

A GENERAL OVERVIEW OF UNDERGROUND STORAGE TANK CONSTRUCTION, MONITORING AND TESTING REQUIREMENTS

The attached tables outline underground storage tank (UST*) system requirements in general terms and are not meant to detail all requirements. References to the Health and Safety Code, California Code of Regulations and Local Guidance (LG) letters throughout this overview are intended to be useful but are not necessarily exhaustive of all legal references that might apply or be relevant to a specific requirement. Statutes, regulations, and guidance documents are subject to change, so the references contained herein are current as of the revision date. For more specific information or details on UST system components, monitoring and testing options, etc., refer to the relevant statutes and regulations (Health and Safety Code, division 20, chapter 6.7 (H&SC) and California Code of Regulations, title 23, division 3, chapter 16 (CCR)).

Acronyms

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|---|--|
| <i>ATG: Automatic Tank Gauge</i> | <i>MVF: Motor Vehicle Fuel</i> |
| <i>CITLD: Continuous In-Tank Leak Detection</i> | <i>O/O: Owner/Operator</i> |
| <i>DW: Double-Walled</i> | <i>OPE: Overfill Prevention Equipment</i> |
| <i>FRP: Fiberglass-Reinforced Plastic</i> | <i>SIR: Statistical Inventory Reconciliation</i> |
| <i>GPH: Gallons per Hour</i> | <i>SW: Single-Walled</i> |
| <i>GW: Groundwater</i> | <i>UDC: Under-Dispenser Containment</i> |
| <i>HAZ: Hazardous Substance Tank</i> | <i>UPA: Unified Program Agency</i> |
| <i>LLD: Line Leak Detector</i> | <i>VPH: Vacuum, Pressure, Hydrostatic</i> |

*UST is defined in CCR as tanks and connected piping.

General Construction Requirements for All USTs

| Corrosion Protection | Spill Containment | Overfill Prevention Equipment | Under Dispenser Containment |
|--|--|---|--|
| <p>All USTs shall be resistant to corrosion or have corrosion protection.</p> <p style="text-align: center;">OR</p> <p>Components must be isolated from the backfill, including turbines, risers, and spill containment.</p> <p><i>CCR §2635(a), 2636(b), & 2662(c)</i></p> | <p>Required on all USTs:</p> <ol style="list-style-type: none"> 1. Minimum 5-gallon capacity; 2. Resistant to galvanic corrosion; 3. Method to remove liquid from the spill containment; and <p><i>HSC §25284.1 & 25284.2; CCR §2635(b); LG 166</i></p> | <p>Required on all USTs, and OPE cannot have manual override.</p> <p>OPE Performance Measures:</p> <ol style="list-style-type: none"> 1. Device activates at 90%, restricts flow or triggers an audible and visual alarm (e.g., ATG <u>or</u> ball float.);¹ 2. Device that restricts flow 30 minutes before overflow provided at no more than 95% capacity and activates an alarm 5 minutes before overflow (e.g., ATG <u>and</u> ball float.);¹ 3. Device activates at 95%, positive shut-off of flow to UST (e.g., drop tube flapper valves.); or 4. Device provides positive shut-off before UST fittings are exposed to product. <p>The UPA may waive the OPE requirement if all of the below conditions are met:</p> <ol style="list-style-type: none"> 1. Vent and riser pipe are DW; 2. Inlet exists in an observable area; 3. Spill containment adequate to collect any overflow; and 4. UST filled by no more than 25 gallons per event. <p><i>HSC §25290.1(f), 25290.2(e), 25291(c), & 25292(d); CCR §2635(c) & (d), 2636(a), & 2665; LG 150</i></p> | <p><i>UST Installed before July 1, 2003</i></p> <p>Required for all systems with dispensers.</p> <p><i>CCR §2636(g)</i></p> <p><i>UST Installed on or after July 1, 2003</i></p> <p>Constructed, operated, and maintained product tight.</p> <p>Product tight includes both liquid and vapor.</p> <p><i>HSC §25290.1 & 25290.2</i></p> |

¹ Flow restrictors on vent piping which require repair or replacement shall be retrofitted with equipment in accordance with *CCR §2635(c) and (d)*. New installations may install flow restrictors; however flow restrictors cannot be used as an overfill prevention method.

Tank Construction and Monitoring Requirements

| Date of UST Installation | Tank Construction Type | Tank Monitoring Options | Compatibility |
|--|--|--|---|
| <u>MVF</u> On or before January 1, 1984 | SW FRP or steel with FRP jacket; <p style="text-align: center;">OR</p> 1) SW steel w/ lining or bladder; and 2) corrosion protection. <i>CCR §2662</i> | One of the following options required for SW USTs: 1. SIR at least once every 30 days and tank integrity testing at least once every 24 months; 2. ATG 0.2 gph at least once every 30 days; 3. CITLD 0.2 gph at least once every 30 days; 4. GW Monitoring at least once every 30 days; or 5. Continuous Vadose Zone Monitoring. <i>CCR §2643(b), 2644, 2647, & 2648</i> | All UST systems must be compatible with substance stored. After October 1, 2018, 30 days before storing or changing the hazardous substance, O/O must demonstrate compatibility with all components of the UST system by submitting written approval from an independent testing organization and/or statement of compatibility from the component manufacturer. <i>CCR §2631(j) & (l), 2631.1, & 2640.1</i> |
| <u>HAZ</u> On or before January 1, 1984 | DW construction is required for all hazardous substance USTs. SW HAZ USTs required upgrade to DW systems by December 22, 1998. <i>CCR §2662(b)</i> | Continuous Interstitial Monitoring w/ audible and visual alarm. <i>HSC §25292(a)</i> | |
| After January 1, 1984 and before July 1, 2003 | Primary containment product tight. Secondary containment required. <i>HSC §25291; CCR §2631</i> | Continuous Interstitial Monitoring w/ audible and visual alarm. <i>HSC §25291(b)</i> | |
| On or after July 1, 2003 ² | Primary and secondary containment product tight. <i>HSC §25290.2(a)</i> | Continuous Interstitial Monitoring w/ audible and visual alarm. USTs installed on or after July 1, 2004, the interstitial space must be monitored by VPH and connected to audible and visual alarm. <i>HSC §25290.1(d), 25290.1(e), & 25290.2(d); LG 162</i> | |

² Primary and secondary containment on tanks installed on or after July 1, 2003 must be impervious to liquid and vapor phases of contained product.

Piping Construction Requirements

| Date of UST Installation | Product Piping | Vent, Vapor, and Riser Pipe | Compatibility |
|--|--|---|---|
| <p><u>MVF</u> Before July 1, 1987</p> | <p>DW construction with sump; OR SW FRP; OR SW steel w/ corrosion protection. <u>Note: SW buried pipe must meet the requirements of CCR, title 23, article 3, when repaired or replaced.</u> <i>HSC §25292(b) & 25291(a)(7); CCR §2636(a) & 2666(b)(2)</i></p> | <p>No sump requirement for SW construction.</p> | <p>All UST systems must be compatible with substance stored. After October 1, 2018, 30 days before storing or changing the hazardous substance, O/O must demonstrate compatibility with all components of the UST system by submitting written approval from an independent testing organization and/or statement of compatibility from the component manufacturer.</p> |
| <p>On or after July 1, 1987 through July 1, 2003</p> | <p>DW construction with turbine sump, unless connected to a suction dispensing system that meets safe suction requirements. <i>HSC §25291(a); CCR §2636(a)(3)</i></p> | <p>DW construction with sump if designed to contain liquid-phase product; OR SW dependent on OPE. <i>CCR §2636(a); LG 150</i></p> | <p><i>CCR §2631(j) & (l), 2631.1, & 2640.1</i></p> |
| <p>On or after July 1, 2003</p> | <p>Secondary containment required. Liquid and vapor tight. <i>HSC §25290.1(a) & (c) & 25290.2(a) & (c)</i></p> | <p>Secondary containment required for buried pipe. Meets the definition of piping. Liquid and vapor tight. <i>HSC §25290.1(a) & (c) & 25290.2(a) & (c)</i></p> | |

Monitoring Requirements for Single-Walled Piping Types

| Pressurized | Suction (Conventional) | Safe Suction | Gravity |
|--|---|---|--|
| <p>Must be equipped with an electronic LLD capable of detecting a 3.0 gph leak. The LLD shall be capable of shutting off the pump when a release occurs and shall shut down the pumping system automatically if the LLD fails or is disconnected. LLDs on <u>Emergency Generator</u> systems may have an audible and visual alarm in lieu of shutting down the pumping system.</p> <p style="text-align: center;">AND EITHER</p> <p>1. Pass a 0.2 gph line test at least once every 30 days; or</p> <p>2. Pass a 0.1 gph line tightness test at least once every 12 months</p> <p><i>CCR §2643(c) & 2666(b)(2)</i></p> | <p>0.1 gph line tightness test every 36 months;</p> <p style="text-align: center;">AND</p> <p>Daily visual monitoring for presence of air in system. <i>(Inspection log required.)</i></p> <p><i>CCR §2643(d), 2666(b)(2), & Appendix II</i></p> | <p>No monitoring requirements if <u>all</u> criteria are met:</p> <ol style="list-style-type: none"> 1. Below-grade piping operates at less than atmospheric pressure; 2. Below-grade piping is sloped so the contents drain back into tank if suction is released; 3. No valves or pumps installed below grade in suction line. Only one check valve installed directly below and as close as practical to suction pump; and 4. Inspected by method that readily demonstrates that requirements 1 through 3 are met. <p><i>CCR §2636(a)(3) & 2641(b)</i></p> | <p>0.1 gph line tightness test every 24 months</p> <p><i>CCR §2643(e) & 2666(b)(2)</i></p> |

Monitoring Requirements for Double-Walled Piping Installed Before July 1, 2004

| Pressurized | Emergency Generator System with Underground Pressurized Piping | In Lieu of the Line Tightness Test | Suction | Gravity |
|--|---|--|---|---|
| <p>An LLD that restricts or shuts off flow when leak is detected;</p> <p style="text-align: center;">AND</p> <p>A line tightness test at least once every 12 months;</p> <p style="text-align: center;">AND EITHER</p> <p>1. A continuous monitoring system that activates an audible and visual alarm; or</p> <p>2. A continuous monitoring system that stops the flow of product at the dispenser when a leak is detected.</p> <p><i>CCR §2636(f)(1), (2), & (3)</i></p> | <p>An LLD that restricts, shuts off flow, or activates an audible and visual alarm;</p> <p style="text-align: center;">AND</p> <p>A line tightness test at least once every 12 months;</p> <p style="text-align: center;">AND</p> <p>Continuous monitoring system checked at least daily (<i>Inspection log required</i>);</p> <p style="text-align: center;">THAT EITHER</p> <p>1. Activates an audible and visual alarm; or</p> <p>2. Stops the flow of product when a leak is detected.</p> <p><i>CCR §2636(f)(1), (4), & (5) & 2666(f)</i></p> | <p>Continuous monitoring system shuts down the pump or stops the flow of product at the dispenser when a leak is detected in the UDC;</p> <p style="text-align: center;">AND</p> <p>Continuous monitoring system for all product piping located outside the UDC is fail-safe and shuts down the pump when a leak is detected.</p> <p><i>CCR §2636(f)(4)</i></p> | <p>Continuous interstitial monitoring for piping and UDC that activates an audible and visual alarm;</p> <p style="text-align: center;">OR</p> <p>Continuous monitoring for both the piping and UDC that stops the flow of product at the dispenser when a leak is detected.</p> <p><i>CCR §2636(f)(1)</i></p> | <p>Continuous monitoring for piping and UDC that activates an audible and visual alarm;</p> <p style="text-align: center;">OR</p> <p>Continuous monitoring for both the piping and the UDC that stops the flow at the dispenser when a leak is detected.</p> <p><i>CCR §2636(f)(1)</i></p> |

Monitoring Requirements for Double-Walled Piping Installed on or After July 1, 2004

| Performance Measure 1 | Performance Measure 2 | Performance Measure 3 |
|--|---|---|
| <p>The entire piping length, including piping within sumps or UDCs must be continuously monitored using vacuum, pressure, or interstitial liquid measurement methods;</p> <p style="text-align: center;">AND</p> <p>Sumps and UDCs require leak detection capable of detecting liquid and vapor releases from the primary containment;</p> <p style="text-align: center;">AND</p> <p>3.0 gph LLD required for pressurized piping.</p> <p><i>HSC §25290.1; LG 162</i></p> | <p>The interstitial space between the primary containment (i.e., SW transition pipe or fill piping) and secondary containment (i.e., sump or UDC) must be continuously monitored using vacuum or pressure;</p> <p style="text-align: center;">AND</p> <p>No leak detection in sumps or UDCs are required;</p> <p style="text-align: center;">AND</p> <p>3.0 gph LLD required for pressurized piping.</p> <p><i>HSC §25290.1; LG 162</i></p> | <p>The SW transition pipe must be contained within a DW sump or DW UDC that either: 1) extends to the surface; or 2) has a DW product tight lid that is continuously monitored using vacuum, pressure, or interstitial liquid level measurement methods;</p> <p style="text-align: center;">AND</p> <p>Sumps and UDCs are required to have leak detection to detect liquid releases or intrusion;</p> <p style="text-align: center;">AND</p> <p>3.0 gph LLD required for pressurized piping.</p> <p><i>HSC §25290.1; LG 162</i></p> |

Testing Requirements

| Test Type | Frequency | Notification and Documentation | Certifications/Method |
|---|---|---|---|
| Monitoring System Certification | Upon installation, at least once every 12 months, and following repairs (repairs includes reprogramming or cold starts). <i>CCR §2638(a)</i> | UPA notified 48 hours in advance. The “ <i>Monitoring System Certification Form</i> ” must be submitted to the UPA within 30 days of completion of the certification. <i>CCR §2638(d), (e), & (f); Appendix VI</i> | ICC Certified Service Technician with training obtained from the manufacturer of the monitoring equipment. <i>CCR §2715(f)</i> |
| Spill Containment (LG 166) | Upon installation, at least once every 12 months, and following repair. <i>HSC §25284.2; CCR §2637.1(a)</i> | UPA notified 48 hours in advance. The “ <i>Spill Container Testing Report Form</i> ” must be submitted to the UPA within 30 days of the completion of the test. <i>CCR §2637.1(d), (e), & (f); Appendix VIII</i> | ICC Certified Service Technician with training obtained from the manufacturer of the spill containment or through the developer of the testing equipment or method. <i>CCR §2715(f)</i> |
| Secondary Containment (LG 160) | Upon installation, six months after installation, at least once every 36 months, and following repair. <i>CCR §2637</i> | UPA notified 48 hours in advance. The “ <i>Secondary Containment Testing Report Form</i> ” must be submitted to the UPA within 30 days of the completion of the test. <i>CCR §2637(e), (f), & (g); Appendix VII</i> | ICC Certified Service Technician with training obtained from the manufacturer or through the developer of the testing equipment or method. <i>CCR §2715(f)</i> |
| Overfill Prevention Equipment Inspection (LG 150) | Upon installation, at least once every 36 months, and following repair. <i>CCR §2635(c)(2) & 2637.2(a)</i> | UPA notified 48 hours in advance. The “ <i>Overfill Prevention Equipment Inspection Report Form</i> ” must be submitted to the UPA within 30 days of the completion of the test. <i>CCR §2637.2(d), (e), & (f); Appendix IX</i> | ICC Certified Service Technician with training obtained from the manufacturer of the overfill prevention equipment. <i>HSC §25284.1; CCR §2635(c)(1), 2637.2(b)&(c), & 2715(f)</i> |
| Internal Lining Certification (LG 136) | Internally lined tanks must be recertified 120 months after lining, and every 60 months, thereafter. <i>CCR §2663(h)</i> | O/O must provide UPA with inspection certification within 30 days of completion of the inspection. <i>CCR §2663(h)</i> | A certification provided by a special inspector or coatings expert. <i>CCR §2663(h)(8)</i> |

Testing Requirements (continued)

| Test Type | Frequency | Notification and Documentation | Certifications/Method |
|---|---|--|---|
| <p>Enhanced Leak Detection (ELD) (LG 161)</p> | <p>Once notified by the State Water Board that a UST is within 1,000 feet of a public drinking water well, the O/O must perform an ELD test: 1) at least once every 36 months for SW component systems; or 2) once for DW UST systems.</p> <p style="text-align: center;">AND</p> <p>USTs installed on or after July 1, 2003 must be tested after installation, but before system is operational.</p> <p><i>HSC §25289, 25290.2(i), 25292.4(d), & 25292.5(c)</i></p> | <p>UPA and State Water Resources Control Board, Office of Tank Tester Licensing notified 48 hours in advance.</p> <p>Results of testing must be submitted to the State Water Board UST Program and to the UPA within 60 days after the test has been performed. If the test fails, the UPA must be notified within 60 days.</p> <p>If an unauthorized release is confirmed, the O/O must comply with CCR, article 5. Within 24 hours, the O/O must notify the UPA, investigate the condition, and take immediate measures to stop the release. A release report shall be submitted to the UPA within five working days of the release. If necessary or as required by the UPA, the O/O must remove the remaining stored substance from the UST system.</p> <p><i>HSC §25295(a); CCR §2644.1(a)(4) & (5) & 2652(a), (b), & (c); California Code of Regulations, title 23, division 3, chapter 17, §2771</i></p> | <p>A UST tank tester licensed by the Office of Tank Tester Licensing must perform an ELD test capable of detecting both liquid and vapor phase releases at a leak rate of at least 0.005 gph, with a probability of detection of at least 95% and a probability of false alarm no greater than 5%.</p> <p><i>CCR §2644.1(a)(2); California Code of Regulations, title 23, division 3, chapter 17, §2771</i></p> |

Pursuant to *CCR §2620(e)*, all testing and inspections shall be completed before or during the month the testing or inspection is required. Test and inspections shall not exceed the maximum number of months included in the regulations.