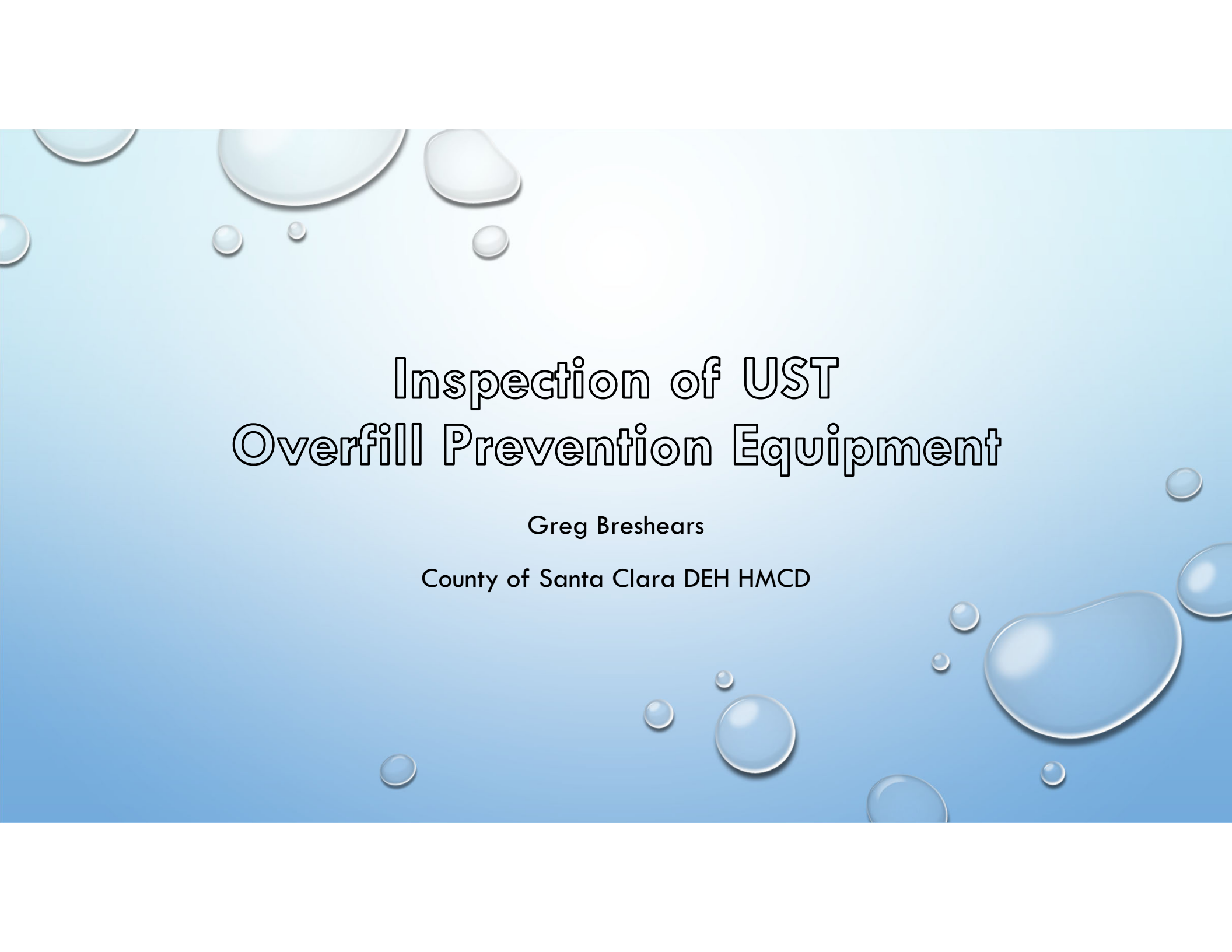


The background of the slide is a light blue gradient. It is decorated with several realistic water droplets of various sizes, some with highlights and shadows, giving them a 3D appearance. The droplets are scattered across the slide, with a higher concentration in the top left and bottom right corners.

Inspection of UST Overfill Prevention Equipment

Greg Breshears

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:

Options

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



AND



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%**



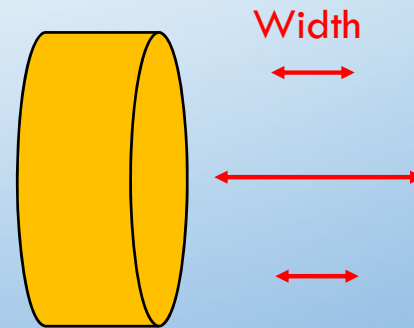
Step 2 - Identify how it must be inspected

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.

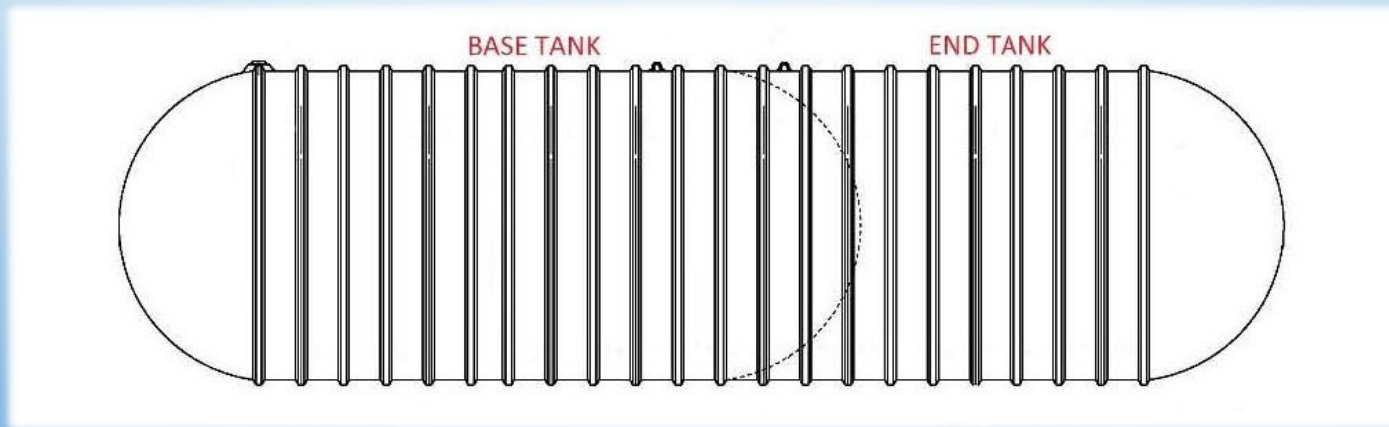
Step 2 - How

- 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...



Calibration Chart
6,000 Gallon - 6' Diameter Double-Wall Tank

DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS
0-1/8"	3	7-1/4"	311	14-3/8"	842	21-1/2"	1498	28-5/8"	2228
0-1/4"	5	7-3/8"	319	14-1/2"	853	21-5/8"	1510	28-3/4"	2241
0-3/8"	7	7-1/2"	327	14-5/8"	863	21-3/4"	1523	28-7/8"	2254
0-1/2"	10	7-5/8"	335	14-3/4"	874	21-7/8"	1535	29"	2268
0-5/8"	12	7-3/4"	343	14-7/8"	885	22"	1547	29-1/8"	2281
0-3/4"	15	7-7/8"	351	15"	895	22-1/8"	1560	29-1/4"	2294
0-7/8"	18	8"	359	15-1/8"	906	22-1/4"	1572	29-3/8"	2307
1"	21	8-1/8"	367	15-1/4"	917	22-3/8"	1585	29-1/2"	2321
1-1/8"	24	8-1/4"	376	15-3/8"	928	22-1/2"	1597	29-5/8"	2334

Step 2 – How (Option C)

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

DIPSTICK READING	GALLONS
70-1/4"	5839
70-3/8"	5840



100% = 5,840 gallons @ 70.375"

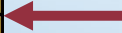
Note: Actual volume of this "6,000 Gallon - 6' Diameter" tank is not 6,000 gallons; and actual diameter is not 6' (72").

Step 2 – How (Option C)

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

$$95\% = 5,840 \times 0.95 = 5,548 \text{ gallons}$$

DIPSTICK READING	GALLONS
63-1/8"	5541
63-1/4"	5549
63-3/8"	5556



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...



Calibration Chart
6,000 Gallon - 6' Diameter Double-Wall Tank

DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS	DIPSTICK READING	GALLONS
0-1/8"	3	7-1/4"	311	14-3/8"	842	21-1/2"	1498	28-5/8"	2228
0-1/4"	5	7-3/8"	319	14-1/2"	853	21-5/8"	1510	28-3/4"	2241
0-3/8"	7	7-1/2"	327	14-5/8"	863	21-3/4"	1523	28-7/8"	2254
0-1/2"	10	7-5/8"	335	14-3/4"	874	21-7/8"	1535	29"	2268
0-5/8"	12	7-3/4"	343	14-7/8"	885	22"	1547	29-1/8"	2281
0-3/4"	15	7-7/8"	351	15"	895	22-1/8"	1560	29-1/4"	2294
0-7/8"	18	8"	359	15-1/8"	906	22-1/4"	1572	29-3/8"	2307
1"	21	8-1/8"	367	15-1/4"	917	22-3/8"	1585	29-1/2"	2321
1-1/8"	24	8-1/4"	376	15-3/8"	928	22-1/2"	1597	29-5/8"	2334

Step 2 – How (Option B)

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

Determine actual gallon capacity of the tank:

DIPSTICK READING	GALLONS
70-1/4"	5839
70-3/8"	5840



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 = $60 \times 30 = 1,800$ gallons

5 minutes of flow = $60 \times 5 = 300$ gallons

Step 2 – How (Option B)

- Ball float must restrict of flow ≥ 30 minutes prior to overflow 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"

DIPSTICK READING	GALLONS
45-1/2"	4023
45-5/8"	4036
45-3/4"	4049



Step 2 – How (Option B)

- Audible alarm must activate 5 minutes prior to overfill:

5 minutes = $(5,840 - 300) = 5,540$ gallons

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

DIPSTICK READING	GALLONS
63"	5533
63-1/8"	5541
63-1/4"	5549



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/RP1 200-17) is an industry standard.
- The following pages summarize RP1 200-17's inspection procedures for overfill prevention equipment.

PEI/RP1 200 – 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/RP1 200 – 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/RP1 200 – 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/RP1 200 – 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/RP1 200 – 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/RP1 200 – 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)]

UNDERGROUND STORAGE TANK OVERFILL PREVENTION EQUIPMENT INSPECTION REPORT FORM (Page 1 of 1)				
Type of Action ☐ Installation Inspection ☐ Repair Inspection ☐ 56 Month Inspection				
I. FACILITY INFORMATION				
CERS ID		Date of Overfill Prevention Equipment Inspection		
Business Name (Same as Facility Name or DBA-Doing Business As)				
Business Site Address		City	ZIP Code	
II. UNDERGROUND STORAGE TANK SERVICE TECHNICIAN INFORMATION				
Name of UST Service Technician Performing the Inspection (Print as shown on the ICC Certification)				
Contractor / Tank Tester License #		ICC Certification #	ICC Certification Expiration Date	
Overfill Prevention Equipment Inspection Training and Certifications (List applicable certifications)				
III. OVERFILL PREVENTION EQUIPMENT INSPECTION INFORMATION				
Inspection Method Used:				
☐ Manufacturer Guidelines (Specify):				
☐ Industry Code or Engineering Standard (Specify):				
☐ Engineered Method (Specify):				
Attach the inspection procedures and all documentation required to determine the results.				# of Attached Pages
TANK ID: (By tank number, stored product, etc.)				
What is the tank inside diameter? (inches)				
Is the fill piping secondarily contained?				
Is the vent piping secondarily contained?				
Overfill Prevention Equipment Manufacturer(s)				
What is the overfill prevention equipment response when activated?				
Are flow restrictors installed on vent piping?				
At what level in the tank is the overfill prevention set to activate? (inches from bottom of tank)				
What is the percent capacity of the tank at which the overfill prevention equipment activates?				
Is the overfill prevention in proper operating condition to respond when the substance reaches the appropriate level?				
IV. SUMMARY OF INSPECTION RESULTS				
Overfill Prevention Inspection Results				
V. COMMENTS				
Any items marked "Fail" must be explained in this section. Any additional comments may also be provided here.				
VI. CERTIFICATION BY UST SERVICE TECHNICIAN CONDUCTING THIS INSPECTION				
I hereby certify that the overfill prevention equipment was inspected in accordance with California Code of Regulations, Title 23, Division 3, Chapter 16, Section 2637.2 and all the information contained herein is accurate.				
UST Service Technician Signature				
If the facility has more components than this form accommodates, additional copies of this page may be attached.				
CERS = California Environmental Reporting System; ID = Identification; UST = Underground Storage Tank; ICC = International Code Council; ANV = Audible and Visual				

Documentation

- This form is required for installation, repair, and periodic inspections.

UNDERGROUND STORAGE TANK OVERFILL PREVENTION EQUIPMENT INSPECTION REPORT FORM (Page 1 of 1)		
Type of Action	☐ Installation Inspection	☐ Repair Inspection ☐ 36 Month Inspection
I. FACILITY INFORMATION		
CERS ID	Date of Overfill Prevention Equipment Inspection	
Business Name (Same as Facility Name or DBA-Doing Business As)		
Business Site Address	City	ZIP Code

Documentation

- The UST Service Technician must list applicable training and certifications they possess.

II. UNDERGROUND STORAGE TANK SERVICE TECHNICIAN INFORMATION		
Name of UST Service Technician Performing the Inspection <i>(Print as shown on the ICC Certification.)</i>		Phone #
Contractor / Tank Tester License #	ICC Certification #	ICC Certification Expiration Date
Overfill Prevention Equipment Inspection Training and Certifications <i>(List applicable certifications.)</i>		

Documentation

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

III. OVERFILL PREVENTION EQUIPMENT INSPECTION INFORMATION	
Inspection Method Used:	☐ Manufacturer Guidelines <i>(Specify)</i> :
	☐ Industry Code or Engineering Standard <i>(Specify)</i> :
	☐ Engineered Method <i>(Specify)</i> :
Attach the inspection procedures and all documentation required to determine the results.	
# of Attached Pages	

- Copies of the inspection procedures and all documentation required to determine the results must be attached.

Documentation

- The technician must provide all requested data, answer all questions, and indicate Pass or Fail for each component inspected.

TANK ID: <i>(By tank number, stored product, etc.)</i>				
What is the tank inside diameter? <i>(Inches)</i>				
Is the fill piping secondarily contained?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Is the vent piping secondarily contained?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Overfill Prevention Equipment Manufacturer(s)				
What is the overfill prevention equipment response when activated? <i>(Check all that apply.)</i>	☐ Shuts Off Flow ☐ Restricts Flow ☐ A/V Alarm	☐ Shuts Off Flow ☐ Restricts Flow ☐ A/V Alarm	☐ Shuts Off Flow ☐ Restricts Flow ☐ A/V Alarm	☐ Shuts Off Flow ☐ Restricts Flow ☐ A/V Alarm
Are flow restrictors installed on vent piping?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
At what level in the tank is the overfill prevention set to activate? <i>(Inches from bottom of tank.)</i>				
What is the percent capacity of the tank at which the overfill prevention equipment activates?				
Is the overfill prevention in proper operating condition to respond when the substance reaches the appropriate level?	☐ Yes ☐ No <i>(Specify in V.)</i>	☐ Yes ☐ No <i>(Specify in V.)</i>	☐ Yes ☐ No <i>(Specify in V.)</i>	☐ Yes ☐ No <i>(Specify in V.)</i>
IV. SUMMARY OF INSPECTION RESULTS				
Overfill Prevention Inspection Results	☐ Pass ☐ Fail	☐ Pass ☐ Fail	☐ Pass ☐ Fail	☐ Pass ☐ Fail

Documentation

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

V. COMMENTS
<i>Any items marked “Fail” must be explained in this section. Any additional comments may also be provided here.</i>
VI. CERTIFICATION BY UST SERVICE TECHNICIAN CONDUCTING THIS INSPECTION
I hereby certify that the overfill prevention equipment was inspected in accordance with California Code of Regulations, Title 23, Division 3, Chapter 16, Section 2637.2 and all the information contained herein is accurate.
UST Service Technician Signature

If the facility has more components than this form accommodates, additional copies of this page may be attached.

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.

Allowed Overfill Prevention Methods

Tank Install Date	Option A1 OK?	Option A2 OK?	Option B OK?	Option C OK?	Option D OK?
7/1/2003 - Present	➤ Yes if Ball Float (BF) installed prior to 10/1/2018 ➤ No if BF installed on or after 10/1/2018	➤ Yes	➤ Yes if BF installed prior to 10/1/2018 ➤ No if BF installed on or after 10/1/2018	➤ Yes	➤ Yes
7/2/1987 – 6/30/2003	➤ Yes if UST has monitored fill sump <i>and</i> DW U/G Vent Line <i>and</i> BF installed prior to 10/1/2018 ➤ No if direct bury spill bucket ➤ No if unmonitored fill sump ➤ No if SW or unmonitored U/G Vent Line ➤ No if BF installed on or after 10/1/2018	➤ Yes if UST has monitored fill sump <i>and</i> DW U/G Vent Line ➤ No if direct bury spill bucket ➤ No if unmonitored fill sump ➤ No if SW or unmonitored U/G Vent Line	➤ Yes if BF installed prior to 10/1/2018 ➤ No if BF installed on or after 10/1/2018	➤ Yes	➤ Yes if UST has monitored fill sump <i>and</i> DW U/G Vent Line ➤ No if direct bury spill bucket ➤ No if unmonitored fill sump ➤ No if SW or unmonitored U/G Vent Line
On or before 7/1/1987	➤ Yes if BF installed prior to 10/1/2018 ➤ No if BF installed on or after 10/1/2018	➤ Yes	➤ Yes if BF installed prior to 10/1/2018 ➤ No if BF installed on or after 10/1/2018	➤ Yes	➤ Yes

Resources

www.unidocs.org

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*