



Marina Piping Systems

What You Need to Know

Petroleum storage systems at marinas may involve aboveground storage tanks (ASTs) or underground storage tanks (USTs), or both, and typically involve complex piping systems that are unique and typically transition from underground on land to aboveground over the water on piers and docks. In addition, marinas may have both over the water and on land dispensing systems.

General Marina Do's and Don'ts

- **DO** submit a work plan to the Maryland Department of the Environment (MDE) for approval prior to installing or upgrading piping systems associated with piers or docks. See the Marina Piping Work Plans section below.
- **DO** notify MDE in writing a minimum of 60-days before beginning the installation of a new or replacement UST system.
- **DO** register all UST systems with MDE regardless of the capacity or petroleum substance stored.
- **DO** obtain an Individual Oil Operations Permit from MDE if:
 - The marina has an AST system (of any size) that is part of a motor fuel dispensing facility for boats, vessels, and other marine craft used primarily for recreational purposes by the general public; or
 - The marina has an AST system of 1,000 gallons or more that used for used oil storage.
- **DO** obtain a state wetlands permit to construct AST systems within the 100-year flood plain. The construction of ASTs, secondary containment dikes, or walls within the tidal wetlands or within the 100-year flood plain is prohibited unless a State Wetlands Permit is first obtained from the Department.
- **DO** install an appropriate anchoring system for an AST if located in an area subject to flooding or subject to high winds and for a UST if located in a high groundwater area or a mapped flood zone.
- **DO NOT** apply the 40% Rule as defined in Code of Maryland Regulations (COMAR) to the replacement or upgrade of the aboveground portion of marina piping.
- **DO NOT** use galvanized pipe or fittings for kerosene or diesel fuel applications either underground or aboveground. PEI/RP100 and PEI/RP1000.
- **DO** install or upgrade underground piping associated with an AST system in a UL listed or MDE approved secondary containment system that is connected in a liquid tight containment sump.



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- **DO** install an anti-siphon valve or normally closed solenoid valve adjacent to and downstream of the block ball valve at the tank outlet if any portion of the above or below grade piping is at a lower elevation than the product in the tank at any point.
- **DO** install a line leak detector for pressurized piping. If an anti-siphon valve is installed at the tank, the line leak detector must be installed immediately downstream of the anti-siphon valve. The line leak detector must be certified to function with the type of fuel stored and material, length, and diameter of the underground piping. The line leak detector must monitor the underground portion of the piping. For mechanical line leak detectors, install a time delay on a normally closed solenoid valve installed in the onshore transition sump. If an electronic line leak detector is installed, electrically wire the normally closed solenoid valve in the onshore transition sump so that the valve will be closed during the line leak detector test period.
- **DO** install double walled piping, continuously monitored containment sumps, a pressure regulating valve at the pump, and an anti-siphon valve at the tank if a suction pump is used to dispense product and located at a lower elevation than the product in the tank at any point.
- **DO** install continuously monitored containment sumps, maintain a uniform pipe slope of a minimum of 1/8 inch rise for each lateral foot from the tank top to the end of the piping run for as much of the piping as feasible, and minimize the number of times the direction of the piping slope changes.
- **DO** install a fully ported ball valve and safety break valve in accordance with manufacturer's specifications at a stable point just onshore of where the piping transitions to over the water. Install the valves in a continuously monitored containment sump if the valves are below ground or not visible. The piping must be straight and in line with the safety break in the sump so that any tensional stress placed on the piping will produce a force parallel to the long axis of the safety break.
- **DO** install piping to provide flexibility to accommodate small-scale movement due to wave action and movement of people on the dock or pier and larger-scale movement due to seasonal water level variations or periodic tidal changes.
- **DO** install for each pipeline a readily accessible and labeled shut-off valve located on shore, near the approach to the wharf, pier, or dock and outside any diked area. Access to the shut-off valve should not require any special tools or a lid that is bolted closed.
- **DO** install valves and fittings to permit draining of marina piping for marinas in colder climates, with a seasonal operation or extended idle periods, or in an area subject to hurricanes or imminent severe weather.
- **DO** install dispensers and dispenser nozzle receptacles that turn off power to the pump when the dispensing nozzle is replaced, hung up, or stowed.
- **DO NOT** use hold open devices on dispenser nozzles serving marine craft.



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- **DO** install a means to secure the dispensing hose using a hose reel (or other approved method) to protect it from damage when the length exceeds 18 feet. A breakaway device is not required on a dispensing hose of a dispenser that only serves marine craft.
- **DO** install a securely anchored double poppet emergency shutoff valve (shear valve) in accordance with manufacture instructions at the base of any dispenser connected to a pressurized piping system.
- **DO** install containment sumps beneath dispensers located on a pier, dock, wharf, or bulkhead.
- **DO** install clearly identified emergency electrical disconnects on each marine wharf that are readily accessible in case of fire or physical damage at any dispensing unit. The disconnects shall be interlocked to shut off power to all pump motors, fuel dispensing devices, solenoid valves, and electrical circuits in classified areas from any individual location and shall be manually reset only from a master switch. Locate emergency electrical disconnects no closer than 20 feet and no further than 100 feet from each dispensing device and on land within 10 feet of the bulkhead and near the fueling pier. Identify each disconnect by an approved sign stating **EMERGENCY PUMP SHUTOFF** in two-inch red capital letters.
- **DO** have an attendant present during all vessel fueling activities. The attendant shall: be familiar with the dispensing system and emergency shutoff controls; prevent the dispensing of oil into improper portable containers; ensure vessels are properly moored and all fueling connections are made; be within 15-feet of the dispensing controls during a fueling operation; and maintain a direct, clear, and unobstructed view of both the vessel fuel filler and the emergency pump shutoff.
- **DO** provide a spill response box near a fuel dispenser area that is inspected monthly to ensure supplies of sorbent materials are maintained.
- **DO** perform monthly and annual walkthrough inspections completing the MDE Walkthrough Inspection forms, or forms approved by MDE. MDE forms are available on the MDE website at: <https://mde.maryland.gov/programs/land/OilControl/Pages/factsheetspublications.aspx>

Compliance Testing

The following scenarios are unique to marina UST systems. For specific questions or for additional clarification, please contact the Oil Control Program at 410-537-3442.

- Aboveground containment sumps on a dock or pier must be tested in accordance with Maryland Containment System Testing Protocol or MDE approved test method upon installation and maintained liquid tight but routine testing is not required.
- For pressurized piping, the line leak detector is only required to cover the underground portion of the product piping. When an electronic solenoid valve that isolates the underground piping is



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installed in the bulkhead transition sump, the tester can perform a line leak detector 3.0 gallon per hour (gph) operability test for the section of piping between the tank top and solenoid valve. If no solenoid valve is installed, the line leak detector must monitor the entire piping system, underground and aboveground, and the line leak detector 3.0 gph operability test must be from the furthest dispenser.

- An initial precision tightness test following a new piping install/upgrade must include the entire piping system, underground and aboveground.
- With the exception of the initial precision tightness test, the aboveground portion of marina product piping is not required to be precision tightness tested if an electronic solenoid valve is properly installed in an appropriate location. When an electronic solenoid valve that isolates the underground piping is installed, the tester can perform a precision tightness test of the piping between the tank top and solenoid valve. If no solenoid valve is installed, the precision tightness test must include the entire piping system, underground and aboveground.
- The interstice of underground double walled pipe must be tested in accordance with the piping manufacturer's testing protocol at the time of installation and every 5 years thereafter.
- Double-walled storage system (tank and/or piping) installed on or after Jan 12, 2009 must use interstitial monitoring for a method of monthly release detection.

Marina Piping Work Plans

At least 60 days prior to the start of installation of a UST or AST system, submit to MDE for review and approval the storage tank system engineering plans prepared by one or more of the following individuals: Professional engineer; MD Certified UST System Technician, MD Certified UST System Inspector; and/or authorized inspector as defined in COMAR 26.10.18.02B. The plan submitted for approval must include but is not limited to the following:

- Detailed description of all proposed upgrades and installation of piping system activities
- Name and contact information for the Maryland certified UST system technician overseeing the installation/upgrade
- Make, model, and material of construction of proposed USTs and ASTs and all USTs or ASTs to remain in service to include whether the tanks are single or double walled
- Length, diameter, make, model, and material of construction of the proposed product piping and all existing piping to remain in service to include whether the piping is single or double walled. Include distances between system components such as the distance between containment sumps (i.e., tank top to bulkhead sump and from bulkhead sump to each dispenser sump)
- Location of all piping transitions



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- Location of all containment sumps
- Location of all containment sump sensors and identifying those programmed for positive shut down of pumps and dispensing operations
- Location of all shut-off valves, safety breaks, solenoid valves, pressure relief valves, anti-siphon valves, suction pumps, submersible turbine pumps, and emergency-stop controls or disconnects
- Verification that the slope of the underground piping rises a minimum of 1/8 inch for each lateral foot from the tank top to the end of the piping run
- Location of all piping slope changes
- Make and model of all line leak detectors and verification from the manufacturer or certification from a third party as to its applicability to the marina storage system, where the verification / certification must indicate the line leak detector will function with the type of fuel stored and material, length, and diameter of the piping and include the maximum length and volume of pipe for which the line leak detector is rated
- Location of all fixed and floating piers, docks, and wharfs
- Anticipated range of motion of the dock, pier, and piping due to wave action, movement of people on the dock or pier, seasonal water level variations, and periodic tidal changes
- Location of all continually or periodically submerged piping
- Type of piping supporting and securing hardware
- Detailed plan for draining, disconnecting and/or storing the piping for the off season (as applicable)
- Location of all dispensers
- Location of each hose reel
- Site sketch
- Other pertinent system components

Marina Fueling System Requirements

All new oil storage tank systems shall comply at the time of installation and an owner, an operator, and a person in charge of an existing oil storage tank system installed before June 13, 2022 and used for fueling vessels at a marina shall ensure their marina fueling system satisfies all the following requirements no later than June 13, 2025:

- Pier or docks must have the following:



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- Each pipeline is equipped with:
 - A liquid tight and weatherproof containment sump on shore, near the approach to the wharf, pier, or dock and outside any diked area;
 - A readily accessible and labeled manual shut-off ball valve grouped in one location located inside the weatherproof containment sump. Access to the shut-off ball valve should not require any special tools or a lid that is bolted closed;
 - An in-line breakaway that seals both ends of the piping;
 - Solenoid valve that is closed when emergency pump shutoff is activated or when no fueling is occurring;
 - Fire rated flex connectors; and
 - A reducing seal in the end of the access/chase pipe (if needed to prevent water entry).
- Floating pier must have a liquid tight containment sump located on the floating pier that contains the following components:
 - An in-line breakaway that seals both ends of the piping;
 - Manual ball valve in each product line; and
 - Sump sensor that triggers a positive system shutdown.

Note: Single plane swivel joints with flanged fittings is not applicable for marina application.

- All underground product piping for AST systems must be UL listed double-walled construction and terminate inside of liquid tight containment sumps.
 - If new UL Listed double walled flexible plastic product piping is installed underground between an AST and bulkhead, that same product piping can be extended aboveground under the marina pier to the dispensers if it is approved by the piping manufacturer for aboveground, over water, and/or underwater use in a marina application. Or, if not rated for aboveground, overwater, and/or underwater use, the piping must be sleeved in ridged, corrosion-resistant pipe that meets a minimum 2-hour fire rating.
 - Be rated to withstand a corrosive environment, resistant to ultraviolet radiation and fire, and protected against physical damage.
 - Be installed to prevent chafing, pinching, kinking, and crushing.
 - Be installed to prevent releases due to structural failure, stress, corrosion, ultraviolet radiation, heat, cold, movement, etc.
 - Provide for flexibility for the anticipated range of motion of the dock, pier, and piping due to waves, movement of people on the dock or pier, etc.
 - Be properly supported at least every 10 feet or in accordance with the manufacturer's specifications.
 - Be spaced a distance greater than or equal to the diameter of the pipe or pipe sleeve.



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- Be accessible for inspection and maintenance.
- Each dispenser has a liquid tight containment sump.
- Clearly identified emergency electrical disconnects must be present on each marine wharf that are readily accessible in case of fire or physical damage at any dispensing unit. The disconnects shall be interlocked to shut off power to all pump motors, fuel dispensing devices, solenoid valves, and electrical circuits in classified areas from any individual location and shall be manually reset only from a master switch. Locate emergency electrical disconnects no closer than 20 feet and no further than 100 feet from each dispensing device and on land within 10 feet of the bulkhead and near the fueling pier. Identify each disconnect by an approved sign stating **EMERGENCY PUMP SHUTOFF** in two-inch red capital letters.
- One or more signs must be posted in the dispensing area that provide instructions to the public on vessel fueling procedures in accordance with Section 11.10.8 of NFPA 30A “Code for Motor Fuel Dispensing Facilities and Repair Garages”

Additional References

Ensure the design and construction of a marina fueling system, including the piping system installed on a pier and connected to a dispenser, complies with the following standards, which are incorporated by reference into COMAR 26.10:

- *Petroleum Equipment Institute Recommended Practice PEI/RP 1000-14 Recommended Practices for the Installation of Marina Fueling Systems*
- *PEI/RP100-17 Recommended Practices for Installation of Underground Liquid Storage Systems*
- *National Fire Protection Association NFPA 30, 2021 Edition, Flammable and Combustible Liquids Code*
- *NFPA 30A, 2021 Edition, Code for Motor Fuel Dispensing Facilities and Repair Garages*
- *NFPA 70, 2020 Edition, National Electrical Code*

Contacts

For further information on marina AST and UST systems, please contact the MDE Oil Control Program at (410) 537-3442 or (800) 633-6101 ext. 3442.

To report UST system precision test failures, actual or suspected spills, releases, or discharges of regulated substances contact MDE during normal business hours at 410-537-3442 or after hours at 866-633-4686.



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Limitations

The storage of petroleum products and the installation, maintenance, and inspection of storage systems is a hazardous endeavor. Only experienced and certified storage tank personnel should perform the actions as outlined in this fact sheet.

This fact sheet has been provided for informational purposes. This document is not intended, nor should it be interpreted to be a regulation, as defined in Section 10-101, State Government Article. The MDE encourages you to read and understand the regulations that govern the operation of UST systems and AST systems found in COMAR 26.10. – Oil Pollution Control and Storage Tank Management.