure the monitoring panel associated with the pressure/vacuum point sensor(s) is powered on and no alarms are present.
 | Daily | OM | OM | OM |
| 1. Test vacuum sensor for proper operation
 | Annually | SM | SM | SM |
| Visual Leak Detection (Section 8-9.13.4) |
| Visual Leak Detection | 1. Visually inspect leak detection ports (tell-tales) for signs of leaks. If there are debris or objects obstructing the view, appropriate measures must be taken to remove the debris or remedy the obstructions.
 | During routine inspection of other components or monthly, whichever comes first. | OM | OM | OM |
| 1. Visually inspect reinforcement plate tell-tale holes for signs of leaks. Ensure tell-tale holes have not been plugged by debris or a cap. Pack reinforcement plate tell-tales with white grease to prevent insect nesting and buildup of debris
 | Quarterly | OM | OM | OM |
|  |
| **FLOATING SUCTION LINES** |
| Floating Suctions Lines (Section 8-9.14) |
| Floating Suction Lines | 1. Check external floating suction line position indicator to ensure floating suction line is moving freely as the level in the tank rises or falls.
 | Quarterly | SM | SM | SM |
| 1. Inspect cables, floats, and swing joint. Ensure interior of floats have not collected fuel. Ensure cables are securely fastened to anchor points and are in good working order. Ensure the suction pipe flange used to support the swing joint is level and true and that swing joint moves freely up and down and does not bind.
 | When tank is taken out of service for internal cleaning or inspection | SM | SM | SM |
| **HEATING COILS** |
| Steam Type Heating Coils (Section 8-9.16.1) |
| Steam Type Heating Coils | 1. Observe the regulating valve and check it against a thermometer to be sure that it controls the tank temperature within a safe range, usually not over 150 °F (65 °C) for No. 6 burner fuel oil. Steam traps must be inspected for proper operation to ensure condensate is evacuated from the steam coil.
 | At each operation | OM | OM | OM |
| 1. Pressure check heating coils to 10% above normal operating pressure.
 | Annually | SM | SM | SM |
| 1. Steam coils must be cleaned and inspected for visible signs of corrosion or wear when the tank is emptied and cleaned for inspection. All components of the steam heating coils, such as weld joins, support points, valves, temperature wells, control valves, and steam traps must be inspected and checked for proper operation and visible wear or damage. The coil may be carefully pressurized with steam and visually checked for leaks if necessary. Leaks or damage found must be repaired.
 | When the tank is taken down for formal internal inspection or sooner if steam heating coil damage is suspected. | SM | SM | SM |
| Thermal Fluid Type Heating Coils (Section 8-9.16.2) |
| Thermal Fluid Type Heating Coils | 1. Observe the regulating valve and check it against a thermometer to be sure that it controls the tank temperature within a safe range, usually not over 150 °F (65 °C) for No. 6 burner fuel oil. All external valves, fittings, and other components must be inspected for visible signs of leaks during operation.
 | At each operation | OM | OM | OM |
| 1. Pressure check heating coils to 10% above normal operating pressure.
 | Annually | SM | SM | SM |
| 1. When tanks are emptied and cleaned for inspection, the heating coils must be cleaned and inspected for visible signs of corrosion, wear, or damage. The coils can be pressurized and checked for leaks at that time with the thermal heating fluid at normal operating pressure, but at ambient temperature to alleviate possible burns to personnel. Leaks must be repaired.
 | When the tank is taken down for formal internal inspection or sooner if thermal heating coil damage is suspected. | SM | SM | SM |
| Electric Rod Type Heating (Section 8-9.16.3) |
| Electric Rod Type Heating | 1. Inspect heater to ensure no fluid leakage around the heater to tank connection and that the heater is performing properly.
 | At each operation | OM | OM | OM |
| **STILLING WELLS** |
| Stilling Wells (Section 8-9.17) |
| Stilling Wells | 1. Stilling wells must be visually inspected to be vertically straight and free dents or indentations. Sometimes tank stilling wells are made of bare carbon steel pipe. In these instances the stilling wells must be replaced with aluminum.
2. Inspect floating seals inside stilling wells to ensure they are not worn and are sealing the inside of the stilling well property.
 | At time of out of service internal inspection | SM | SM | SM |
| **CONTAINMENT SYSTEMS** |
| Containment Systems (General) (Section 8-10.1) |
| Containment Systems (General) | 1. Inspect containment systems for cleanliness, if accessible.
 | Daily | OM | OM | OM |
| 1. Secondary containment systems degrade and will collect debris which can clog drainage inlets or prevent drain valves from seating properly. \**1**\Hydrostatically test the drainage systems to include containment drain inlets, drain lines and containment drain valves to ensure the containment is liquid tight. This test may use opportune rainfall by holding rainwater in the containment system for one hour. Where evaporation is a concern, conduct the testing when this concern would be minimized, such as at night/early morning or during a time of year when this would not be as much of an issue. Record the water level at the start of the 60-minute (minimum) hold period. If the water level drops by 1/8 inch or more, perform and record an investigation to determine the cause and any required repairs Record the water level at the start of the 60 minute (minimum) hold period. If the water level drops by 1/8 inch or more, perform and record an investigation to determine the cause and any required repairs. Refer to Appendix B for testing procedures and to use to document the testing

American Concrete International (ACI) Standards 224R “Control of Concrete Cracking” and ACI’s Concrete Repair Manual are two standards that owners/operators can follow to maintain the integrity of the concrete secondary containment.**/1/** | \**1**\Every 3 years/**1**/ | SM | SM | SM |
| Concrete and Cement Brick Dike/Berm Walls and Floors (Section 8-10.2) |
| Concrete and Cement Brick Dike/Berm Walls and Floors | 1. Inspect for vegetation that has taken root in seals or cracks. All vegetation must be removed in all cases to prevent penetration of seals, joints or cracks in the concrete.
2. Inspect walls constructed of bricks for signs of deterioration (e.g., spalling caused by freeze-thaw conditions, cracks, and joint cracks between bricks). Walls constructed of bricks must be patched immediately to prevent further penetration of the wall structure.
 | Daily | OM | OM | OM |
| 1. Inspect walls constructed of concrete for signs of deterioration (e.g., spalling caused by freeze-thaw conditions and cracks). Clean and seal cracks with a fuel resistant sealant.
2. Inspect seals and joints in concrete walls. Joint sealant that has retracted from the joint or become unbonded with the joints must be removed and replaced with fuel resistant sealant.
 | Semi-annually | SM | SM | SM |
| Dike/Berm Floors (Section 8-10.2.2) |
| Dike/Berm Floors | 1. Inspect for vegetation that has taken root in seals or cracks. All vegetation must be removed in all cases to prevent penetration of seals, joints or cracks in the concrete.
 | Daily | OM | OM | OM |
| 1. Inspect floors made of concrete for signs of deterioration (e.g., spalling caused by freeze-thaw conditions and cracks). Clean and seal cracks with a fuel resistant sealant.
2. Inspect joints and seals. Joint sealant that has retracted from the joint or become unbonded with the joints must be removed and replaced with a fuel resistant sealant.
 | Semi-annually | SM | SM | SM |
| Earthen Dike Walls (Section 8-10.3) |
| Earthen Dike Walls | 1. Inspect for vegetation that has taken root. All vegetation must be removed in all cases.
 | Daily | OM | OM | OM |
| 1. Prevent the growth of vegetation inside the containment area. Use fireproof chemicals for sterilization. Only herbicides approved by the Installation Environmental Office must be used.
 | Monthly | OM | OM | OM |
| 1. Inspect for signs of erosion. Inspections should be performed particularly after heavy rains or storms. Repair areas that have deteriorated due to erosion.
 | Quarterly | SM | SM | SM |
| Self-Diking or Vaulted Tank Containment (Section 8-10.4.) |
| Self-Diking or Vaulted Tank Containment | 1. Secondary containment structures on self-diking or vaulted tanks must be inspected visually for integrity breaches with special attention given to pipe penetrat- ions and interstitial drain valves.
 | Daily | OM | OM | OM |
| Flexible Membrane Liners (Section 8-10.5) |
| Flexible Membrane Liners | 1. Remove vegetation growing in the gravel and dirt, taking note if the roots have penetrated the FML.
 | Daily | OM | OM | OM |
| 1. Visibly inspect FMLs where attached to ringwalls, dike walls, concrete piers and other projections for deterioration due to weather or wear and repair as necessary.
2. Visually inspect FMLs covered with smooth rock or gravel for bare spots where the gravel has been washed away due to storms or heavy rains for tears. Replace gravel taking care not to puncture the liner.
3. Visually inspect exposed FML for tears or punctures and repair.
 | \**2**\ Monthly /**2**/  | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ |
| Pipe Penetrations (Section 8-10.6) |
| Pipe Penetrations | 1. Inspect boot seals and mechanical link-type seals for wear and cracking. Ensure the seals are in good working order to seal out water or retain the petroleum product as intended. Repair or replace defective boot and link-seals.
 | \**2**\ Monthly /**2**/  | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ | \**2**\ OM /**2**/ |
| 1. Inspect sealant between pipes and concrete walls, berms, and floors. Sealant that has retracted from the concrete or pipe surfaces must be removed and replaced with new fuel resistant sealant.
 | Semi-annually | SM | SM | SM |
| **ELECTRICAL CONTROL SYSTEMS AND EQUIPMENT** |
| Electrical Equipment (Section 9-1.2) |
| Electrical Equipment | 1. Electrical control systems include: deadman control; ground verifica- tion systems; EFSO operation; con- trol panels, motor control, and pump start/stop buttons. These sys- tems must be tested on a periodic basis to ensure proper operation and functionality. In addition, con- trol system Uninterruptible Power Supplies (UPS) must be inspected and replaced as necessary.
 | Quarterly | SM | SM | SM |
| Power Cables (Section 9-1.3) |
| Power Cables | 1. Visual inspection: Verify that there are no sharp bends. Verify that the cable insulation is intact. Verify that cables are appropriately tagged or otherwise identified. Verify that all connections are tight and not corroded. Open manholes and handholes. Verify that they are not flooded, clogged with debris or infested by pests.
 | Quarterly | SM | SM | SM |
| 1. Insulation resistance test: This test measures the resistance of the insulation with an Insulation Resistance Tester. During the test, the cable will be disconnected from both ends. Acceptable test values are 100 megaohms for cables rated between 120 V to 1000 V. Insulation resistance testing for voltages higher than 1000 V are to be performed by specialized testing company.
 | As needed based on visual inspection | SM | SM | SM |
| Motor Controls (Section 9-1.4) |
| Motor Controls | 1. Verify that the labeling is consistent with the drawings and specifications.
2. Verify that pushbuttons are easy to operate and are not stuck. Verify that there is no grease accumulation around the seating Verify that indicating lights are functional and replace if required.
3. Verify that indicating lights are functional and replace as needed.
4. Verify that electrical and mechanical interlocks operate according to the design intent. In case of key interlocks, ensure that the number of keys corresponds to the interlock intent. Having more keys than required defeats the intent of the interlocking and poses danger to the service personnel and equipment. If extra keys are found, they should be removed from the equipment.
 | Semi-annually | SM | SM | SM |
| 1. Inspect the enclosure for visible signs of corrosion.
 | Interior annually/ exterior semi-annually | SM | SM | SM |
| 1. Open the enclosure – be mindful of insects, rodents and reptiles, particularly if located outdoors. Look for signs of corrosion, dust accumulation, spider webs, etc. Clean the enclosure with compressed air and apply rust inhibitors and paint as needed.
2. Inspect the overcurrent protective devices for proper seating. Verify that rating is appropriate for the motor. Look for signs of attached wire and device overheating.
3. Inspect the arch shoots of contactors and clean as needed. Check that partitions are not burned.
4. Inspect contactors for abnormal wear. Check contacts for pitting, roughness and oxidation. Verify that contact gap, alignment and pressure are in accordance with manufactures recommendations.
5. When contactors are used, listen for the chatter of contacts or buzzing noise. These are indicative of a faulty contactor.
6. Verify that relays and switches are firmly seated in their bases and there are no signs of overheating or vibration.
7. Look for frayed or broken strands in the flexible control wiring and replace if such are found.
8. Perform a functional test of protective devices if they are equipped with self-testing circuits or switches.
9. Perform a functional test of all manual switches and verify proper operation against intended design logic. Replace switches and relays if operation is not satisfactory.
 | Annually | SM | SM | SM |
| 1. Perform insulation resistance test for the control wiring. (NOTE: Testing of the control wires may require substantial down time. Therefore, this should only be performed on a case by case basis if there are reasons to suspect that the insulation of the control wiring is deteriorating.)
 | As required | SM | SM | SM |
| Panelboards (Section 9-1.5) |
| Panelboards | 1. Verify that there are no physical obstructions blocking access to the panelboard. Remove physical obstructions
 | Quarterly | OM | OM | OM |
| 1. Inspect the enclosure and the surrounding area for water damage and corrosion.
2. Verify that all breakers are either in the “On” or the “Off” position. If there are tripped breakers, investigate the cause of the trip.
3. Verify that all breakers are either in the “On” or the “Off” position. If there are tripped breakers, investigate the cause of the trip.
4. Verify that the breaker operation matches the description on the panel schedule.
5. Observe breakers, wires and terminals for signs of overheating or short circuiting.
6. Verify that all breakers are firmly seated and locked in place by slightly shaking them.
7. Verify that all grounding wires are firmly connected to the grounding bar.
8. If a breaker malfunction is identified, leave breaker in the open position and replace as soon as possible. If a breaker cannot disconnect its circuit, the entire panelboard must be switched off using its main disconnecting means and locked out until the breaker is repaired.
 | Annually | SM | SM | SM |
| Grounding Systems (Section 9-1.6.1) |
| Power Grounding Systems | 1. The connections to the grounding system must be surveyed and verified for continuity. If a connection is suspected to be loose, perform further testing. In some occasions, it is more cost effective to replace the suspected connection instead of performing diagnostic tests.
2. Measure the voltage between the equipment grounding conductor and the electrode grounding conductor (usually bare copper). Investigate test results above 3 VAC for a potential ground fault.
3. Measure the voltage between the chassis of the equipment and the electrode grounding conductor. Investigate if the readings exceed 2 VAC.
 | Annually | SM | SM | SM |
| 1. Facility ground resistance check: This type of testing is performed with a four lead, low resistance ohmmeter or digital ohmmeter. Recommended values are between 3 and 5 ohms. In no case should the grounding resistance be higher than 25 ohms
 | Every five years | SM | SM | SM |
| Grounding Systems (Section 9-1.6.2) |
| Static Grounding Systems | 1. Inspect ground reels for corrosion. Ensure ground reels are securely mounted to a rigid base. Inspect clamps for serviceability. Replace clamp if jaws are deformed for corroded, spring is weak, or other defects are evident that would prevent a good connection. Inspect cable wires. Replace if more than one-third of the cable wires are broken.
 | Quarterly | SM | SM | SM |
| 1. The connections to the grounding system must be surveyed and verified for continuity. If a connection is suspected to be loose, perform further testing. In some occasions it is more cost effective to replace the suspected connection instead of performing diagnostic tests.
 | Annually | SM | SM | SM |
| 1. Resistance measurement on static grounds: Measure static ground resistance of new and damaged ground rods. Static ground with a resistance greater than 10,000 ohms will be removed or replaced. Static ground mechanically damaged will be repaired and retested.
 | When observed to be physically damaged. | SM | SM | SM |
| Electric Motors (Section 9-1.7) |
| Electric Motors | 1. Lubricating motor bearings and inspect for vibration and overheating.
 | Quarterly | SM | SM | SM |
| 1. Check for debris and other foreign material in the fan housing
 | Semi-annually | SM | SM | SM |
| 1. Check motor ground wires. Ensure they are firmly connected to the housing or the junction box.
2. If the motor is installed in a hazardous location, verify that the seals of the connection boxes and conduits are intact.
 | Annually | SM | SM | SM |
| Lighting (Section 9-1.8) |
| Lighting | 1. Verify proper operation of light switch, lighting contactor, photocell or timer as appropriate. If a lighting contactor is used, listen for the chatter of contacts or buzzing noise. These are indicative of a faulty contactor. Replace if required.
2. With the lights turned on, observe individual luminaries for flicker or lights turning on and off. The former is indicative of a faulty choke. The latter is indicative of a faulty starter. Replace the faulty components as required.
3. When light fixtures are located in hazardous areas, verify that the seals are intact and the hazardous rating of the fixture is maintained.
 | Quarterly | SM | SM | SM |
| 1. Thoroughly clean dust, bugs, and debris from the luminaire. Light solvents or cleaning agents may be used.
 | Annually (in dusty areas the luminaries may require cleaning at shorter intervals) | SM | SM | SM |
| 1. Re-Lamping: With the lights turned off, replace the lamps. In order to prevent accidental turning on of the lights, it is mandatory to switch off and lockout the breaker of the lighting circuit. Ensure the replacement lamps are the same type as those they are replacing. Verify the proper operation of all light fixtures after the lamp replacement.
 | Annually or as required | SM | SM | SM |
| Electronic Equipment (9-1.9) |
| Electronic Equipment | 1. Inspect the outside of equipment enclosures for dust and evidence of corrosion. Vacuum clean the dust to ensure unobstructed air circulation.
2. Open the enclosure and vacuum clean the dust to ensure unobstructed air circulation. Pay particular attention to fans and air passages. If there is evidence of corrosion, verify that there is no water damage on printed circuit boards or contacts. If water or humidity damage is observed, the electronic components may not work properly and further testing is required.
3. Verify proper operation of the space heater if one is installed.
4. Check if fans for proper operations and rotation.
5. Look for signs of overheating such as discoloration and charring.
6. Replace air filters.
7. Verify connection tightness. Lightly pull wires on soldered and terminal screws and ensure the wires are not loose.
8. Verify that circuit boards are properly seated. Ensure that board locking tabs are fully engaged. Do not unplug and plug connectors to verify seating. This will wear out the pins. Unplug only if connector malfunction is suspected.
9. Observe wires for excessive strain, braiding, or wear due to vibration. Replace as required.
 | Annually | SM | SM | SM |
| **CATHODIC PROTECTION SYSTEMS** |
| Cathodic Protection (Section 9-2.1) |
| Cathodic Protection | 1. Inspect rectifiers in in accordance with UFC 3-570-06
 | \**2**\ Monthly /**2**/  | \**2**\ OM /**2**/ | \**2**\ OM /**2**/  | SM |
| 1. Inspect cathodic protection systems in accordance with UFC 3-570-06
 | Annually | SM | SM | SM |
| Lightning Surge Arresters (Section 9-2.2.1) |
| Lightning Surge Arresters | 1. Newer lightning surge arresters are designed to withstand unlimited surges at 50,000 amperes; however, manufacturers of older surge arresters may provide a maximum number of surge events that can occur before it must be replaced. If surge arresters include a maximum number of surge events, a spare arrester must be kept on hand. Refer to the surge arrester manufacturer’s operation and maintenance manual for particular inspection instructions and parts. Inspect as part of an overall cathodic protection system inspection.
 | Annually | SM | SM | SM |
| Card and Key Locks (Section 9-3) |
| Card and Key Locks | 1. Conduct operational check of card and key lock system and ensure that all features provided with the installed system are operational.
 | Annually | SM | SM | SM |
| Lightning Protection Systems (Section 9-4) |
| Lightning Protection Systems | 1. Inspect air terminals to make sure they are securely attached to the roof of the building, canopy, or the piece of equipment. Check all connections between the air terminals and the grounding loop or grounding rods. Repair damaged or loose connections and perform continuity check after repairs.
 | Annually | SM | SM | SM |
| Ground Verification System (Section 9-5) |
| Ground Verification System | 1. Conduct an operational check of the ground verification system and ensure that all features provided with the installed system are operational. Inspect the plug for corrosion, weakness, or loose nuts and replace if heavily dented or deformed.
 | Quarterly | SM | SM | SM |
| Electronic Overfill Protection Systems (Section 9-6) |
| Electronic Overfill Protection Systems | 1. Conduct operational check of overfill prevention system and ensure that all features provided with the installed system are operational.
 | Quarterly | SM | SM | SM |
| **ALTERNATE POL FACILITIES** |
| Liquefied Petroleum Tanks (Section 10-1.1) |
| Liquefied Petroleum Tanks | 1. Inspect fuel tank for leaks. If a leak is occurring, the odorizing agent of the gas should be detectable. Use a soap and water solution to spray on areas suspected of leaks. Systems that are found with leaks must be taken out of service.
 | Monthly | OM | OM | OM |
|  | 1. Test operation of emergency shutoff valves. Ensure the fusible link mechanism is attached properly to actuate in case of a fire and that it has not been by-passed, blocked, or damaged in any manner. Ensure the fusible link is not filled with debris or paint which could impact operation.
 | Semi-annually | SM | SM | SM |
|  | 1. Check settings of tank safety valves and calibrate if required
 | Every 5 years | SM | SM | SM |
| Liquefied Petroleum Pipelines (Section 10-1.2) |
| Liquefied Petroleum Pipelines | 1. Conduct visual inspection of pipelines for potential damage and leak points. Use a soap and water solution to spray on areas suspected of leaks. Systems that are found with leaks must be taken out of service and repaired.
 | Monthly | OM | OM | OM |
| 1. Inspect coatings and markings on piping. Repair coating deterioration and replace labels that are fading and are difficult to read.
 | Semi-annually | SM | SM | SM |
| Liquefied Petroleum Vapor Lines (Section 10-1.3) |
| Liquefied Petroleum Vapor Lines | 1. Inspect vapor lines for leaks. If leaks are occurring, the odorizing agent in the gas should be detectable. Use a soap and water solution to spray on areas suspected of leaks. Systems that are found with leaks must be taken out of service and repaired.
 | Monthly | OM | OM | OM |
| 1. Inspect coatings and markings on piping. Repair coating deterioration and replace labels that are fading and are difficult to read.
 | Semi-annually | SM | SM | SM |
| LPG Vaporizers (Section 10-1.4) |
| LPG Vaporizers | 1. Inspect vaporizers for leaks. If leaks are occurring, the odorizing agent in the gas should be detectable. Use a soap and water solution to spray on areas suspected of leaks. Systems that are found with leaks must be taken out of service and repaired.
 | Monthly | OM | OM | OM |
| 1. The manufacturer’s maintenance schedules and recommendations provided with the LPG vaporizer must be followed.
 | As Required | SM | SM | SM |
| Petroleum Gas Regulators (Section 10-1.5) |
| Petroleum Gas Regulators | 1. Inspect petroleum gas regulators for leaks. If leaks are occurring, the odorizing agent in the gas should be detectable. Use a soap and water solution to spray on areas suspected of leaks. Systems that are found with leaks must be taken out of service and repaired.
 | Monthly | OM | OM | OM |
| Liquefied Petroleum Gas Hoses (Section 10-1.6) |
| Liquefied Petroleum Gas Hoses | 1. Inspect hoses for damage and leaks. If leaks are occurring, the odorizing agent in the gas should be detectable. Use a soap and water solution to spray on areas suspected of leaks. If leaks are detected from a hose discontinue use of the hose and remove it from service. Inspect for damage to outer cover that exposes reinforcement. Inspect for kinks or flattened areas, soft spots or bulges. Inspect couplings and ensure they have not slipped on the hose or been damaged.
 | Monthly | OM | OM | OM |
| CNG Piping (Section 10-2.1) |
| CNG Piping | 1. Inspect CNG lines for leaks. Inspection of high-pressure CNG lines and equipment must be conducted using proper PPE including but not limited to safety glasses, a face shield, hard hat and fire resistant clothing. If leaks are occurring, the odorizing agent in the gas should be detectable. Use a soap and water solution to spray on areas suspected of leaks. Systems that are found with leaks must be taken out of service and repaired.
 | Daily | OM | OM | OM |
| 1. Inspect coatings and markings on piping. Repair coating deteriora- tion and replace labels that are fading and becoming difficult to read.
 | Semi-annually | SM | SM | SM |
| CNG Compressors (Section 10-2.2) |
| CNG Compressors | 1. Compressors will require maintenance based on the model included in the system. Consult the compressor manual for maintenance requirements
 | As Required | SM | SM | SM |
| CNG Storage (Section 10-2.3) |
| CNG Storage | 1. Inspect CNG tubes and tanks for leaks. Inspection of high-pressure CNG lines and equipment must be conducted using proper PPE including but not limited to safety glasses, a face shield, hard hat and fire resistant clothing. If leaks are occurring, the odorizing agent in the gas should be detectable. Use a soap and water solution to spray on areas suspected of leaks. Systems that are found with leaks must be taken out of service and repaired.
 | Daily | OM | OM | OM |
|  | 1. Inspect coatings and markings on storage tubes or tanks. Repair coating deterioration and replace labels that are fading and becoming difficult to read.
 | Semi-annually | SM | SM | SM |
|  | 1. Check operation and calibration of safety valves on tubes or tanks.
 | Every 3 years | SM | SM | SM |
| CNG Dispensers (Section 10-2.4) |
| CNG Dispensers | 1. Dispensers are listed for service with CNG and will vary by manu- facturer. Consult the maintenance manual that was supplied with the system for manufacturer’s maintenance required for the CNG dispenser.
 | As Required | SM | SM | SM |
| CNG Dispenser Hoses (Section 10-2.5) |
| CNG Dispenser Hoses | 1. Inspect hoses for damage, leaks, and cracks. If leaks are occurring, the odorizing agent in the gas should be detectable. Use a soap and water solution to spray on areas suspected of leaks. If leaks are detected from a hose, discontinue the use of the hose and remove it from service.
 | Monthly | OM | OM | OM |
| 1. Test hoses for leaks following manufacturer recommended frequencies and procedures.
 | As required | SM | SM | SM |
| Hydrazine Charging Units (Section 10-3) |
| Hydrazine Charging Units | 1. Hydrazine charging units are self-contained factory fabricated systems. Refer to the manufacturer’s maintenance manual that was provided with the system for required periodic maintenance.
 | As Required | SM | SM | SM |
| **SUPPORT FACILITIES** |
| Fuel Truck \**1**\and Rail/**1**/Containment Areas (Section 11-1.1) |
| Fuel Truck Containment Areas | 1. Remove debris from around security fence.
2. Inspect fence grounding points. Ensure connections are not loose or damage.
3. \**2**\ Inspect the parking area for cracks in the concrete containment paving and curbs. Remove vegetation that may have established roots in the buildup of dirt or from exposed earth under cracks. /**2**/
 | Monthly | OM | OM | OM |
| 1. Inspect the parking area for cracks in the concrete containment paving and curbs. Remove vegetation that may have established roots in the buildup of dirt or from exposed earth under cracks. Thoroughly clean and seal cracks with a fuel resistant sealant.
 | Quarterly | SM | SM | SM |
| 1. \**1**\ Secondary containment systems degrade and will collect debris which can clog drainage inlets or prevent drain valves from sealing properly. Hydrostatically test secondary containment and associated drainage systems to include containment concrete/sealant, drain inlets, drain lines and containment drain valves to ensure containment is liquid tight. This test may use opportune rainfall by holding rainwater in the containment system for one hour. Where evaporation is a concern, conduct the testing when this concern would be minimized, such as at night/early morning or during a time of year when this would not be as much of an issue. Record the water level at the start of the 60-minute (minimum) hold period. If the water level drops by 1/8 inch or more, perform and record an investigation to determine the cause and any required repairs. Once repairs are completed, a new test must be completed. Refer Appendix B for testing procedures and to document the testing. /**1**/.
2. Verify continuity of vehicle grounding system connections. If a connection is suspected to be loose, perform further testing. In some occasions it is more cost effective to replace the suspected connection instead of performing diagnostic tests.
3. Inspect pavement markings and vehicle movement lines for wear and fading. Repair faded or worn pavement markings.
4. Inspect security fence for wear and rust. Inspect barbed wire and ensure it is adequately secured to outriggers. Repair loose fencing components and coatings at areas that show rust.
 | \**1**\Every 3 Years/**1**/ | SM | SM | SM |
| 1. /**2**/Refer to [Section 9-1.8 Lighting](#Lighting) for inspection and maintenance requirements of area lighting
 | As required | SM | SM | SM |
| Remote Spill Containment (Section 11-1.2) |
| Remote Spill Containment | 1. Inspect the remote containment basin for cracks in the concrete containment paving, walls, and curbs. Remove vegetation that may have established roots in the buildup of dirt or from exposed earth under cracks. \**2**\ /**2**/
2. If equipped, inspect spill containment sump pump for proper operation.
 | \**2**\Monthly/**2**/ | \**2**\OM/**2**/ | /**2**/OM/**2**/ | \**2**\OM/**2**/ |
| 1. \**2**\ Inspect the remote containment basin for cracks in the concrete containment paving, walls, and curbs. Thoroughly clean cracks with a water spray or air jet. Seal cracks with a fuel-resistant sealant. /**2**/
 | Quarterly | SM | SM | SM |
| 1. \**1**\ Secondary containment systems degrade and will collect debris which can clog drainage inlets or prevent drain valves from sealing properly. Hydrostatically test secondary containment and associated drainage systems to include containment concrete/sealant, drain inlets, drain lines and containment drain valves to ensure containment is liquid tight. This test may use opportune rainfall by holding rainwater in the containment system for one hour. Where evaporation is a concern, conduct the testing when this concern would be minimized, such as at night/early morning or during a time of year when this would not be as much of an issue. Record the water level at the start of the 60-minute (minimum) hold period. If the water level drops by 1/8 inch or more, perform and record an investigation to determine the cause and any required repairs. Once repairs are completed, a new test must be completed. Refer Appendix B for testing. /**1**/.
 | \**1**\Every 3 Years/**1**/ | \**2**\ SM /**2**/ | \**2**\ SM /**2**/ | \**2**\ SM /**2**/ |
| Pumphouse/Filter Buildings (Section 11-2.1) |
| Pumphouse/Filter Buildings | 1. Inspect the floor and containment curbs for cracks. Thoroughly clean cracks with a water spray or air jet. Seal cracks with a fuel resistant sealant.
 | Annually | SM | SM | SM |
| 1. Refer to UFC \**1**\ 3-110-03 /**1**/ for inspection and maintenance requirements of pumphouse and filter building roof systems
 | As required | SM | SM | SM |
| Canopies (Section 11-2.2) |
| Canopies | 1. Inspect and maintain canopies according to UFC \**1**\ 3-110-03 /**1**/**.**
 | As required | SM | SM | SM |
| Emergency Eyewash/Showers (Section 11-3) |
| Emergency Eyewash/ Showers | 1. Test operation of the emergency eyewash/shower by pushing on the activation handles. Ensure water is not brown in color, due to rust in the piping or dirt seeping in from a hole in the buried piping. For systems with tempered water, ensure that water that is being supplied by the emergency eyewash/shower is between 60 and 100 °F (16 and 39 °C). For systems with a horn and strobe light, ensure that the horn and strobe light activate when the activation lever on the emergency eyewash/shower is pushed. For systems that interface with Installation or fire emergency systems, pre-coordinate before testing. At some Installations emergency eyewashes and showers act as EFSOs and are tied into the fire alarm systems.
 | Weekly | \**1**\OM/**1**/ | \**1**\OM/**1**/ | \**1**\OM/**1**/ |
| 1. Inspect portable/packaged safety showers and eyewash stations for proper operation. Check fluid levels. Where tap water is used, fluid must be replaced monthly. Less frequent intervals of fluid change, as recommended by the manufacturer, are acceptable where a solution or water additive is used. Ensure packaged eyewash supplies are within the listed expiration date. Tags or labels must be attached to the unit or adjacent to it, indicating the fluid change schedule.
 | Monthly | \**1**\OM/**1**/ | \**1\**OM/**1**/ | \**1**\OM/**1**/ |
| 1. Inspect the exterior coatings of permanently installed units and repair damaged coatings or rust.
 | Quarterly | SM | SM | SM |
| 1. For systems with tempered water systems inspect components of the water heater for correct operation and temperature control. Ensure that the safety valve on the hot water heater tank is not leaking.
 | Semi-annually | SM | SM | SM |
| 1. Inspect signage and labels on the emergency eyewash/shower. Replace missing labels or signage that has become loose. Signs that are faded must be replaced
 | Annually | SM | SM | SM |
| Ventilation Hoods (Section 11-4.1) |
| Ventilation Hoods | 1. Inspect the operation of the doors. Ensure that they close and open smoothly.
 | Quarterly | SM | SM | SM |
| 1. Inspect the lights inside of the hood to make sure they are operating properly. Replace light bulbs that are no longer working.
 | Semi-annually | SM | SM | SM |
| 1. Verify that all electrical equipment is properly classified in accordance with NFPA 70 *National Electrical Code*.
2. Inspect the ventilation system (ductwork, fans, etc.) for signs of disrepair and air leakage and ensure it is operational and pulling air through the hood. Inspect and assure that the lab hood air measuring device for assuring proper air flow is permanently attached and working properly. The ventilation hood must be inspected and **\1\**approved by a service specific industrial hygienist or bioenvironmental engineer**/1/** in accordance with OSHA, 29 CFR 1910.1450 *Occupational Exposure to Hazardous Chemicals in Laboratories*, and ANSI/AIHA *Laboratory Ventilation Z9.5*.
3. Verify negative pressure is present through the ventilation hood to the exhaust.
 | Annually | SM | SM | SM |
| Oil/Water Separators (Section 11-5) |
| Oil/Water Separators | 1. Inspect the oil/water separator for the buildup of collected petroleum fuel or oil. Remove and properly dispose of accumulated petroleum fuel or oil.
 | Quarterly or as needed based on precipitation events | SM | SM | SM |
| 1. Drain, clean, and inspect the interior of the oil/water separator. Ensure all divider plates and screens are in good working order. Replace or repair damaged components.
 | Annually or more frequently based on local environmental conditions. | SM | SM | SM |
| Cranes and Hoists (Section 11-6) |
| Cranes and Hoists | 1. Inspect cranes and hoists for smooth operation. If the crane or hoist is equipped with electronic controls, check power supply and operational control cords for nicks or damage. A crane service technician must correct binding that may prevent smooth operation and repair damage to power cords.
 | Before each use | OM | OM | OM |
| 1. Apply lubricant or grease to areas that require periodic greasing.
2. Military services-specific, host nation, state, and/or local regulations require cranes and hoists to be certified for operation. Follow the more stringent of military services-specific, host nation, state or local regulations.
 | Annually | SM | SM | SM |
| **FUEL FACILITY TEMPORARY DEACTIVATION OR CLOSURE** |
| Deactivated Fuel Tanks (Section 12-2) |
| Deactivated Fuel Tanks | 1. Inspect water or anti-corrosion level in tank. If level has dropped, investigate potential leak points such as blind flanges. Repair leaks that are detected and refill to appropriate level.
2. Check exterior coatings and labels. Repair peeling coatings and/or rusting areas and replace or repair labels which have become faded and difficult to read.
 | Quarterly | SM | SM | SM |
| 1. Inspect cathodic protection system for proper operation.
 | Annually | SM | SM | SM |
| Deactivated Pipelines (Section 12-3) |
| Deactivated Pipelines | 1. Inspect the pressure of the nitrogen charge applied to the petroleum fuel pipeline with a pressure gauge. If the pressure of the charge has dropped investigate and repair leak points. Once leak points are repaired, recharge with nitrogen.
2. Check exterior coatings and labels. Repair peeling coatings and/or rusting areas and replace or repair labels which have become faded and are difficult to read.
 | Quarterly | SM | SM | SM |
| 1. Inspect cathodic protection system for proper operation.
 | Annually | SM | SM | SM |
| Deactivated Pumps (Section 12-4) |
| Deactivated Pumps | 1. Manually rotate pump through several rotations. Ensure that the pump turns freely.
2. Check exterior coatings. Repair peeling coatings and/or rusting areas and replace or repair labels which have become faded and difficult to read.
 | Quarterly | SM | SM | SM |
| 1. Remove isolation flanges and recoat interior of pump with light corrosion-inhibiting oil.
 | Annually | SM | SM | SM |
| Miscellaneous Deactivated Components (Section 12-5) |
| Miscellaneous Deactivated Components | 1. Ensure that blind flanges are tight. Inspect exterior coatings and labels. Repair peeling coatings and/or rusting areas and replace or repair labels that have become faded and are difficult to read.
 | Annually | SM | SM | SM |

**Note: Follow manufacturer’s recommendation and published operation and maintenance manuals for items and equipment not discussed in this document.**