
State Water Resources Control Board

February 5, 2021

LOCAL GUIDANCE 150-3 UNDERGROUND STORAGE TANK OVERFILL PREVENTION EQUIPMENT

To: Unified Program Agencies and Other Interested Parties

The purpose of this local guidance (LG) letter is to clarify the overfill prevention equipment (OPE) requirements for underground storage tanks (USTs), their relation to secondary containment requirements, and when USTs may be exempt from OPE requirements. This letter also will provide guidance on the OPE inspection criteria, documentation, and recordkeeping.

Overfill Prevention Equipment Requirements

Installation of OPE is required pursuant to Health and Safety Code, division 20, chapter 6.7, sections 25290.1(f), 25290.2(e), 25291(c), and 25292(d) and California Code of Regulations, title 23, division 3, chapter 16 (UST Regulations), sections 2631(l), 2635(c) and (d), and 2665. OPE is not permitted to allow manual override and must be compatible with the substance stored in the UST. UST owners or operators must use at least one of the four OPE Performance Measures listed below.

OPE Performance Measures

1. Alert the transfer operator when the tank is 90 percent full by:
 - a. restricting the flow into the tank; **or**
 - b. triggering audible and visual alarms;
2. Restrict delivery of flow to the tank at least 30 minutes before the tank overfills, provided the restriction occurs when the tank is filled to no more than 95 percent of capacity; and activate an audible alarm at least five minutes before the tank overfills;
3. Provide positive shut-off of flow to the tank when the tank is filled to no more than 95 percent of capacity; or
4. Provide positive shut-off of flow to the tank so that none of the fittings located on the top of the tank are exposed to product due to overfilling.

Effective October 1, 2018, UST owners or operators may not install, repair, or replace a flow restrictor on vent piping to comply with OPE Performance Measures 1(a) or 2.

[References cited: UST Regulations, §§ 2631(l), 2635(c) & (d), & 2665.]

E. JOAQUIN ESQUIVEL, CHAIR | EILEEN SOBECK, EXECUTIVE DIRECTOR

Overfill Prevention Exemption

The Unified Program Agency (UPA) may waive the requirement for OPE for those USTs where **all** of the following conditions exist:

- The tank inlet exists in an observable area;
- The spill container is adequate to collect any overfill;
- The tank system is filled by transfers of no more than 25 gallons at one time;
- The secondary containment piping exemption described below is not being used.

UPAs cannot waive the OPE requirement for any UST where the secondary containment piping exemption described below is being used.

[References cited: UST Regulations, §§ 2635(c)(2) & 2636(a).]

Pipe Secondary Containment Exemption

The State Water Resources Control Board recommends secondary containment for all pipe. UST construction requirements have developed over decades creating variations in the OPE methods allowed based on the UST installation date and secondary containment of vent and tank riser piping. Permissible OPE Performance Measures are based on the UST installation date:

- USTs installed **on or before June 30, 1987** may utilize any of the OPE Performance Measures regardless of piping secondary containment.
- Vent and tank riser piping in USTs installed **between July 1, 1987 and June 30, 2003** that are equipped with OPE Performance Measures 2 or 3 are exempt from the secondary containment requirement. However, USTs systems installed during that time period without secondary containment on vent or tank riser piping only may use OPE Performance Measures 2 or 3.
 - UPA inspectors must confirm that the vent and tank riser piping are monitored in accordance with UST Regulations, section 2636 and have passed secondary containment testing within the past 36 months in accordance with UST Regulations, section 2637 if the UST is using OPE Performance Measures 1 or 4.
- USTs installed **on or after July 1, 2003** require all pipe to be secondarily contained and therefor may utilize any of the OPE Performance Measures.

[References cited: UST Regulations, §§ 2635(d), 2636(a), & 2665(c).]

Overfill Prevention Equipment Compatibility

UST owners or operators must demonstrate OPE compatibility at least 30 days prior to storage of the hazardous substance. To demonstrate compatibility, the UST owner or operator must submit one of the following:

- A written approval from an independent testing organization, in accordance with industry codes, voluntary consensus standards, or engineering standards, for use with the hazardous substance to be stored;
- A written approval from a state registered professional engineer for use with the hazardous substance to be stored; **or**
- A written affirmative statement of compatibility from the manufacturer of the OPE for use with the hazardous substance to be stored.

[References cited: UST Regulations, § 2631(l).]

Overfill Prevention Methods Discussion

Overfill Alarms

Overfill alarms required in OPE Performance Measures 1 and 2, are most often associated with automatic tank gauge (ATG) systems programmed to activate audible and visual alarms at a prescribed liquid level. Alarms may be used for any delivery type and are not affected by the action of other OPE that may be installed in the UST system. Overfill alarms must be clearly visible and audible to the transfer operator at the tank fill point. Unlike other OPE methods, alarms do not restrict or stop the flow of product to the UST. Functionality of audible and visual alarms and the transfer operator's awareness of the alarms are the only factors preventing an overfill of the UST.

For many commonly used ATG systems, when an overfill alarm is activated for one UST, additional overfill alarms for other tanks will not activate if the alarm for the first tank has not yet cleared. This effectively eliminates overfill protection for all but one tank if multiple tanks are filled at the same time. This condition must be reviewed by the service technician during installation, repair, and every 36-month overfill equipment inspections. Systems that only can activate external alarms when the first UST overfill condition occurs must be noted as failing the inspection and additional actions must be taken to ensure each UST has a functional overfill prevention independent of the other USTs at the facility (i.e., installing a separate alarm unit or other appropriate OPE equipment for each tank).

Positive Shut Off

Positive shut off devices, as used in OPE Performance Measures 3 and 4, mechanically interrupt the flow of product entering the tank. The most common type is a mechanical overfill prevention valve (commonly called a "flapper" or "flapper valve"). Flappers are

installed within the drop tube and have a float mechanism that shuts off the flow of liquid into the tank when the liquid level in the tank reaches the device's activation set point. Some flappers are two-stage devices that first restrict flow to provide a warning to the transfer operator and then provide positive shut-off if filling of the tank continues. Additional examples of positive shut off devices include actuated valves in the fill line activated by the ATG when the liquid level in the tank reaches a programmed level.

Many flapper floats operate by a swing motion that can be adversely affected by other equipment installed in the system. Therefore, reviewing the proximity of the flapper to other in-tank equipment such as the ATG probe, turbine, flow restrictors, or in-tank piping must be included as part of the OPE inspection. Additionally, most flappers have a manufacturer-specified minimum flow rate necessary for the device to properly activate. If flow restrictors are used in the same UST with a flapper, the flow restrictor cannot activate before the flapper does, since the restriction of product into the UST will reduce the flow rate and may prevent the flapper from operating properly.

Minimum flow requirements also must be considered when the substance stored in the UST is a slow-filling viscous fluid (e.g., waste oil). If a flapper is being used with a slow-filling product or waste, the flow rate must be checked and confirmed as meeting the manufacturer's specified minimum prior to installation and during the 36-month inspection.

When a flapper is used, it is the responsibility of the UST owner or operator to ensure that the activation level does not allow any tank top fittings to be exposed when the shut-off level is reached. UST tank tilt and tank curvature must be accounted for prior to utilizing OPE Performance Measure 4.

Flow Restriction

Flow restrictors, commonly known as ball floats, often are utilized to meet performance methods 1(a) and 2. The flow restrictor operates by blocking the flow of vapor from the tank during the filling process. The trapped vapor creates back pressure which resists the inflow of liquid into the UST through the fill pipe. If installed prior to October 1, 2018, flow restrictors must be installed on all UST venting locations, such as riser pipes for UST vents and stage 1 vapor recovery, and in tank manifold piping.

Effective October 1, 2018, flow restrictors are prohibited from being installed to repair or replace OPE equipment. Although systems with existing flow restrictors installed before October 1, 2018 may continue to use the flow restrictors as OPE, such devices should never be used in UST systems that:

- Have suction piping systems with pump(s) equipped with air eliminators;
- Are filled by pressurized fuel delivery; or
- Have a positive shut off valve set to activate at a level above the activation level for a flow restrictor.

When permanently removing a flow restrictor, service technicians must ensure that the entire device (i.e., float, cage, and riser pipe) is removed so as to not interfere with other overfill methods or allow the stored hazardous substance to enter the vent pipe.

Overfill Prevention Equipment Inspection Requirements

Inspection Frequency

Periodic OPE inspections must occur at least once every 36 months after the initial inspection is required to be completed. For USTs installed on and after October 1, 2018, the initial inspection must be completed at the time of installation. For USTs installed before October 1, 2018, the initial inspection was required to have been completed by October 13, 2018. If an inspection is done late, the next periodic inspection is due within 36 months of when the previous inspection was originally due. In addition to the periodic inspections, an inspection is required within 30 days of completion of a repair to the OPE to ensure that it is functional. Repairs are required any time the OPE ceases to operate properly and causes the UST to be out of compliance with UST requirements.

UST owners or operators are required to identify on the UST – Tank Information page in the California Environmental Reporting System (CERS) all OPE associated with the overfill prevention method being used to satisfy the requirements for overfill prevention. All of the identified equipment must be inspected and maintained operational. UST owners or operators may choose to install additional OPE. The inspection requirements do not apply to this additional optional OPE. Optional equipment shall not be identified in CERS as OPE.

[References cited: UST Regulations, §§ 2620(e), 2611, def. “Repair”, 2637.2(a) & 2711(a)(6).]

Inspection Methods

Manufacturer guidelines must be used for the inspection if the guidelines meet the inspection criteria defined below. If manufacturer guidelines do not exist or the manufacturer guidelines do not meet the inspection criteria, an industry code or engineering standard, such as *Petroleum Equipment Institute’s Recommended Practice (RP) 1200* must be used. In the event that there are no manufacturer guidelines, industry codes, or engineering standards, or they do not meet the inspection criteria, then you must use a method developed by a California registered professional engineer.

The inspection procedure used will determine the required inspection activities, such as removing the drop tube from the tank or flow restrictors from the vent piping. At a minimum, the inspection criteria for OPE must determine: 1) if the equipment is set at the correct level in the tank; and 2) if the equipment will activate when the substance stored reaches that level.

A passing result is when the OPE inspected is set at the correct activation level and the equipment is in a condition such that it will activate when the stored substance reaches that level. If the OPE fails the inspection, the UST service technician must provide in the inspection report an explanation for why the equipment failed.

[Reference cited: UST Regulations, § 2637.2(b).]

Inspection Personnel

The inspection must be performed by a qualified UST service technician possessing training or certification provided by: 1) the manufacturer of the OPE being inspected; 2) the developer of the industry code or engineered standard used to inspect the equipment; or 3) the engineer that developed the inspection method used to inspect the equipment. If the manufacturer of the OPE or the developer of the inspection procedure used does not provide training or certification, then the UST service technician must have comparable training and certification. Comparable training or certification is training or certification in an inspection procedure applicable to the device or system as approved by the UPA.

[References cited: UST Regulations, §§ 2637.2(c) & 2715(f)(2)(D) & (E).]

Inspection Documentation

The results of the inspection must be recorded on the current version of the *Overfill Prevention Equipment Inspection Report Form*. All information used to determine if the OPE “passed” or “failed” the inspection must be attached to the form (e.g., the tank calibration chart(s), manufacturer’s installation/inspection checklists or work sheets, measurements, calculations, etc.). The completed *Overfill Prevention Equipment Inspection Report Form* and all required attachments must be submitted to the UPA within 30 days of the date of the inspection by hand-delivery, mail, facsimile, or other electronic methods. The UST owner or operator must retain a copy of the inspection report on-site, or off-site at a readily available accessible location, if approved by the UPA.

[References cited: UST Regulations, §§ 2637.2(d) & (e) & 2712(b)(1)(G).]

Inspection Notification Requirements

UST owners or operators must notify their UPA at least 48 hours prior to conducting the inspection. The notification provides an opportunity to the UPA to incorporate the inspection into its schedule so that the UPA inspector can witness the inspection. The UPA inspector, however, is not required to be present for the inspection to occur.

[Reference cited: UST Regulations, §§ 2637.2(f).]

California Air Resources Board (CARB) and Local Air Districts

OPE and spill containment impact the performance of vapor recovery systems in UST systems storing gasoline. These components may be subject to certification or other requirements implemented and enforced by CARB and local air districts. Installation, removal, and maintenance of these components may require prior approval from the local Air Quality Management District, so removal of these components more frequently than every 36 months (e.g., during every-12-month monitoring system certification testing) is not recommended unless the manufacturer's instructions or site-specific conditions indicate that more frequent inspections are necessary. For more information regarding these requirements, please refer to CARB's website:

<http://www.arb.ca.gov/vapor/vapor.htm>.

If you have questions regarding OPE requirements, please contact UST Leak Prevention Staff at <https://www.waterboards.ca.gov/ust/contacts/contact.html>

Sincerely,



Laura S. Fisher
UST Leak Prevention Unit and
Office of Tank Tester Licensing Manager

Enclosure (1)

1. Appendix 1: Summary of Underground Storage Tank Overfill Prevention Methods

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				Vent and Riser Piping Subject to Secondary Containment and Monitoring		
Overfill Prevention Methods	Maximum Product Level	Overfill Prevention Equipment	Citation	UST Installed before 7/01/87	UST Installed between 7/01/87 and 6/30/2003	UST installed after 7/01/2003
<i>Restrict the Flow into the Tank</i>	90 percent	Flow Restrictor	§2635(c)(1)(A)	NO	YES	YES
<i>Audible & Visual Alarm</i>	90 percent	Liquid Level Device	§2635(c)(1)(A)	NO	YES	YES
<i>Restrict the Flow into the Tank & Audible Alarm</i> <i>(must use both)</i>	Restrict at least 30 minutes before tank overfills & filled to no more than 95 percent of tank capacity	Flow Restrictor	§2635(c)(1)(B)	NO	NO	YES
	Alarm at least five minutes before the tank overfills	Liquid Level Device				
<i>Shut-off the Flow into the Tank</i>	95 percent	Positive Shut-off Device	§2635(c)(1)(C)	NO	NO	YES
<i>Shut-off the Flow into the Tank</i>	Below tank top fittings	Positive Shut-off Device	§2635(c)(1)(D)	NO	YES	YES

Flow restrictors cannot be installed, repaired, or replaced as OPE equipment on or after October 1, 2018.