Inspection of UST Overfill Prevention Equipment

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County of Santa Clara DEH HMCD
What and When?

USTs installed before October 1, 2018 must have their overfill prevention equipment inspected by October 13, 2018 and every 36 months thereafter; and within 30 days of the date of the completion of a repair. [23 CCR §2637.2(a)(1)]
What and When?

USTs installed on or after October 1, 2018 must have their overfill prevention equipment inspected upon the completion of an installation and every 36 months thereafter; and within 30 days of the date of the completion of a repair. [23 CCR §2637.2(a)(2)]
What and When?

• Periodic inspections must be completed anytime before or during the month the testing is required. [23 CCR §2620(e)]

• Conducting an inspection late does not change the due date for the next periodic inspection (i.e., if an inspection due by October 13, 2018 is not done until December of 2018, the future inspections are due any time during October of 2021 and every 36 months thereafter).
Who?

Overfill prevention equipment inspections must be performed by a UST Service Technician meeting the requirements of 23 CCR §2715(f). [23 CCR §2637.2(c)]
Who?

• The requirement to be trained and certified by the manufacturer may be obtained through certification by the manufacturer of the equipment being inspected or through the developer of the inspection method being used. [23 CCR §2715(f)(2)(D)]

• If no training or certification exists that would satisfy the above criteria, the Unified Program Agency (UPA) may approve comparable alternate training or certification. [23 CCR §2715(f)(2)(E)]
How?

Inspections must demonstrate that the equipment: [23 CCR §2637.2(b)]

1. Is set to activate at the correct level; and
2. Will activate when stored substance reaches that level.
How?

Inspections must be performed: [23 CCR §2637.2(b)]

• In accordance with the manufacturer's guidelines or standards.

• Using an applicable method specified in an industry code or engineering standard if there are no manufacturer's guidelines or standards.
How?

• Using a method approved by a registered PE if there are no applicable manufacturer’s guidelines or standards, industry codes, or engineering standards.

Note: The PE option is usually N/A since the Petroleum Equipment Institute’s (PEI) Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities (PEI/RP1200-17) addresses most equipment.
Step 1 - Identify **What** must be inspected

USTs not exempted per 23 CCR §2635(c)(2) must be equipped with an overfill prevention system which does not allow for manual override and meets one of the options in 23 CCR §2635(c)(1).

- Mechanical overfill prevention (flapper) valve
- Flow restrictor (ball float valve)
- Alarm(s)
Step 1 - What

• Some facilities have more equipment than is required.

• Only the equipment associated with the option used to comply with 23 CCR §2635(c)(1) (i.e., “Required Equipment”) must be inspected.

• “Required Equipment” must be checked on the CERS UST – Tank Information page; optional equipment should not.
“Required Equipment” and activation levels are specified in 23 CCR §2635(c)(1) and depend on the overfill prevention option used:

- **A1**: Alert the transfer operator when the tank is 90% full by restricting the flow into the tank. [23 CCR §2635(c)(1)(A)]
  - Flow restrictor (ball float) installed below vent riser @ 90%

- **A2**: Or alert the transfer operator when the tank is 90% full by triggering an audible and visual alarm. [23 CCR §2635(c)(1)(A)]
  - External audible & visual alarm unit @ 90%

- **B**: 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% of capacity; and activate an audible alarm at least 5 minutes before the tank overfills. [23 CCR §2635(c)(1)(B)]
  - Flow restrictor (ball float) installed below vent riser @ ≤95% and external audible alarm unit

- **C**: Provide positive shut-off of flow to the tank when the tank is filled to no more than 95% of capacity. [23 CCR §2635(c)(1)(C)]
  - Mechanical overfill prevention (flapper) valve @ 95%

- **D**: 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. [23 CCR §2635(c)(1)(D)]
  - Mechanical overfill prevention (flapper) valve @ >95%
Step 2 - Identify **how** it must be inspected

Does the manufacturer have an inspection procedure?

- If Yes, that procedure must be used.
- If No, use an industry standard (e.g., PEI/RP1200) along with the manufacturer’s installation instructions to verify proper activation level and functionality.
Step 2 - How

- Steel tanks are cylinders.
- Fiberglass tanks are cylinders with rounded ends.

1” of product at 50% of tank height holds many more gallons than 1” of product at 90%.
Step 2 - How

- Compartmented fiberglass tanks have a **BASE TANK** that has two convex ends and an **END TANK** that has one convex end and one concave end.
Step 2 - How

• For each piece of “Required Equipment,” determine the percent of tank capacity at which it must activate per 23 CCR §2635(c)(1): 90% or 95%

• Use the manufacturer’s tank calibration chart to determine the product depth inch-level corresponding to that percentage
Step 2 – How (Option C)

• Example: 6,000 gallon 6 foot diameter fiberglass tank using mechanical overfill prevention valve per Option C.

Use tank chart...
Step 2 – How (Option C)

Determine actual gallon capacity of the tank (no math needed):

<table>
<thead>
<tr>
<th>DIPSTICK READING</th>
<th>GALLONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>70-1/4”</td>
<td>5839</td>
</tr>
<tr>
<td>70-3/8”</td>
<td>5840</td>
</tr>
</tbody>
</table>

100% = 5,840 gallons @ 70.375”

Note: Actual volume of this “6,000 Gallon - 6’ Diameter” tank is not 6,000 gallons; and actual diameter is not 6’ (72”).
Step 2 – How (Option C)

Determine Gallons @ 95% (level at which Option C requires flow to shut-off)

95% = 5,840 x 0.95 = 5,548 gallons

Using tank chart 5,548 gallons = approx. 63.25”

Note: These same principles apply to ATG alarms and ball floats.
Step 2 – How (Option B)

• Example: 6,000 gallon 6 foot diameter fiberglass tank using ball float and audible alarm per Option B.

Use tank chart...
Step 2 – How (Option B)

Fill rate and tank capacity are used to confirm proper activation.

Determine actual gallon capacity of the tank:

<table>
<thead>
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</tr>
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<tbody>
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</tr>
<tr>
<td>70-3/8&quot;</td>
<td>5840</td>
</tr>
</tbody>
</table>

100% = 5,840 gallons
Step 2 – How (Option B)

• Determine tank fill rate in gallons-per-minute (check with transporter).

  For this example, assume 60 g.p.m. fill rate
  30 minutes of flow = 60 x 30 = 1,800 gallons
  5 minutes of flow = 60 x 5 = 300 gallons
Step 2 – How (Option B)

- Ball float must restrict flow $\geq$ 30 minutes prior to overfill or $\leq$ 95% of tank capacity, whichever comes first:
  
  30 minutes = $(5,840 - 1,800) = 4,040$ gallons
  
  95% of 5,840 = 5,548 gallons

  Ball float must activate $\leq$ approx. 45.7”

<table>
<thead>
<tr>
<th>DIPSTICK READING</th>
<th>GALLONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-1/2&quot;</td>
<td>4023</td>
</tr>
<tr>
<td>45-5/8&quot;</td>
<td>4036</td>
</tr>
<tr>
<td>45-3/4&quot;</td>
<td>4049</td>
</tr>
</tbody>
</table>
Step 2 – How (Option B)

- Audible alarm must activate 5 minutes prior to overfill:
  
  $5 \text{ minutes} = (5,840 - 300) = 5,540 \text{ gallons}$

  Alarm must activate @ $\leq$ approx. 63.1”

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>63&quot;</td>
<td>5533</td>
</tr>
<tr>
<td>63-1/8&quot;</td>
<td>5541</td>
</tr>
<tr>
<td>63-1/4&quot;</td>
<td>5549</td>
</tr>
</tbody>
</table>
Industry Standards

• Industry codes and engineering standards must be peer reviewed and published.

• PEI’s Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities (PEI/RP1200-17) is an industry standard.

• The following pages summarize RP1200-17’s inspection procedures for overfill prevention equipment.
PEI/RP1200 – ATG Overfill Alarm

• Measure product level at the ATG probe riser and compare to the ATG console’s reading to confirm ATG accuracy.

• Verify that ATG is programmed to activate the external overfill alarm unit when the tank is no more than 90% full.

• Confirm that the overfill alarm circuit is operational.

• Activate the overfill alarm to confirm operation of alarms.

• Disconnect the ATG probe cable and remove the probe from the tank.
PEI/RP1200 – ATG Overfill Alarm

• Inspect the probe and confirm that the floats move freely.
• Reconnect the ATG probe cable.
• Move the fuel float to the middle of the probe and confirm that the ATG panel shows the correct product height in inches.
• Slowly move the fuel float up the probe until the overfill alarm triggers.
• At the point where the overfill alarm triggered, measure the distance from the bottom of the probe to the bottom of the fuel float.
PEI/RP1200 – ATG Overfill Alarm

• Using the tank chart, find the volume that corresponds to the float height and determine the % of tank capacity.

• Compare the measurements to the values programmed in the ATG console.

• Reinstall ATG probe.

• Pass Criteria = Alarms activate when the tank is no more than 90% full and fuel level on the ATG console agrees with the gauge stick reading.
PEI/RP1200 – Overfill Prevention Valve

• Remove drop tube.
• Inspect valve and float for damage or corrosion; remove debris.
• Verify free movement of float mechanism.
• With the float mechanism in shutoff position, confirm that shutoff valve will move into the product flow path.
• If possible, verify that the bypass valve is free of blockage.
PEI/RP1200 – Overfill Prevention Valve

• Using the manufacturer's procedure, examine the drop tube and shutoff valve to determine if product flow will be completely shut off at 95% of tank capacity. Make any adjustments necessary to ensure that flow will be completely shut off when the tank is no more than 95% full.

• Reinstall drop tube.

• Pass Criteria = Device functions as designed and complete shutoff of product flow is able to occur when the tank is no more than 95% full.
PEI/RP1200 – Ball Float

• Verify that all tank-top fittings are vapor-tight.
• Remove the ball float assembly.
• Visually inspect the float and cage and remove any debris or foreign objects.
• Check the ball for holes and cracks, free movement in the cage, and corrosion that affects proper operation of the ball float.
• Check the vent orifice to confirm that it is located near the top of the tank and open.
PEI/RP1200 – **Ball Float**

- Refer to the manufacturer's installation procedure to confirm that vapor flow will be restricted when the tank is no more than 90% full.
- Reinstall the ball float per the manufacturer's installation instructions.
- **Pass Criteria** = Ball float functions as designed, flow restriction occurs when the tank is no more than 90% full, and the tank-top fittings are vapor-tight.
Other Ball Float Issues

• Ball float valves should **not** be used with suction piping systems or pressure delivery systems.

• If using Options A or B, ball floats must be installed at each tank top opening from which the tank could vent during delivery.

• When a ball float and flapper are both installed, the point where the vent riser pipe terminates inside the tank above the ball float must be higher than the flapper valve shutoff level.
Inspection Notification

• The UST owner/operator must notify the UPA at least 48 hours prior to conducting an overfill prevention inspection.

[23 CCR §2637.2(f)]
Inspection Documentation

- Inspection results must be recorded on the Overfill Prevention Equipment Inspection Report Form in Appendix IX of 23 CCR.

[23 CCR §2637.2(d)]
Documentation

- This form is required for installation, repair, and periodic inspections.
• The UST Service Technician must list applicable training and certifications they possess.
Documentation

- The technician must identify the inspection method(s) used.

<table>
<thead>
<tr>
<th>Inspection Method Used:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer Guidelines (Specify):</td>
</tr>
<tr>
<td>Industry Code or Engineering Standard (Specify):</td>
</tr>
<tr>
<td>Engineered Method (Specify):</td>
</tr>
</tbody>
</table>

- Copies of the inspection procedures and all documentation required to determine the results must be attached.
• The technician must provide all requested data, answer all questions, and indicate Pass or Fail for each component inspected.
Documentation

• The technician must provide an explanation for any item marked “Fail”
Submittal

• Pass or fail, the UST owner/operator must submit a copy of the Overfill Prevention Equipment Inspection Report Form and required attachments to the local UPA within 30 days of completion of the inspection. [23 CCR §2637.2(e)]
Record Keeping

• The UST owner/operator must maintain overfill prevention equipment inspection records on-site, or off-site at a readily accessible location if approved by the local UPA, for at least 36 months. These records must be made available, upon request within 36 hours, to the local UPA or the State Water Resources Control Board. [23 CCR §2712(b)(1)(G)]
Retrofits

• Effective October 1, 2018, installation of new/replacement vent riser pipe ball floats does not satisfy the overfill prevention requirements of 23 CCR §2635. [23 CCR §2635(d)]
Retrofits

• USTs using overfill prevention Options A1 or B must switch to another allowed overfill prevention option if a ball float becomes non-functional (ball floats cannot be replaced like-for-like). [23 CCR §2665(c)]
Retrofits

- Per 23 CCR §2636(a)(1), vent and riser piping in UST systems installed between July 2, 1987 and June 30, 2003 is only exempt from secondary containment, SB 989 testing, interstitial monitoring, and corrosion protection if overfill prevention Options B or C are used. If these systems have single-wall underground vent lines or direct-buried spill buckets, they cannot use Options A2 or D.
Options allowed depend on UST system installation date and construction.

<table>
<thead>
<tr>
<th>Tank Install Date</th>
<th>Option A1 OK?</th>
<th>Option A2 OK?</th>
<th>Option B OK?</th>
<th>Option C OK?</th>
<th>Option D OK?</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/1/2003 - Present</td>
<td>Yes if Ball Float (BF) installed prior to 10/1/2018</td>
<td>Yes</td>
<td>Yes if BF installed prior to 10/1/2018&lt;br&gt; No if BF installed on or after 10/1/2018</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No if BF installed on or after 10/1/2018</td>
<td></td>
<td>No if BF installed prior to 10/1/2018&lt;br&gt; No if BF installed on or after 10/1/2018</td>
<td>No if BF installed on or after 10/1/2018</td>
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<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>Yes if BF installed prior to 10/1/2018&lt;br&gt; No if BF installed on or after 10/1/2018</td>
<td>No if BF installed prior to 10/1/2018&lt;br&gt; No if BF installed on or after 10/1/2018</td>
<td>No if BF installed prior to 10/1/2018&lt;br&gt; No if BF installed on or after 10/1/2018</td>
</tr>
<tr>
<td>7/2/1987 – 6/30/2003</td>
<td>Yes if UST has monitored fill sump and DW U/G Vent Line and BF installed prior to 10/1/2010</td>
<td>Yes if UST has monitored fill sump and DW U/G Vent Line</td>
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<td>Yes</td>
<td>Yes</td>
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<tr>
<td></td>
<td>No if direct bury spill bucket</td>
<td>No if direct bury spill bucket</td>
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<td>No if BF installed prior to 10/1/2018&lt;br&gt; No if BF installed on or after 10/1/2018</td>
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</tr>
<tr>
<td></td>
<td>No if unmonitored fill sump</td>
<td>No if unmonitored fill sump</td>
<td>No if BF installed prior to 10/1/2018&lt;br&gt; No if BF installed on or after 10/1/2018</td>
<td>No if BF installed prior to 10/1/2018&lt;br&gt; No if BF installed on or after 10/1/2018</td>
<td>No if BF installed prior to 10/1/2018&lt;br&gt; No if BF installed on or after 10/1/2018</td>
</tr>
<tr>
<td></td>
<td>No if SW or unmonitored U/G Vent Line</td>
<td>No if SW or unmonitored U/G Vent Line</td>
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<td>No if BF installed prior to 10/1/2018&lt;br&gt; No if BF installed on or after 10/1/2018</td>
<td>No if BF installed prior to 10/1/2018&lt;br&gt; No if BF installed on or after 10/1/2018</td>
</tr>
<tr>
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<td>Yes</td>
<td>Yes if BF installed prior to 10/1/2018&lt;br&gt; No if BF installed on or after 10/1/2018</td>
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Note: The table details the allowed overfill prevention methods based on the installation date of the UST system.
The Unidocs website has:

- *Overfill Prevention Equipment Inspection Report Form* (UN-109)
- *Underground Storage Tank System Overfill Prevention Equipment Inspection Requirements* (UN-117)
Resources

www.waterboards.ca.gov/water_issues/programs/ust/leak_prevention/index.html

The State Water Resources Control Board UST Leak Prevention Program website has:

• LG 150-2: Underground Storage Tank Overfill Prevention Systems
• Overfill Prevention Equipment Inspection Report Form