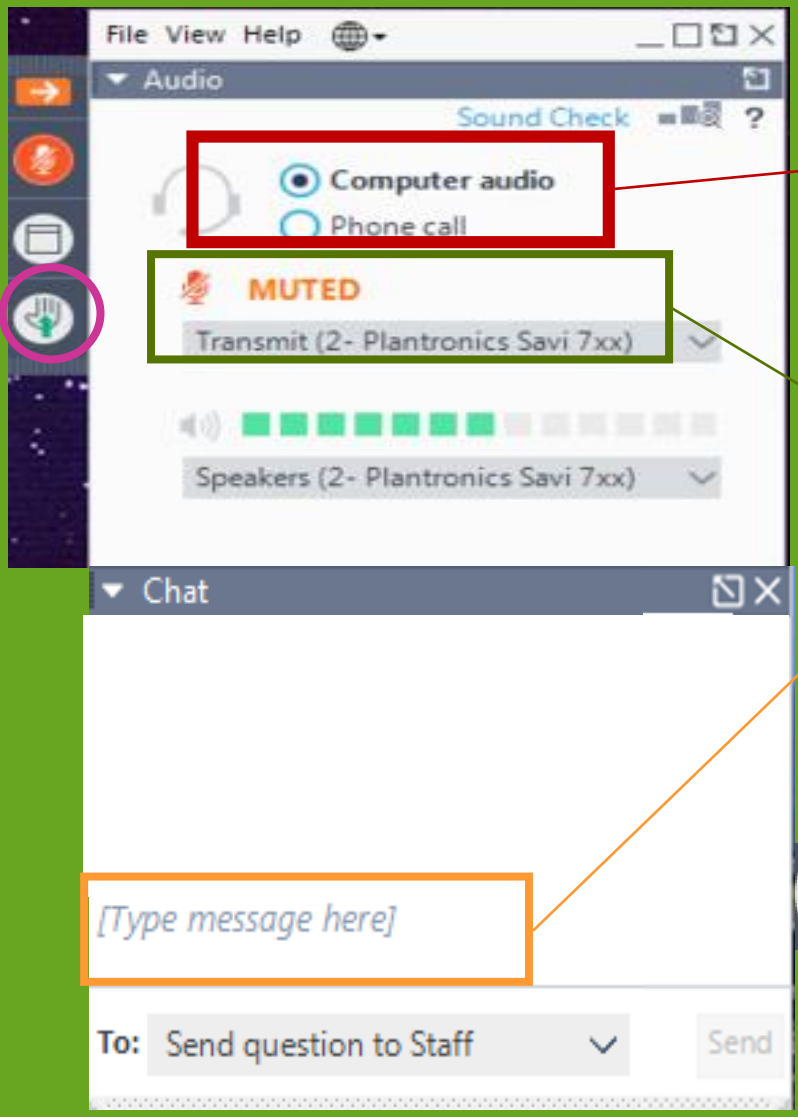
# USING GOTOWEBINAR

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NE IW PCC

# SPILL BUCKET/ CONTAINMENT SUMP TESTING AND REPAIR

NE IW PCC

4/30/2020

# Today's Speakers

Russ Brauksieck- Senior Analyst, *EPA*

Ed Kubinsky- Director of Regulatory Affairs, Training and Certification, *Crompco, LLC*

Tony Rieck- President/CEO,

*T.R. Consulting, Inc.*

Roland Riegel- PDE – Flammable Liquids Containment Products,

*Underwriters Laboratories Inc.*

# Training overview

1. Russ- Policy Background of Spill Bucket and Containment Sump Testing
2. Ed- Licensing to Perform UST Testing, PEI RP 1200
3. Roland- UL 2447
4. Tony- NLPA/KWA 823 Standard

# Spill Bucket and Containment Sump Testing

**Russ Brauksieck**
**EPA Office of Underground Storage Tanks**

# When is spill prevention equipment and sump testing required according to Part 280?

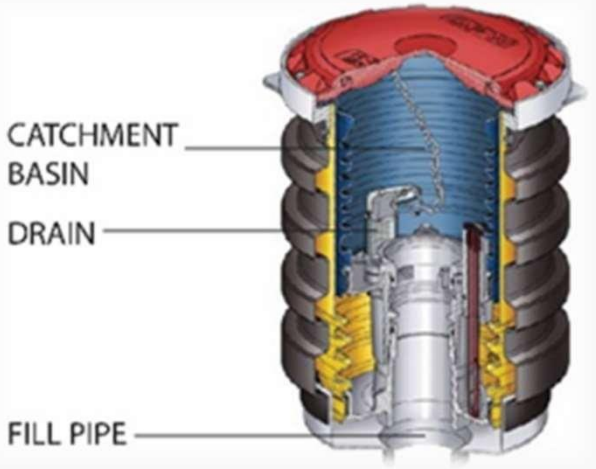
Spill prevention equipment and containment sumps used for interstitial monitoring of piping must prevent releases to the environment by meeting one of the following:

(i) The equipment is double walled and the integrity of both walls is periodically monitored at a frequency not less than the frequency of the walkthrough inspections or

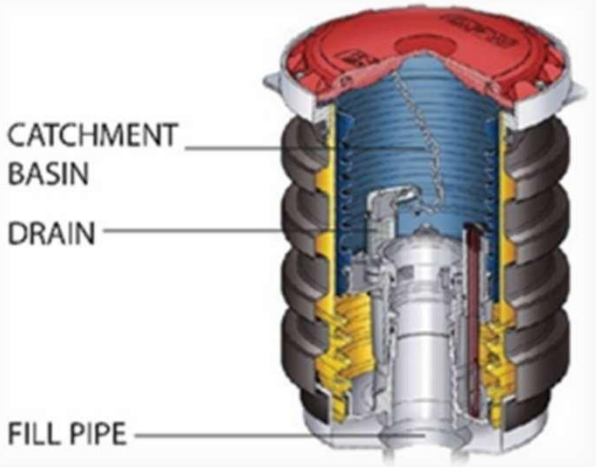
(ii)The spill prevention equipment and containment sumps used for interstitial monitoring of piping are tested at least once every three years to ensure the equipment is liquid tight by using vacuum, pressure, or liquid testing…

# Spill Buckets

- What has to be tested?
  - Spill buckets at fill ports where delivery hose is disconnected



# Spill Buckets



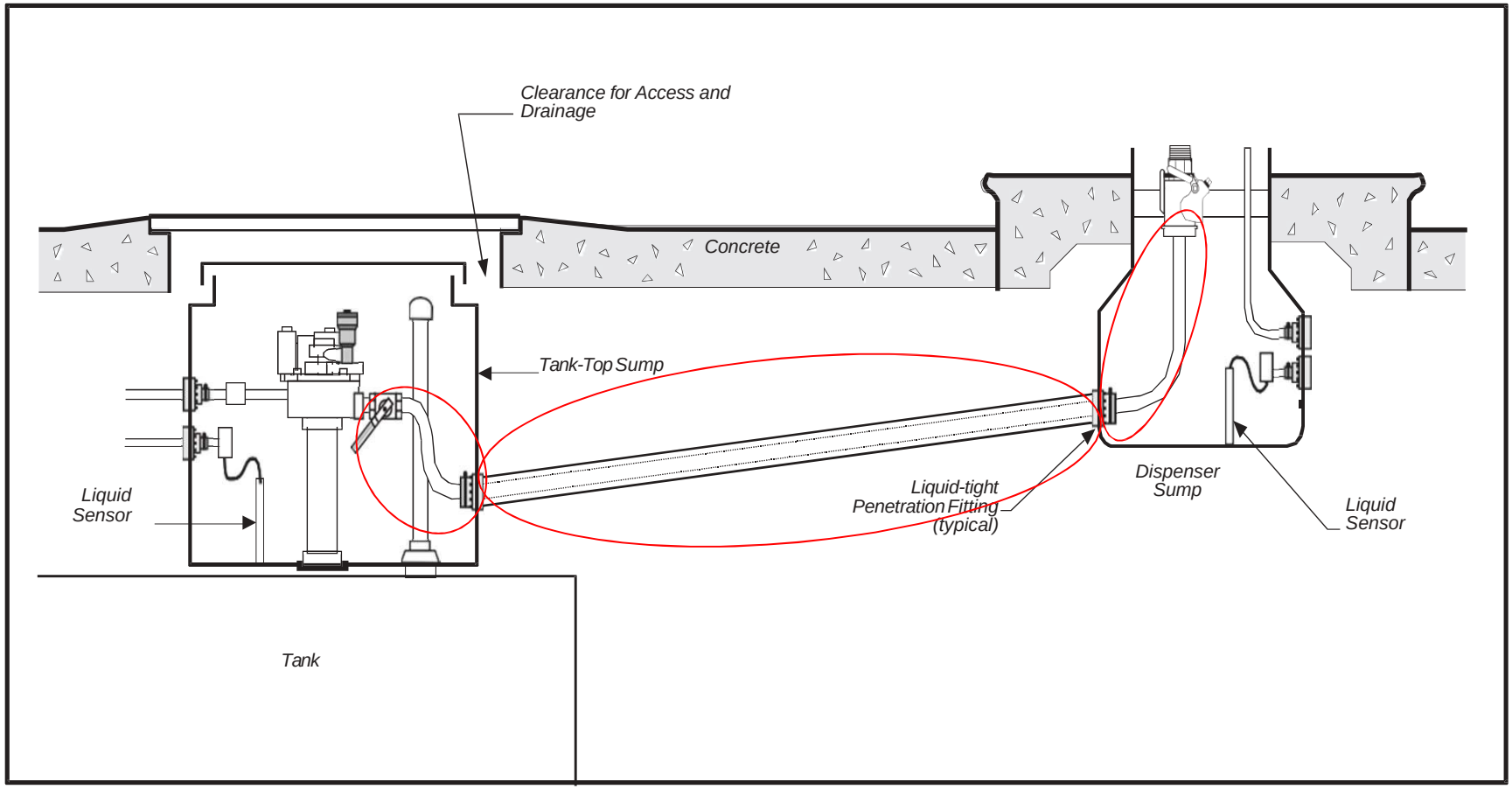

- What has to be tested?
  - Spill buckets at fill ports where delivery hose is disconnected
- What does not have to be tested?
  - Spill buckets at vapor recovery ports
  - Double-wall spill buckets where the integrity of both wall is periodically monitored (monitored every 30 days or before each delivery if interval of receiving delivery is more than 30 days)

# Containment Sumps

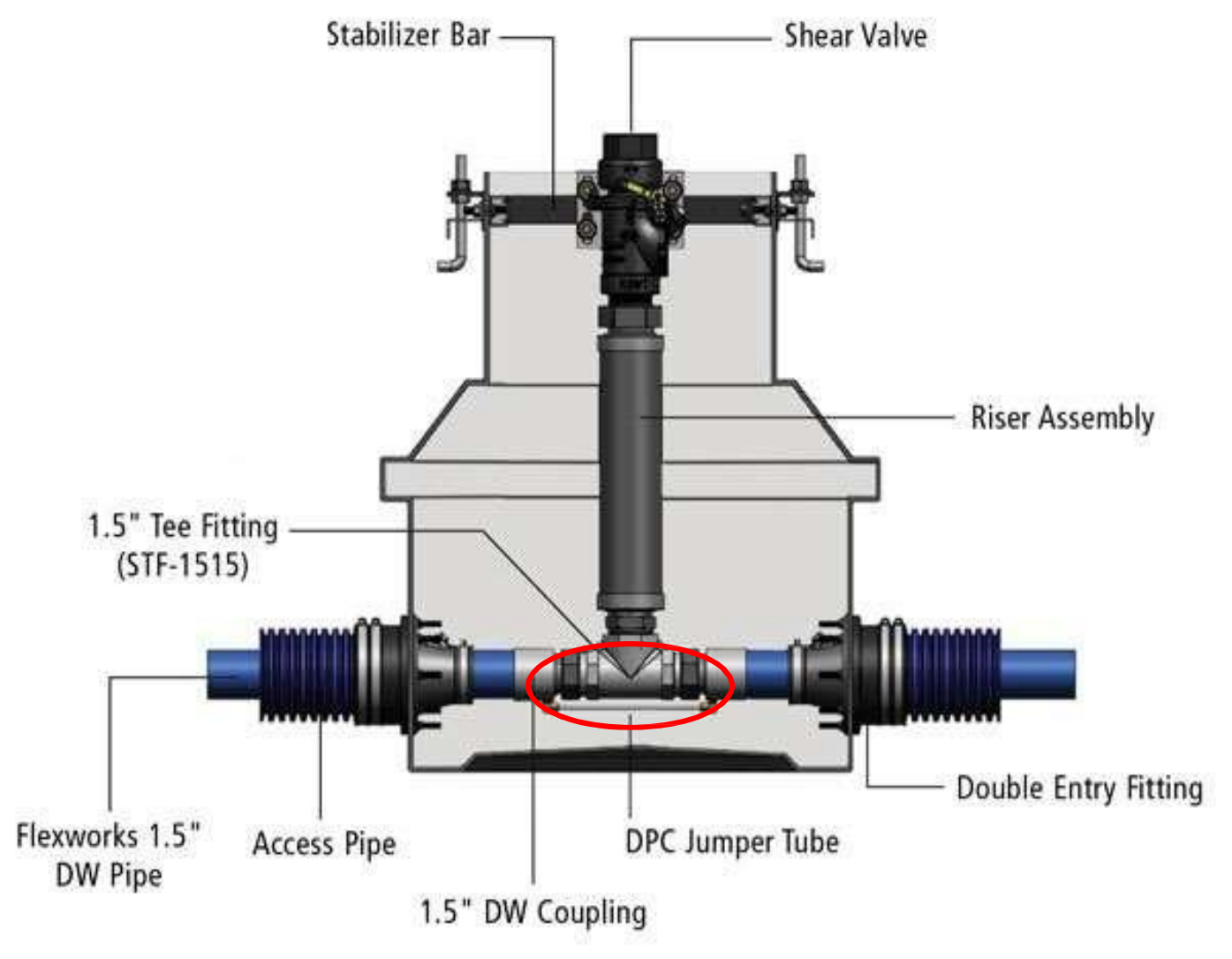
- What has to be tested?
  - Containment sumps used for interstitial monitoring ofpiping

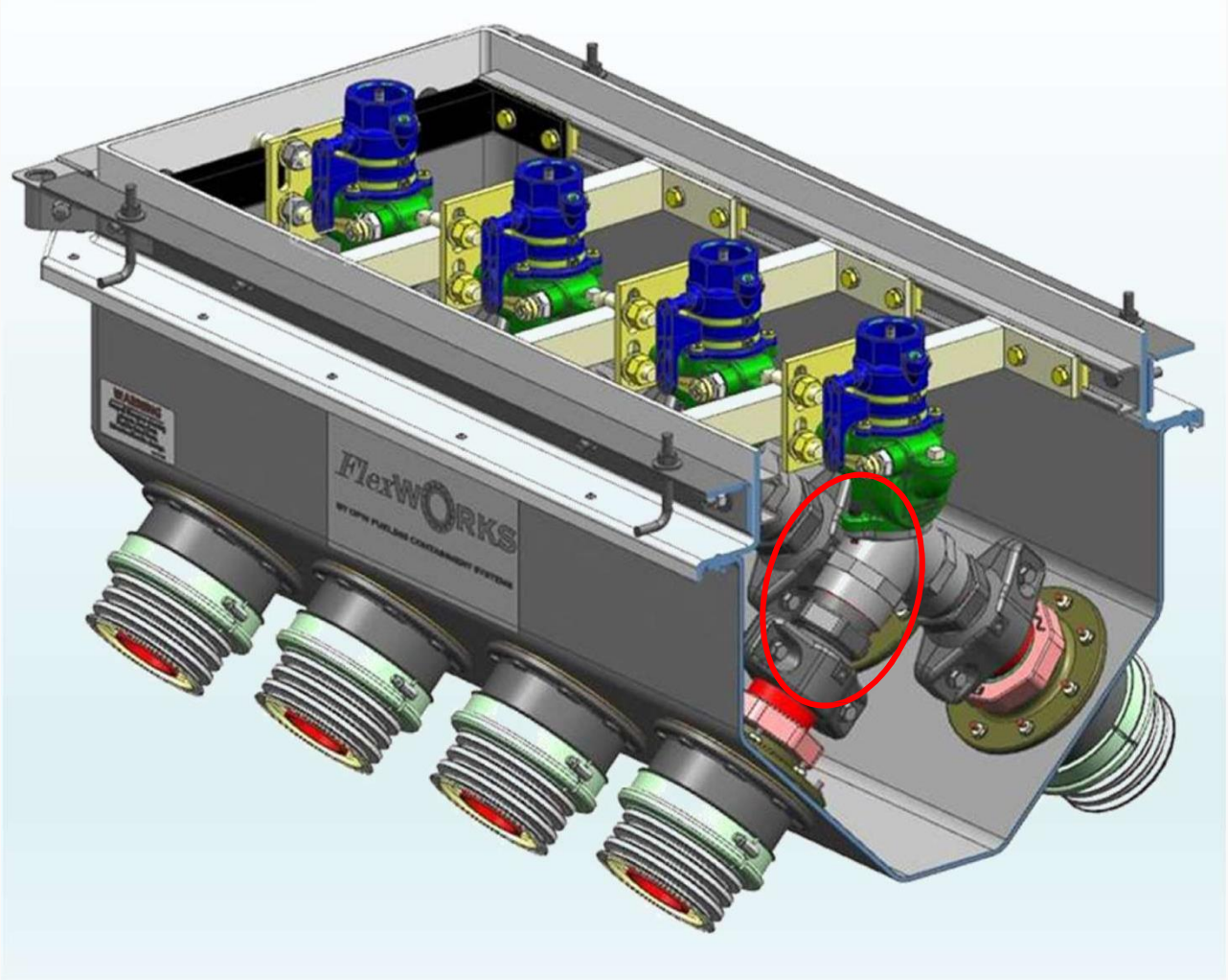
# Containment Sumps

- What has to be tested?
  - Containment sumps used for interstitial monitoring of piping
- What does not have to be tested?
  - Containment sumps not used for interstitial monitoring of piping
    - O/O's of DW piping systems installed before secondary containment requirement not required to use interstitial monitoring
    - UDCs when not used for interstitial monitoring of piping (required for new/replaced dispenser regardless of RD method)
  - Double-wall containment sumps where the integrity of both wall is monitored at least annually




PEI RP100 Figure 8-1


Stabilizer Bar
Shear Valve
Riser Assembly
1.5" Tee Fitting
(STF-1515)
Flexworks 1.5"
DW Pipe
Access Pipe
1.5" DW Coupling
DPC Jumper Tube
Double Entry Fitting


FlexWORKS

# Testing of Spill Buckets and Containment Sumps

Testing of spill buckets and containment sumps must be accomplished in accordance with

(A) Requirements developed by the manufacturer (Note: Owners and operators may use this option only if the manufacturer has developed requirements);

(B) Code of practice developed by a nationally recognized association or independent testing laboratory; or

(C) Requirements determined by the implementing agency to be no less protective of human health and the environment than the requirements listed in (A) and (B).

# Testing of Spill Buckets

Testing of spill buckets must be accomplished in accordance with

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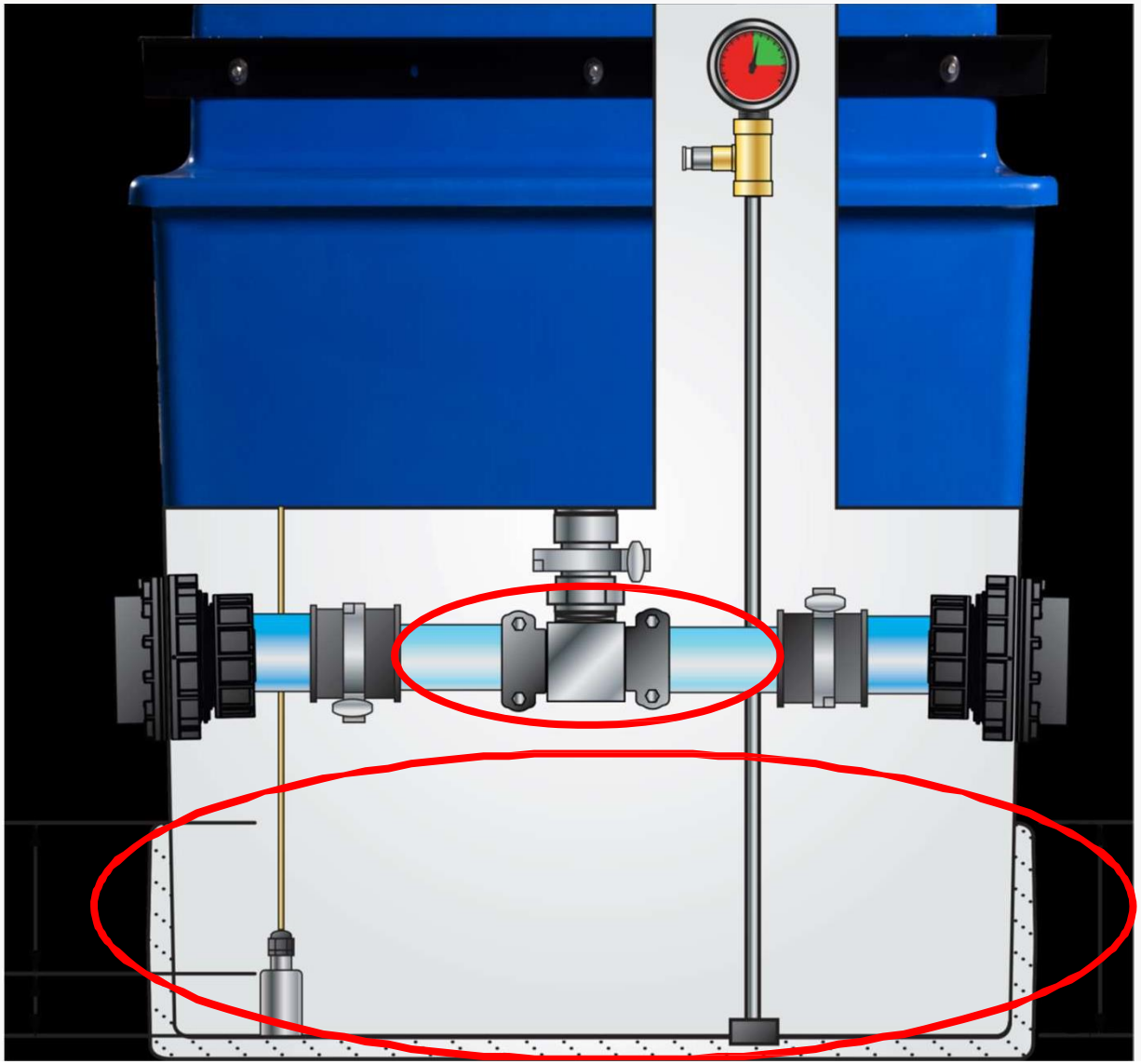
(C) Requirements determined by the implementing agency to be no less protective of human health and the environment than the requirements listed in (A) and (B).

# Testing of Containment Sumps – Requirement Developed by Manufacturer

- None identified for testing single-walled containment sumps
- Containment sump with double bottom may be tested in accordance with manufacturer instructions



# Testing of Containment Sumps – Requirements Determined by Implementing Agency To Be No Less Protective

EPA accepts:

- Low liquid-level testing
- Alternative Test Procedures meeting identified criteria

States need to determine if these are acceptable in their state

# Testing of Containment Sumps – Requirements Determined by Implementing Agency To Be No Less Protective

Low liquid-level testing

- Conditions and procedures available at: https://www.epa.gov/sites/production/files/2018-06/documents/low-level-hydrostatic-sump-testing-procedures.pdf

# Testing of Containment Sumps – Requirements Determined by Implementing Agency To Be No Less Protective

Low liquid-level testing

- Conditions and procedures available at: https://www.epa.gov/sites/production/files/2018-06/documents/low-level-hydrostatic-sump-testing-procedures.pdf
- The conditions and procedures are slightly different than the PEI RP1200 conditions and procedures.
- Owners/Operators must fully comply with one or the other, not allowed to choose portions of each procedure

# Testing of Containment Sumps – Requirements Determined by Implementing Agency To Be No Less Protective

Alternative Test Procedures criteria:

- The sump is tested for liquid tightness using vacuum, pressure, or liquid.

# Testing of Containment Sumps – Requirements Determined by Implementing Agency To Be No Less Protective

## Alternative Test Procedures criteria:

- The sump is tested for liquid tightness using vacuum, pressure, or liquid.
- Equipment and procedures for the sump test can detect a leak of 0.1 gallons per hour with a probability of detection of at least 95 percent with a probability of false alarm of no more than 5 percent.

# Testing of Containment Sumps – Requirements Determined by Implementing Agency To Be No Less Protective

Alternative Test Procedures criteria:

- The sump is tested for liquid tightness using vacuum, pressure, or liquid.
- Equipment and procedures for the sump test can detect a leak of 0.1 gallons per hour with a probability of detection of at least 95 percent with a probability of false alarm of no more than 5 percent.
- The test method has been evaluated by qualified, independent party using an applicable test procedure developed by EPA, and the test procedure is appropriate for the type of release detection technology being evaluated.

# Testing of Containment Sumps – Requirements Determined by Implementing Agency To Be No Less Protective

## Alternative Test Procedures criteria: (continued)

- To demonstrate their sump test meets the above criteria, manufacturers may request the National Work Group on Leak Detection Evaluation (NWGLDE) review their evaluation. NWGLDE lists those sump tests that meet the criteria under Secondary and Spill Containment Test Methods at nwglde.org/methods/sec_spill_cont.html.

NWGLDE

National Work Group On Leak Detection Evaluations

Search NWGLDE.org GO

Secondary and Spill Containment

Revision Date: July 3, 2019

## *Secondary and Spill Containment Test Methods*

**Click on the vendors specific EQUIPMENT NAME to go to that Listing.**

| VENDOR | EQUIPMENT NAME | LEAK RATE/THRESHOLD/ MAX TANK CAPACITY |
|---|---|---|
| **AC'CENT Environmental** | Dri-Sump Containment Tightness Test Method | 0.1 gph with PD = 100%, and PFA = 0% |
| **Franklin Fueling Systems** | Incon TS-STS Sump Test System | 0.00192 inch in 15 minutes with PD=95%/0.0080 inch/hr |
| **Fueling and Service Technologies, Inc.** | Hydro-Tite™ Leak Detection System For Secondary Containment | 0.00065 inch in 12 minutes with PD = 95%/0.010 inch/hour |
| **Leak Detection Technologies, LLC** | DPleak Differential Pressure Leak Test – Leak Detection and Leak Location Test Method | 0.1 gph with PD = 100%, and PFA = 0%.<br>0.005 gph with PD = 96%, and PFA = 0% |
| | MCleak Enhanced Interstice Test for Doubled-Walled Tanks, UDCs, Sumps and Spill Buckets | Leak Rate – 0.005 gph w/ 72 hour wait before testing/1,500 interstitial capacity.<br>Leak Threshold – 0.0017 gph |

# Testing of Containment Sumps – Code of Practice

Code of Practice meeting regulatory requirement:

- PEI RP 1200 Testing of UST Spill, Overfill, Leak Detection and Secondary Containment (2019 Edition)

# Testing of Containment Sumps – Code of Practice

Code of Practice meeting regulatory requirement:

- –PEI RP 1200 Testing of UST Spill, Overfill, Leak Detection and Secondary Containment (2019 Edition)

Code of Practice NOT meeting regulatory requirement:

- –ASTM E3225-20 Standard Practice for Performing a Liquid Test of Spill Prevention Equipment and Containment Sumps Used for Interstitial Monitoring of Piping by Visual Examination

# Recordkeeping

Owners and operators must maintain records for spill prevention equipment and containment sumps used for interstitial monitoring of piping:

(1) All records of testing must be maintained for three years.

PEI RP1200 and EPA Low Liquid Level tests have forms to document test results

(2) For equipment not tested every three years, documentation showing that the prevention equipment is double walled and the integrity of both walls is periodically monitored must be maintained for as long as the equipment is periodically monitored.

# Sump Repair

- Repairs to UST systems must be properly conducted in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory

# Sump Repair

- Repairs to UST systems must be properly conducted in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory
- Repairs must be compatible with substance stored.  Records required if storing more than E10 or B20.

# Questions?

# UST Testing Licensing Requirements by State (not inclusive of all states) and PEI RP 1200-19 Update

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COMPLIANCE WITHOUT COMPROMISE™


Edward S. Kubinsky Jr.
Director of Regulatory Affairs, Training and Certification
CROMPCO, LLC
Office: (610) 276-5914
Cell: (610) 633-9732
ed.kubinsky@crompco.com

**NEWIPCC Webinar 04/30/2020**

# State Licensing to Perform UST Testing Activities (NOTE: this list is not inclusive of all states and in no particular order) PA

- Must demonstrate current and valid equipment manufacturer's certification in order to apply to DEP (no cost to apply)
- Must take and pass 2 exams; fee per exam (1 exam technical, 1 exam on PA DEP rules & regs)
- Certification is valid for 3 years
- Must maintain equipment manufacturer's certification (UTT category)
- Must attend 4-hour DEP Administrative training (CE) once every 3 years (all categories of certification)
- Must attend category-specific DEP-approved training (CE) once every 3 years (UTT/UMX/UMI/IUM)
- Must re-apply to renew (no cost)

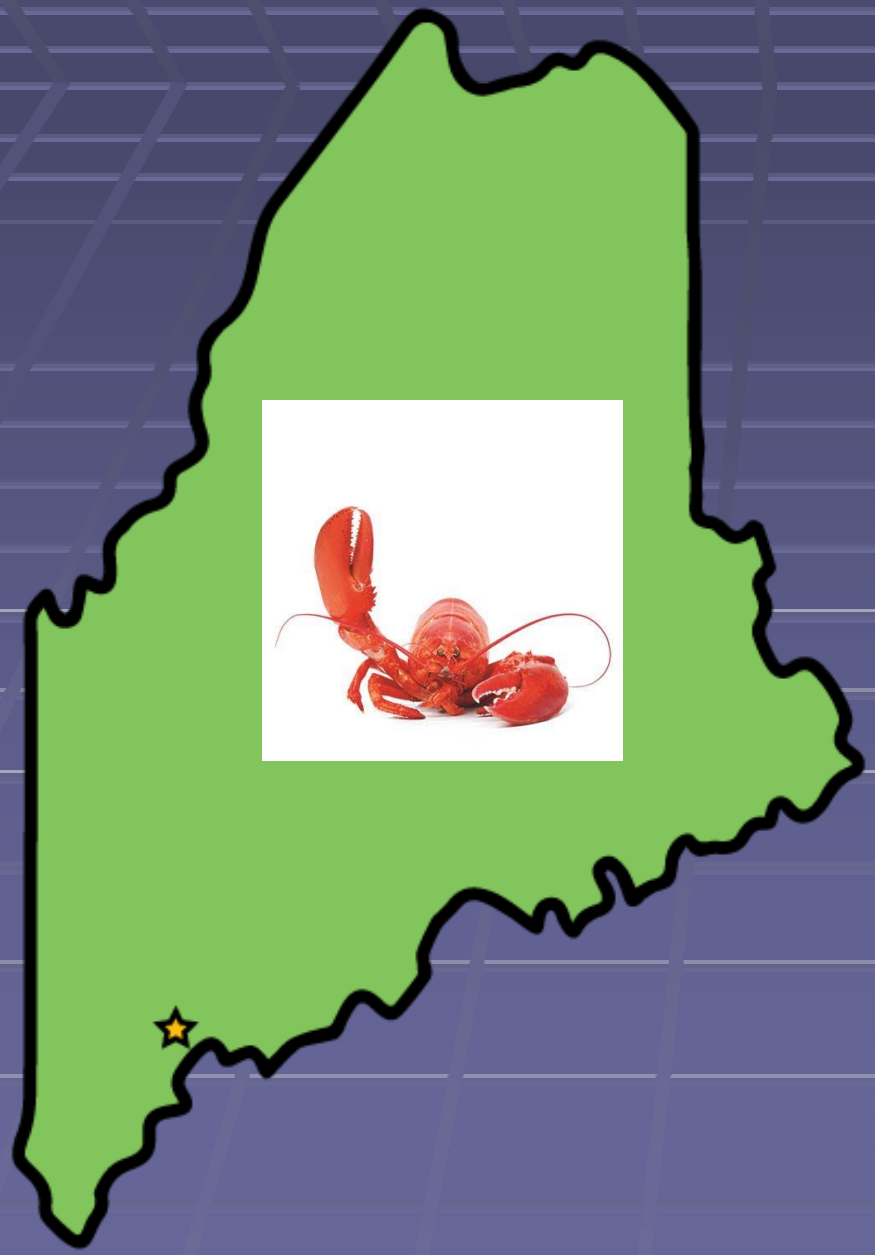
# PA DEP-Categories of Contractor Certifications Required for “New Equipment Testing”

- IUM: UST Compliance Inspector (can perform all new testing except overfill testing)
- UTT: Underground Tank/Line Tightness Testing (can perform all new testing except overfill testing and this category is required to perform tank/line tightness testing activities)
- UMX: Underground Tank Installer (can perform all new testing but not tank/line tightness testing)
- UMI: Underground Tank Minor Modifications (can perform all new testing but not tank/line tightness testing) – think of this as “UMX Jr.” certification where repairs can be done as long as it doesn’t require excavation

# State Licensing to Perform UST Testing Activities Continued…RI


- Must apply for license as a tester annually (both company and individual)
- No exam, no CE required
- Pay a fee per individual and company
- Document current equipment manufacturer's certification
- Document proper liability insurance

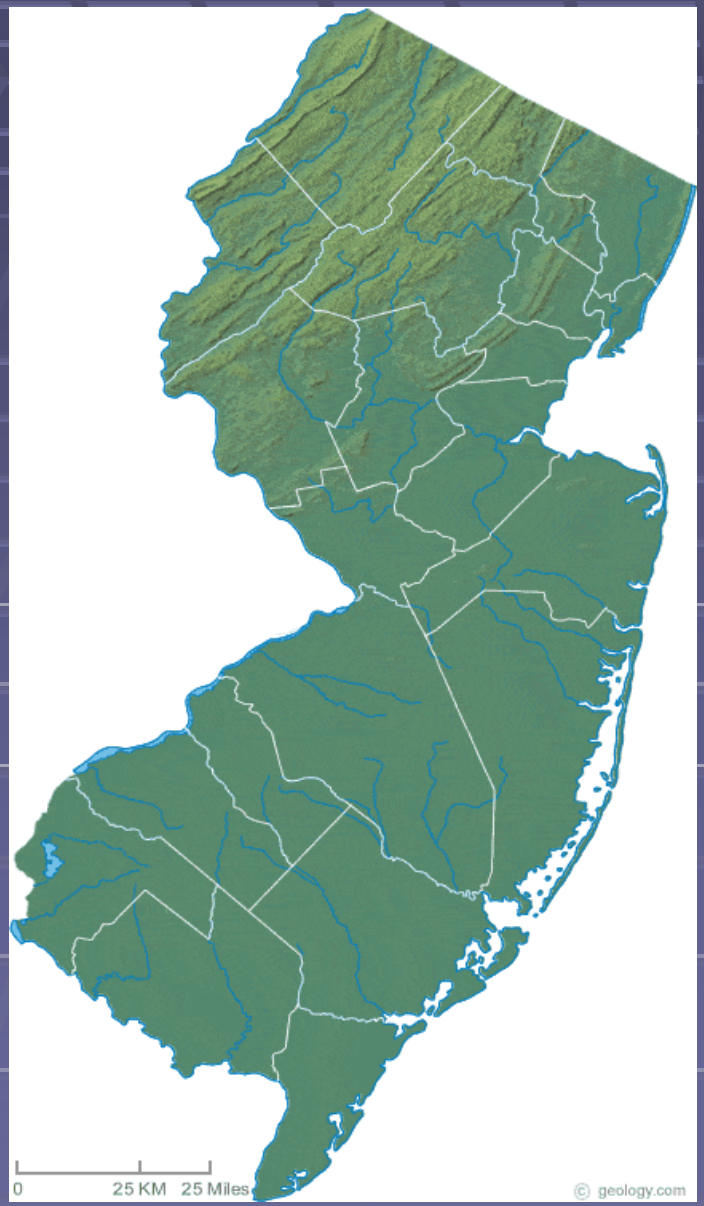
# State Licensing to Perform UST Testing Activities Continued…ME



- Must apply for installer or inspector certification (application fee)
- Must take and pass a rigorous exam (exam fee)
- Certification is valid for 2 years
- Must take 8-hours of board-approved CE (annual class hosted by DEP is 8-hours and approved for 4-hours of CE or other DEP-approved CE can be used)
- Must re-apply and pay fee
- All UST testing in ME must be conducted by or overseen by a certified tank installer or inspector

(Personal note: excellent annual CE class put together by DEP)

# State Licensing to Perform UST Testing Activities Continued…NJ




- Must take and pass ICC U-3 exam (exam fee; take the exam only once)
- Must apply and document experience and equipment manufacturer certification (application fee)
- Must take an 8-hour NJ DEP-approved CE course every 3 years for a fee (Rutgers, Montclair State, PECA)
- Must pay renewal fee invoice from NJ DEP every 3 years
- Certified installers and certified testers may perform all new testing

# State Licensing to Perform UST Testing Activities Continued…WV

- Must apply and take an exam to be either Class C for tightness testing or Class F Repair Technician (fee required)
- Certification is valid for 3 years
- Must renew by applying and taking 16 hours of WV DEP-approved CE (fee required) or retake exam

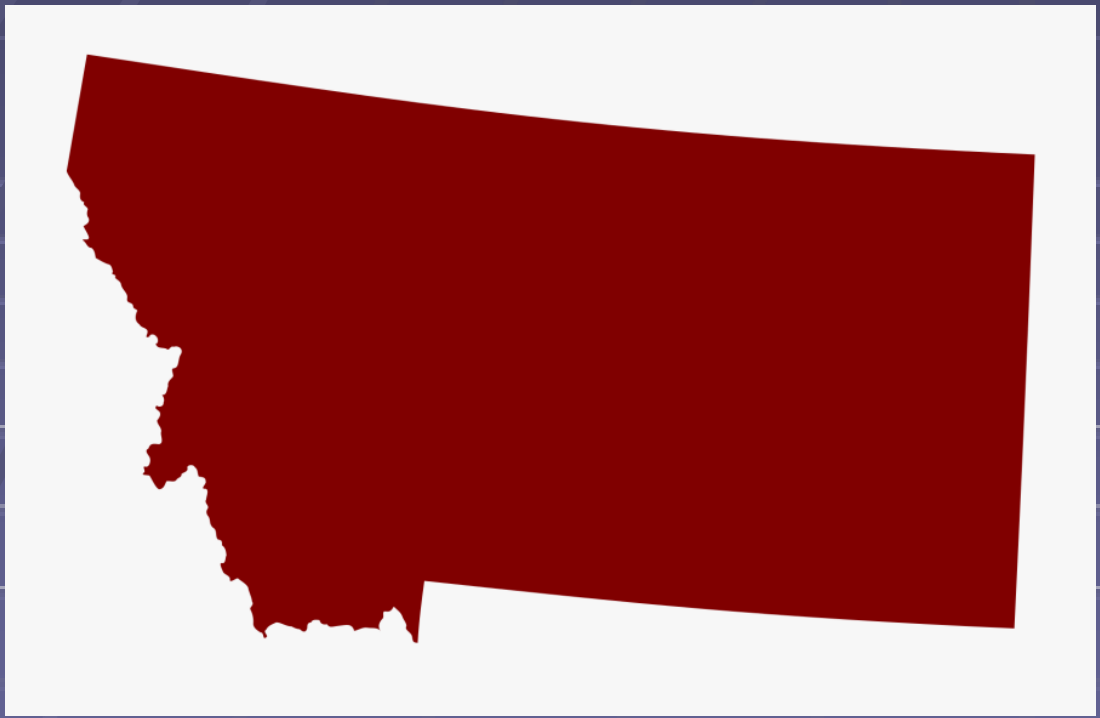
# State Licensing to Perform UST Testing Activities Continued…FL


- Must apply with FL Department of Business and Professional Regulation (fee required)
  - Requires personal credit check
  - Requires fingerprinting
- Must renew by taking 16 hours of CE every 2 years which can be face-to-face or online (fee required) – CE has absolutely nothing to do with UST work
- Must renew every 2 years (fee required)

# State Licensing to Perform UST Testing Activities Continued…WY


- Must take and pass ICC W-5 Tightness Tester exam for initial licensing and then re-take every 5 years thereafter
- Once certified, individual must apply for a license which is valid for 5 years

# State Licensing to Perform UST Testing Activities Continued…MT



- Testers must be licensed
- Licensees must get 16 hours of CE every 3 years and must attend at least 1 licensee training classes every 3 years
- Licensees must obtain a permit for repairs

# State Licensing to Perform UST Testing Activities Continued…CO

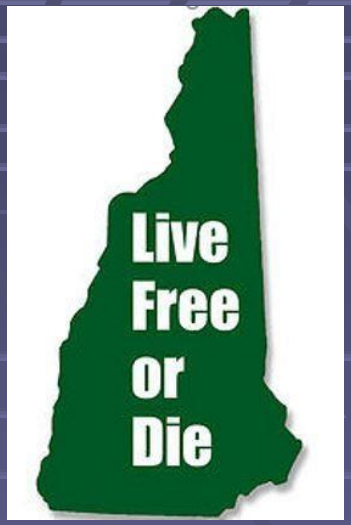

- Testers must have QST (Qualified Service Technician) certification. Must have PEI Certification by passing the Service Technician Training Manual Level 1 and PEI RP 900 tests.
- QST certification is good for 2 years

# State Licensing to Perform UST Testing Activities Continued…UT

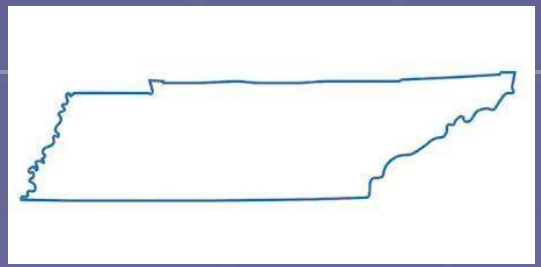

- Testers are required to be certified
- Must take and pass a state-administered exam
- Certification is valid for 2 years and recertification is done by re-testing
- Owners may perform their own hydrostatic tests but must follow PEI RP 1200 and take photos

# State Licensing: some states have no requirements for licensing/registration as a tester except MFG certification



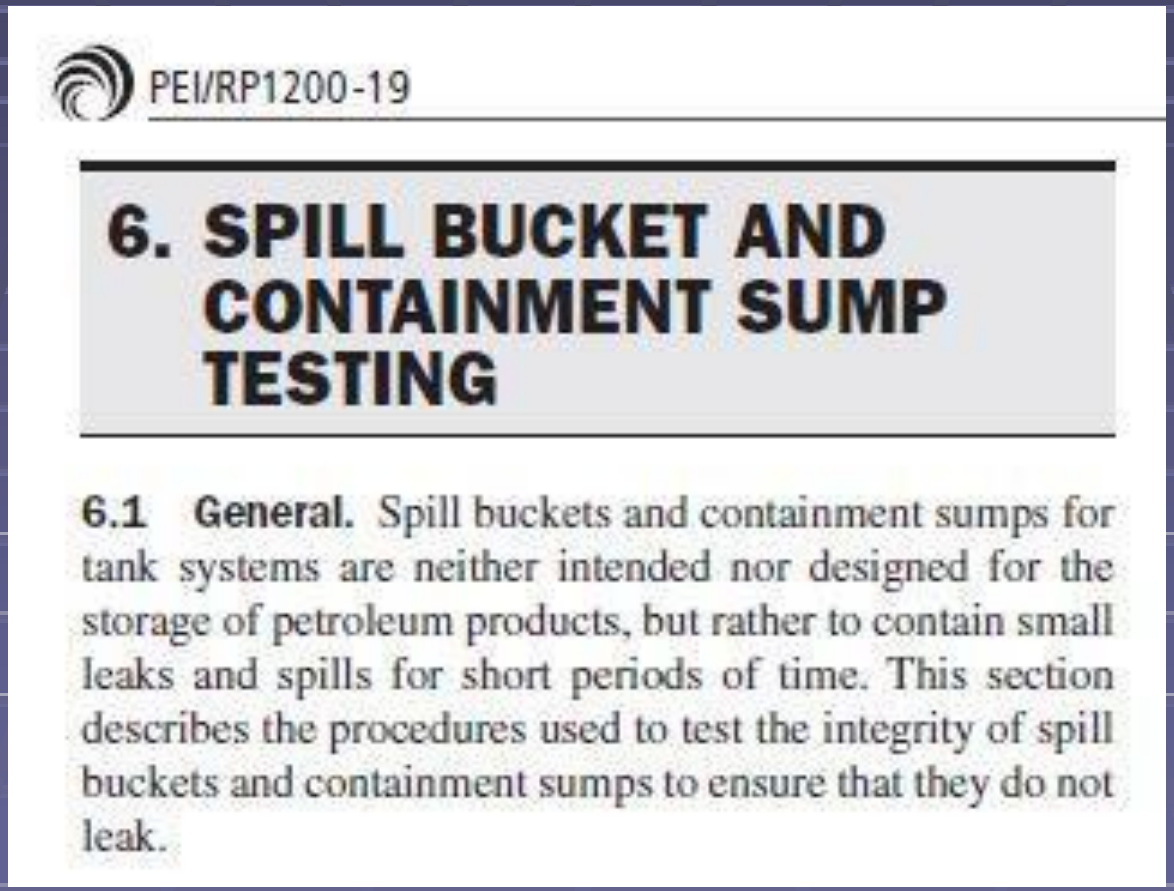





# PEI RP 1200-19 Spill Bucket Testing

# Chapter 6 Covers Spill Bucket and Containment Sump Testing



PEI/RP1200-19

## 6. SPILL BUCKET AND CONTAINMENT SUMP TESTING

**6.1 General.** Spill buckets and containment sumps for tank systems are neither intended nor designed for the storage of petroleum products, but rather to contain small leaks and spills for short periods of time. This section describes the procedures used to test the integrity of spill buckets and containment sumps to ensure that they do not leak.

Note 1: No matter which method (hydrostatic or vacuum) is being used for spill bucket testing, the buckets must be visually inspected prior to testing (PEI RP 1200 Preparation 6.2.4 & 6.3.4).
Note 2: Owners may choose an industry code of practice (PEI RP 1200), manufacturer's test procedures or procedures approved by the AHJ.

# 6.2 Covers Hydrostatic Testing

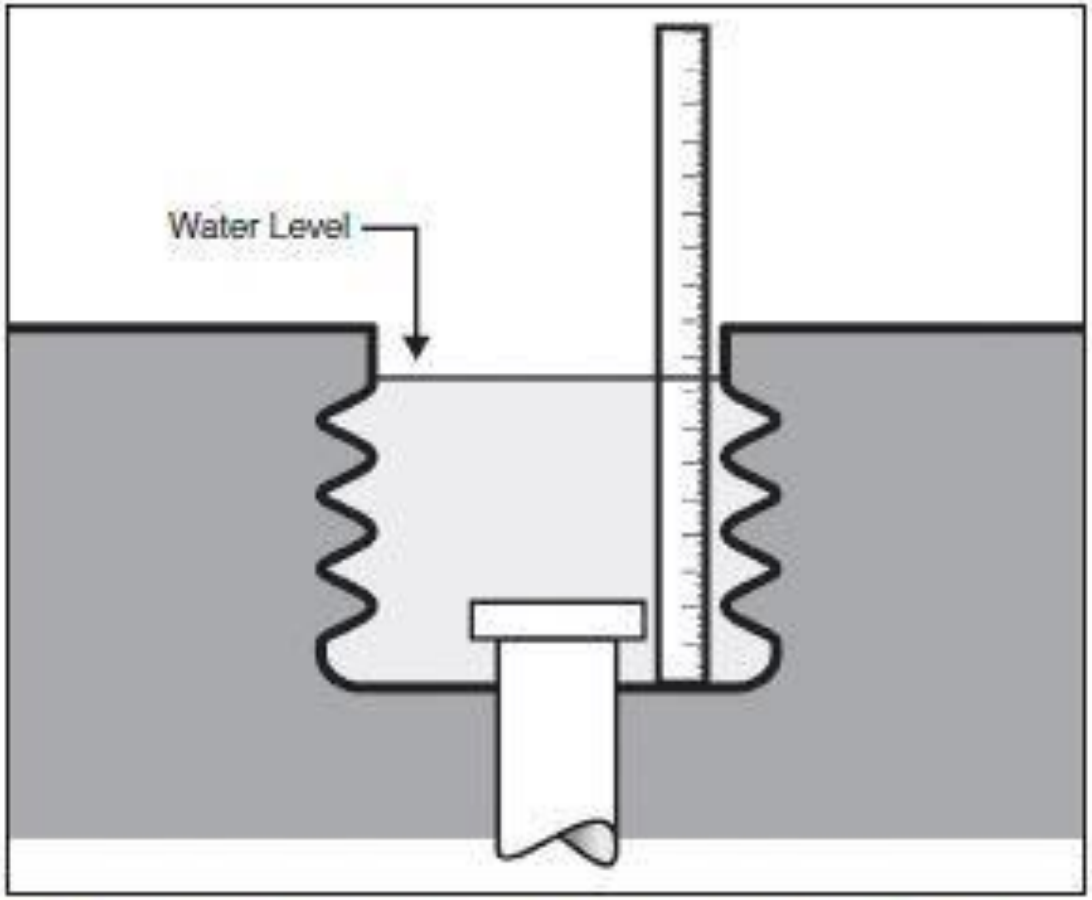



**FIGURE 6-1.** *The hydrostatic method of determining spill bucket integrity uses water to detect leaks. The measuring stick must be placed in the same location at the beginning and end of the test period to ensure accurate water level readings.*

# 6.2 Covers Hydrostatic Testing

- Must fill the spill bucket to within 1.5” of the top of the bucket
- Take initial measurement of the liquid level (best done from the bottom up)
- Wait a minimum of 1 hour
- Take final measurement of the liquid level
- If the liquid level drops 1/8” or more, the spill bucket fails the test

# 6.3 Covers Vacuum Testing Single-Wall Spill Buckets or the Primary of a Double-Wall Bucket

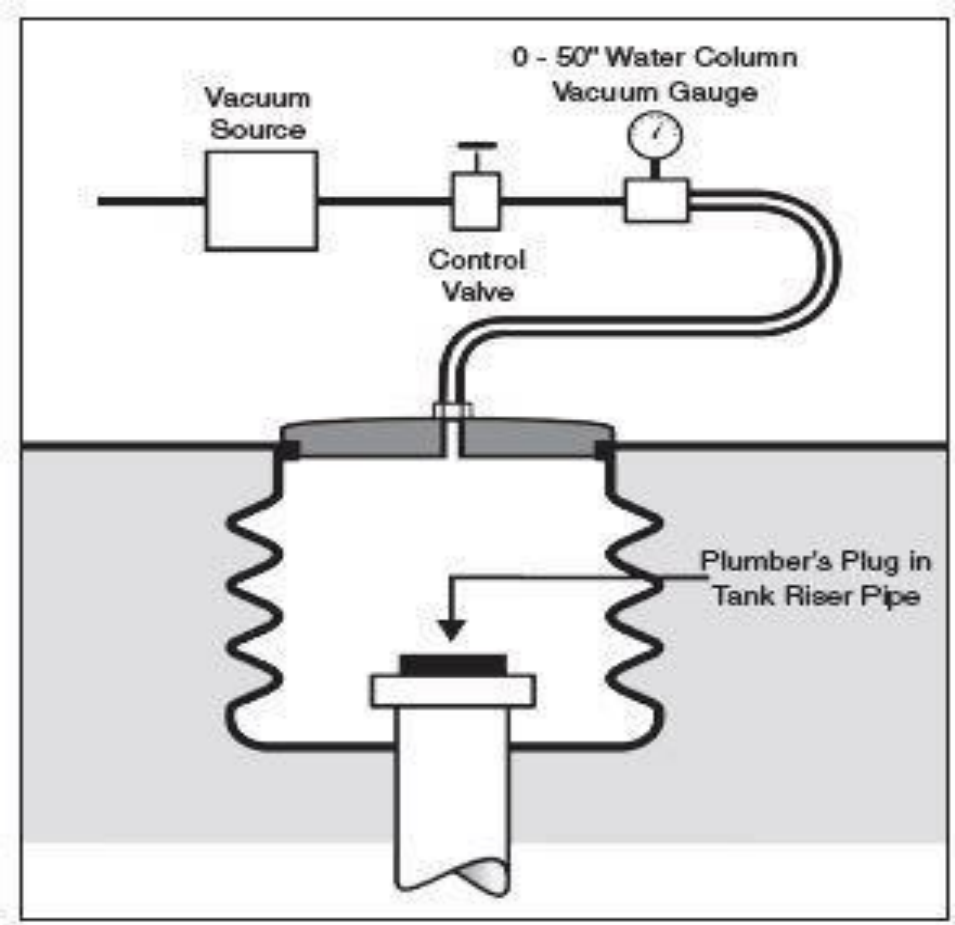



**FIGURE 6-2.** *The cover must make a tight seal with the spill bucket to prevent leakage when the vacuum is pulled during the test.*

# 6.3 Covers Vacuum Testing Single-Wall Spill Buckets or the Primary of a Double-Wall Bucket

- Seal off the bucket from the tank and pull 30” water column vacuum
- Wait a minimum of one minute
- If the ending vacuum level is less than 26” water column vacuum, the spill bucket fails the test

# 6.4 Covers Vacuum Testing The Interstitial Space of a Double-Wall Spill Bucket

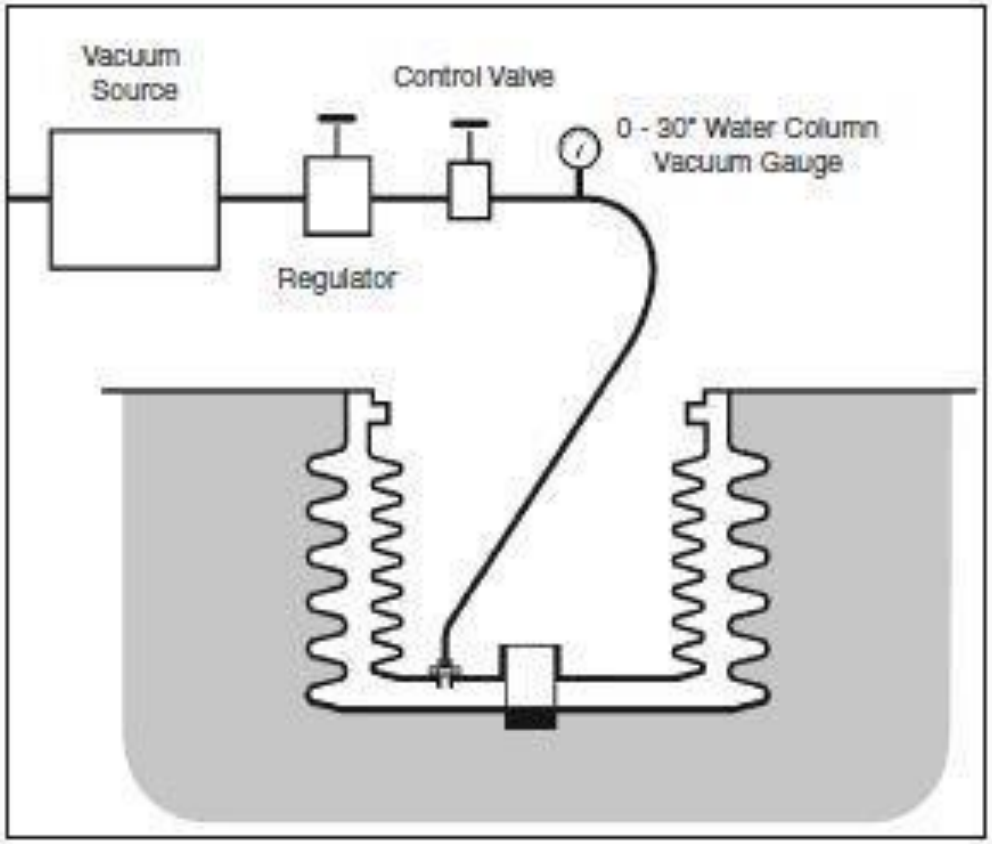
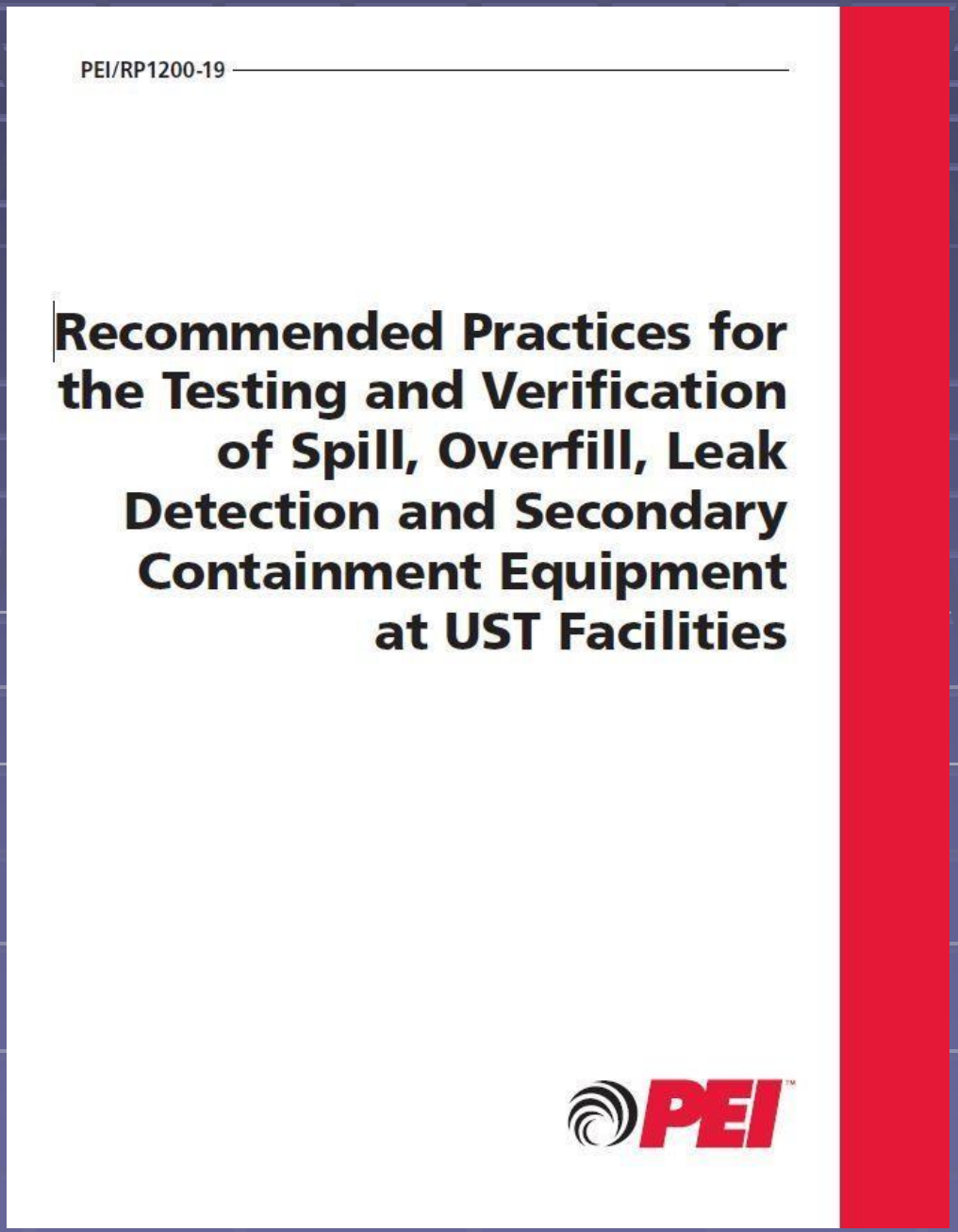



**FIGURE 6-4.** *Check lines and connections to ensure that they are leak-tight before starting the test.*

# 6.4 Covers Vacuum Testing The Interstitial Space of a Double-Wall Spill Bucket

- Attach vacuum producing device and water column gauge to the interstitial space port and pull 15” water column vacuum
- Wait a minimum of one minute
- If the ending vacuum level is less than 12” water column, the spill bucket fails the test

# PEI RP 1200-19 What's New



# PEI RP 1200-19 What's New



## FOREWORD

These *Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment* at UST Facilities have been prepared as an industry service by the Petroleum Equipment Institute. The text represents the consensus views of the PEI Overfill, Release Detection and Release Prevention Equipment Testing Committee, comprised of the following members:

**Edward S. Kubinsky, Jr., Chairman**
CROMPCO, LLC
Plymouth Meeting, Pennsylvania

**Danny Brevard**
Accent Environmental Services Inc.
Lufkin, Texas

**Jim Brown**
Belshire Environmental Services, Inc.
Foothill Ranch, California

**Todd Darrough**
Quick Trip
Tulsa, Oklahoma

**Brian Derge**
Tanknology
Austin, Texas

**Bruce Garrett**
Volta Oil Co.
Plymouth, Massachusetts

**Ryan Haerer**
U.S. EPA
Washington, D.C.

**Brian Harmon**
Tait Environmental Services, Inc.
Santa Ana, California

**Kevin Henderson**
Kevin Henderson Consulting LLC
Brandon, Mississippi

**Jim Howard**
Speedway LLC
Edison, New Jersey

**Ron Kingsbury**
UST Services Corporation
Owings, Maryland

**Brian Weigert**
R & A Risk Professionals
Des Moines, Iowa

**ed.kubinsky** 2:50 AM Reply

Russ Brauksieck did most of the heavy lifting...

Add a reply...

# PEI RP 1200-19 What's New

# PEI RP 1200-19 What's New

## 6.6 Low Liquid Level Containment Sump Testing.

**6.6.1 General.** Containment sumps are liquid-tight structures designed to temporarily contain leaks or spills. In addition, containment sumps often serve as the leak detection monitoring location for double-walled piping systems. Leakage from the primary piping typically flows inside the secondary containment piping to the sump, where it can be observed or detected. This section describes a low liquid level hydrostatic test method that actuates an electronic sensor or mechanical float device for positive shutdown of product flow or positive shutdown of a dispensing device.

# PEI RP 1200-19 What's New



- Low liquid level hydrostatic sump testing does not assess the integrity of the entire containment sump but, instead, tests only the integrity of the lower portion of the containment sump and the ability of the liquid sensor or mechanical float device to shut down any submersible turbine pumps (STPs) or dispensing devices associated with that sump.
- Disabling the operation of a dispenser may not stop a leak because the STP is still operational and the piping is pressurized.
- Under no circumstances should the low liquid level hydrostatic sump testing protocol be employed for testing of newly installed containment sumps or for initial testing of containment sumps that have been repaired. Subsequent periodic testing may be performed using the low liquid level test method.

# PEI RP 1200-19 What's New

**6.6.2 Purpose.** This section describes the preparation and procedures to perform a low liquid level hydrostatic containment sump test.

**6.6.2.1 Requirements for Test.**

**1.** A containment sump must have;

A) liquid sensors configured to shut down any STPs upon activation of the sensor; or

B) stand-alone sensors that shut down a dispensing device, or mechanical float devices that shut down product flow at the shear valve.

---

**NOTE:** For option B the facility must always be staffed when the dispensers are operational. See Section 6.6.5 (6).

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# PEI RP 1200-19 What's New

4. If the containment sump is found to have cracks, loose parts or separation of any joints or penetration fittings, it is not considered liquid-tight. This is a visual indicator of a test failure.

5. Test boots or secondary containment termination fittings must be present on the piping that penetrates the sump if the penetration will be within the liquid level of the test.

6. An electronic sensor or UDC mechanical float device must be installed in all UDC and STP containment sumps.

   - If the sensor is electronic, determine if it is stand-alone or connected to an electronic monitoring system (EMS), such as an automatic tank gauge (ATG).
   - If the sensor is stand-alone, verify that it will shut down devices (dispenser or STP) associated with that sensor.
   - If the sensor is connected to an EMS, verify that it will shut down all STPs associated with that sensor.
   - If the sensor is a UDC mechanical float device, verify that there is a float connected to each shear valve in the UDC.

# PEI RP 1200-19 What's New

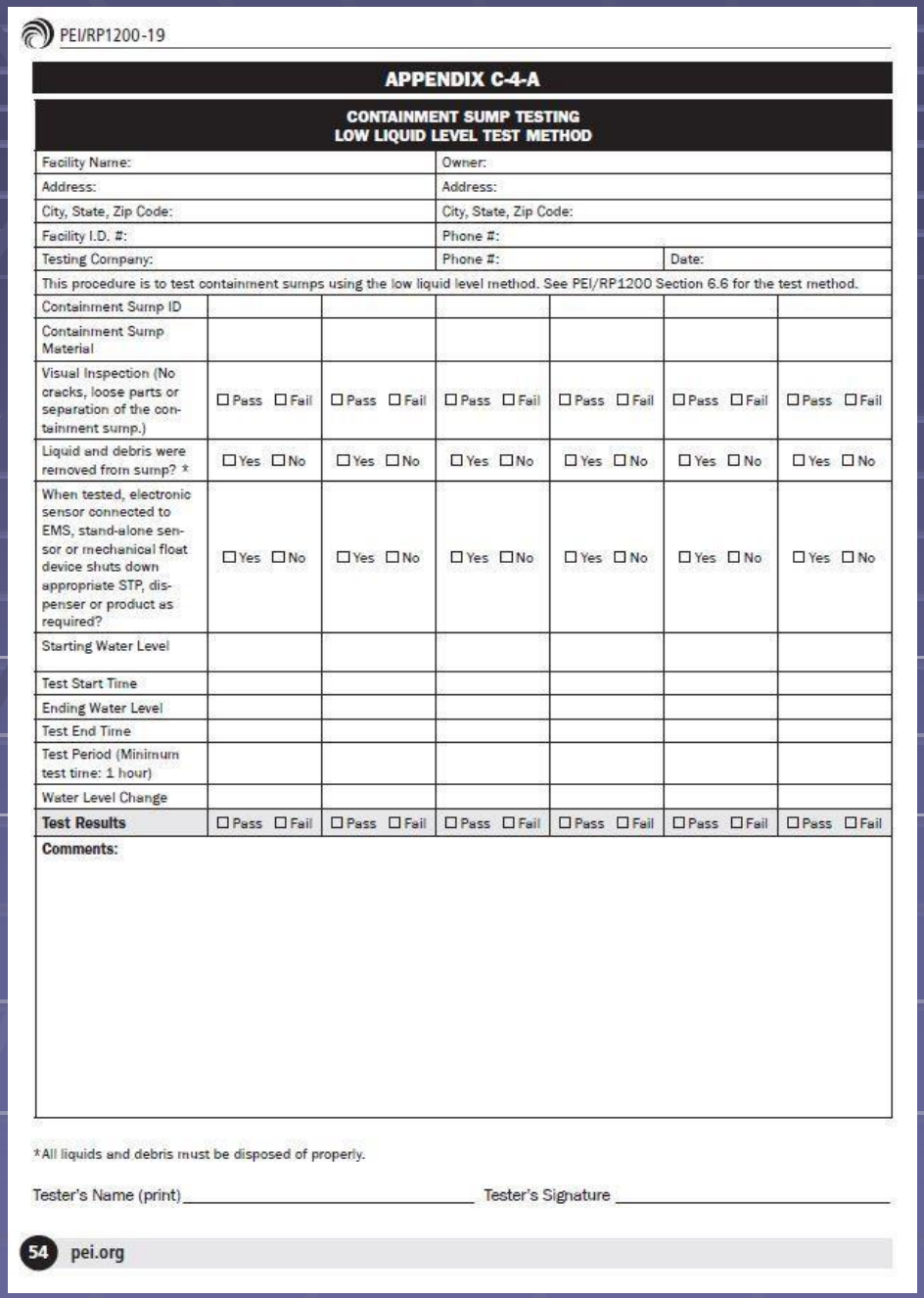
7. Add water to the containment sump a minimum of 4 inches above the sensor activation point. To compensate for sump deflection, the water must be allowed to settle a minimum of 15 minutes before taking the initial test measurement.

# PEI RP 1200-19 What's New

**6.6.7 Pass/Fail Criteria.**

- Containment sumps must pass both the sensor portion and hydrostatic portion to pass the low liquid level test protocol.
- If the electronic liquid sensor connected to an EMS does not activate at the appropriate level (typically 1-inch liquid level) and shut down all STPs associated with that sensor, the low liquid level test fails.
- If the stand-alone electronic liquid sensor connected to a device (dispenser or STP) does not activate at the appropriate level (typically 1-inch liquid level) and shut down the device (dispenser or STP) associated with that sensor, the low liquid level test fails.
- If a mechanical float device does not activate at the appropriate level (typically 1-inch liquid level), trip the associated shear valve(s) and shut down product flow to the dispenser, the low liquid level test fails.
- If the water level changes less than 1/8 (0.125) inch, the containment sump passes the hydrostatic portion of the test. If the water level changes 1/8 (0.125) inch or greater, the containment sump fails the hydrostatic portion of the test.

# PEI RP 1200-19 What's New



PEI/RP1200-19

**APPENDIX C-4-A**

**CONTAINMENT SUMP TESTING**
**LOW LIQUID LEVEL TEST METHOD**

| | | | | | | |
|---|---|---|---|---|---|---|
| Facility Name: | | | Owner: | | | |
| Address: | | | Address: | | | |
| City, State, Zip Code: | | | City, State, Zip Code: | | | |
| Facility I.D. #: | | | Phone #: | | | |
| Testing Company: | | | Phone #: | | Date: | |
| This procedure is to test containment sumps using the low liquid level method. See PEI/RP1200 Section 6.6 for the test method. | | | | | | |
| Containment Sump ID | | | | | | |
| Containment Sump Material | | | | | | |
| Visual Inspection (No cracks, loose parts or separation of the containment sump.) | ☐ Pass ☐ Fail | ☐ Pass ☐ Fail | ☐ Pass ☐ Fail | ☐ Pass ☐ Fail | ☐ Pass ☐ Fail | ☐ Pass ☐ Fail |
| Liquid and debris were removed from sump? * | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |
| When tested, electronic sensor connected to EMS, stand-alone sensor or mechanical float device shuts down appropriate STP, dispenser or product as required? | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |
| Starting Water Level | | | | | | |
| Test Start Time | | | | | | |
| Ending Water Level | | | | | | |
| Test End Time | | | | | | |
| Test Period (Minimum test time: 1 hour) | | | | | | |
| Water Level Change | | | | | | |
| **Test Results** | ☐ Pass ☐ Fail | ☐ Pass ☐ Fail | ☐ Pass ☐ Fail | ☐ Pass ☐ Fail | ☐ Pass ☐ Fail | ☐ Pass ☐ Fail |

**Comments:**

*All liquids and debris must be disposed of properly.

Tester's Name (print) _____ Tester's Signature _____



Sample test forms can be downloaded for free at: https://www.pei.org/rp1200

# Repairs to Sumps

# Repairs to Sumps

# Repairs to Sumps

# Repairs to Sumps

# Thank You & Please Be Safe!!

# UL 2447 & COMPRENHENSIVE SUMP COMPATIBILITY

## April 2020 NEIWPCC Webinar

**What is Compatibility?**

- UL's Comprehensive Testing Approach
- Individual Materials *and* Sump System
- Test Fuels/Fluids and Fuel Blend Ratings
- Expected Use Conditions & Environments
- Test Samples Matter!

**Focus on Repairs & Replacement Parts**

- Sump Repair Kits
- Repair & Replacement Fittings

**Common Misperceptions About Compatibility**

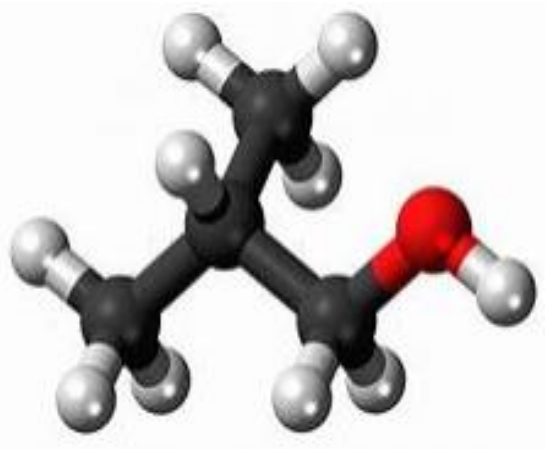
- Not All Generic Materials Are The Same
- Sump Component Cross-Compatibility…And More

**Practical Application of Compatibility & Risk Mitigation**

- Old vs New Sump Systems
- Improved LDS & Inspection Regs

# WHAT IS COMPATIBILITY?

**There are many definitions** of this concept as related to UST Fueling Systems, of which different evaluation protocols are used to make a compatibility claim against it.




**But ultimately, it's up to** the Owner/Operator to accept the risk of the compatibility claim, and you as Regulators to approve of it per your State Regulations.

**And, different interpretations** may be applied to a new sump product from the factory vs inspection/maintenance/repair of that sump after initial installation.

**The new 2015 EPA UST Regulations** permits 3 paths to demonstrate compatibility

**for new OEM sump products…**

A NRTL product Listing, OEM written statement, or alternate equivalent acceptable to the AHJ.
**But what kinds of compatibility are covered?** Only Fuel, and under what conditions?
What about other "compatibility" considerations that also lead to leakage? **More on this later…**

## Compatibility

- **Notification** - Owners and operators must **notify** the implementing agency at least 30 days before switching to a regulated substance containing greater than 10 percent ethanol, 20 percent biodiesel, or any other regulated substance identified by the implementing agency
- **Demonstration of compatibility** – Owners and operators must
  - **demonstrate** compatibility of the UST system through a nationally recognized testing lab listing or manufacturer approval of UST equipment or components, or
  - **use an alternative option** identified by the implementing agency that is no less protective than demonstrating compatibility of the UST system
- **Recordkeeping** - Owners and operators must **maintain records** for as long as the biofuel blend is stored to demonstrate compliance

6

## Examples for Demonstrating Compatibility

**Independent Laboratory Certification or Listing for Use with the Substance**

**Affirmative Statement of Compatibility from Manufacturer**

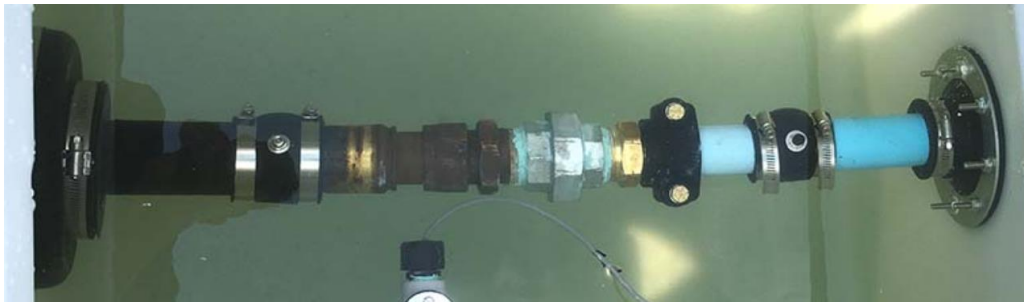
10

**We are uncertain** of the many different technical basis on which each manufacturer makes a material or product claim, but we strongly believe UL Listings to UL2447 have the highest level of independent testing to “real world” requirements developed by technical experts, and backed by collaborative science & research with National Labs.

**Others may only test materials** under limited conditions, but UL’s comprehensive evaluation philosophy tests the combination of assembled products that contains the fuel, under both expected & unexpected conditions…

Because history has shown us a large number of sump leaks are related to incompatibility of/with any number of the following:

**Sump Components** and/or assembly/joining methods, including through pipes,
**Fuels** with higher bio-blend levels that go out of spec & have degradation byproducts,
**Chemicals** in different soils & fluids, extreme temperatures, and
**Physical Stresses** of assembly and changing environments over long term use



# INDIVIDUAL MATERIAL COMPATIBILITY WON'T GUARANTEE A LEAK TIGHT SUMP…AS IT'S DEPENDANT ON THE WEEKEST SYSTEM COMPONENT, *and* WHO/HOW IT IS ASSEMBLED.

**UL2447 requires** manufacturers test their product with all connecting components per the assembly instructions. For a sump, these are typically penetration fittings, through pipes, some frames and their connection means.

**UL2447 includes** coverage options for sump repairs & replacement fittings, test/monitor fittings, lids, covers and chase pipe!

**UL2447 Listings also requires** via markings & instructions, that proper assembly as validated by successful testing, is to be conducted by qualified persons.

No other Standards or Certification program covers these critical items.


# FUEL COMPATIBILITY

**All samples tested** represent worst case material, construction & component assembly where both individual materials and complete sumps are exposed to internal fuels/vapors & external soil fluids to simulate the real world:

- **Fuels** – Fuel F and aggressive FB25a, CE25a & CE85a
  90 (Pri) days or 60 (Sec) days @ 40 C
- **Fluids** – 3 Acids, 2 Bases, Salt & Distilled, Water & Heat
  120 days @ 40 C except Air Oven @ 70 C

**Following exposures** (liquid immersion, liquid vapors both dependent on use), a visual exam is done, and

- **Sumps** with combined components in the system must remain leak tight at 5 psi, and
- **Materials** must have min 70% PP retention (tensile strength, impact resistance…).

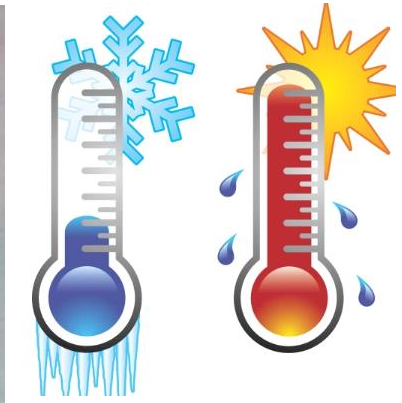

**However…**

# COMPATIBILITY of ASSEMBLY, USE/ABUSE and ENVIRONMENTS

**Before conducting the long term compatibility tests**, unacceptable damage must be simulated on the test sample, as determined by other compatibility tests.

The same samples are used for successive tests to simulate how a sump is assembled by qualified persons and used/abused in expected -30 C and +50 C environments:

- **Use/Abuse** – Drop & Impact of sump components before assembly, f/b
- **Assembly** – Torque, Bend, Push/Pull of fitting, pipes & accessories in/on sump per instructions, f/b
- **Leakage** – External & Internal Pressure to simulate soil & water loads f/b Leakage of system & lids



# TEST SAMPLE PREPARATION

**All samples shall assemble sump components per the OEM instructions,** which must include:

**Component Combinations** of sumps, fittings & pipes. Some examples…

- Generic – Any FRP or PE, or Any steel min 1/8” thick vs
- Specific – Only manufacturer X model Y, rating Z

**Connection Means** of the above components. Some examples…

- Generic – Any polyester or tarapthalic resin for FRPs, or Any 2” pipe for flanged fitting, vs
- Specific – Only manufacturer X resin Y catalyst Z for FRPs, or 20-22 inlb bolt torque for boot clamp

**Details of critical assembly procedures**, equipment, conditions, etc. Some examples…

- FRP Bonding – Surface prep, min/max temp, primers, UV cure X min…
- PE Thermo Fusing – Surface prep, TF Model X, heat setting Y, time Z…
- Flanged Fitting – Drilled hole size X, use flange ring & gasket Y, tighten to torque Z
- Repair/Replacement Fittings – Surface prep, cover placement, encapsulant injection.


# FOCUS on REPAIR & REPLACEMENT COMPONENTS

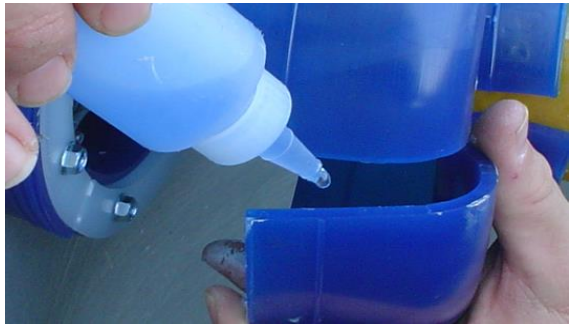

**UL2447 Permits Optional Coverage** of

**Sump wall** damage repair before/after installation, and

**Sump fittings** for repair or replacement of/over old fittings

These material and/or fitting kits must demonstrate the effectiveness of repair or replacement by qualified persons on used systems per the instructions, which must include details of which types/materials they are suitable for, surface preparation, connection means and testing.

Test samples must repair/replace applicable sump parts pre-conditioned in an equal part mixture of all test fuels for 10 days at 40°C. This validates the surface preparation methods in addition to proper bonding & sealing with the sump or pipe that may have absorbed fuels. A real world test!



# UL FUEL RATINGS based on FUEL COMPATIBILITY TESTING

## UL STANDARDS vs DISPENSED FUELS

| | Low Blend Gas E0-E10 | Mid-Range Gas E15-E50 | High Blend Gas E51-E85 | Low Blend Diesel B0-B5 | Mid-Range Diesel B6-B20 | High Blend Diesel >B20 |
|---|---|---|---|---|---|---|
| **Tanks (USTs)** | | | | | | |
| **UL58** Steel | Flam & Comb | Flam & Comb | Flam & Comb | Flam & Comb | Flam & Comb | Flam & Comb |
| **UL1746** CP Steel (PI-IV) | Flam & Comb | Flam & Comb | Flam & Comb | Flam & Comb | Flam & Comb | Flam & Comb |
| **UL1316** FRP | 2 or 3 | 3 Only | 3 Only | 1, 2 or 3 | Not Covered | Not Covered |
| **Underground Pipe** | | | | | | |
| **UL971** Nonmetallic | MV, HB or CT | Match to Blend | HB & CT | MV, HB or CT | Not Covered | Not Covered |
| **UL971A** Metallic | MV, HB or CT | Match to Blend | HB & CT | MV, HB or CT | Not Covered | Not Covered |
| **Sumps & Fittings** | | | | | | |
| **UL2447** (Old) | 2 or 3 | 3 Only | 3 Only | 1, 2 or 3 | Not Covered | Not Covered |
| **UL2447** (New) | Automotive | Automotive | Automotive | Automotive | Automotive | Not Covered |

**Old Fuel Ratings** evaluated with non-aggressive test fuels. One of the following ratings:
**Flammable & Combustible Liquids** – Includes (1) (2) (3) & other fuels or liquids with similar components and properties, or
**(1) Petroleum Products Only,**
**(2) Petroleum Products and Gasohol (Unleaded Gasoline with Max 10% Ethanol),**
**(3) Petroleum Products, Alcohols and Alcohol-Gasoline Mixtures**

**New Fuel Ratings** evaluated with new aggressive test fuels. One of the following ratings:
**(MV) = Motor Vehicle Fuels** – Gasoline w max 15% MeOH or 30% EtOH and Diesel w max 5% BioD
**(HB) = High-blend Fuels** – MV Blends + Gasoline w max 50% MeOH or 50% EtOH
**(CT) = Concentrated Fuels** – MV & HB Blends + 100% concentrations of Toluene, MeOH and EtOH
**Automotive** – Most commonly dispensed fuel blends (B0-B20, E0-E85) and includes low Iso-Butanol blends (iBu16)

# COMMON MISCONCEPTIONS and CAUTIONS

**All Generic Materials Are The Same (NO) –** Common sump materials may look the same, but their critical components, molecular structure, additives and processes give them different properties that are needed to resist fuels, chemicals, environments and forces. UL uses material analytics and physical properties to determine what tests are needed.

- **FRP –** glass type (fiber, matt), resin type (polyester, iso/terapthalic), catalyst, % mix, bonding…
- **PE –** density, melt point, tensile/impact, elongation, additives, fusion & bonding…
- **Sealant/Encapsulant –** chemical bonding to different materials, which may be contaminated….
- **Equipment & Tools –** correct settings available? tested with all different types? calibrated?

**Similar Components are Interchangeable (NO) –** Although some sump fittings have common sizes and claim to be universal, proper fit and bond/fusion/sealing especially between different generic materials may have difficulty remaining leak tight due to molecular structure and physical properties. Consider material changes due to fuel/vapor exposures, thermal expansion/contraction, etc. But UL2447 evaluates these real world issues in our comprehensive test program.

**"Meets UL2447" is the same as "UL Listed" (NO) –** Only products with a "UL Mark" are Listed to ensure they were initially tested to and continue to comply with the requirements. Claims can be made, but are they trusted? Was it done correctly to all applicable parts by a qualified company? UL is an independent NRTL with qualified technical expertise & special equipment.



# FINAL THOUGHTS on SUMPS & REPAIRS

## Practical Implementation and Improved Risk Mitigation

**There is a wide variety of sumps in use** with respect to the collection of components used in the original construction, and maybe an upgrade. When determining if a sump repair or fitting replacement is appropriate, the age, ratings, physical condition, degree of damage, local environment & compatibility claims should be considered.

* Is it rated for the combo of sump, fitting and/or pipe types to be repaired?
* Valid compatibility claim, to what standard, and is the installer qualified?


**UL2447 (2012 ed) intended to mitigate know incompatibility problems** based on leak autopsy analysis of, individual materials, system components, rough use, and the fuels, fluids & environments there used in. We expect via replacement of old systems with new ones compliant with these improved requirements, in conjunction with implementation of the 2015 EPA Regulations for improved inspections, the combined result will be greatly reduced incidents.

**Roland Riegel** – PDE Flammable Liquid Containment Products

Roland.A.Riegel@ul.com

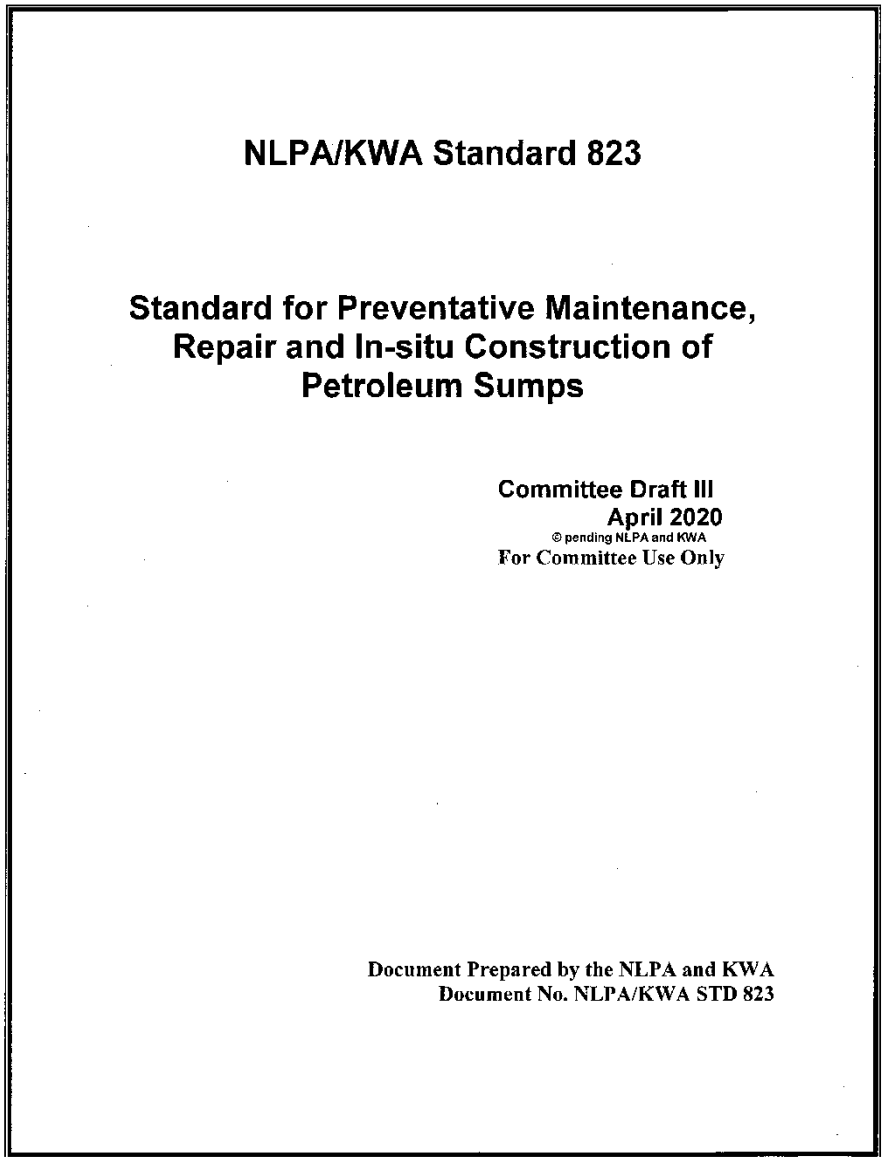

# NLPA/KWA Standard 823

NLPA/KWA 823 currently exists as a recommended practice for fiberglass sump repair and in-situ construction of new sumps using the existing sump as a mold for fabrication.

New sump repair technologies which did not exist at the time of original development have been developed.

The new standard will be performance based and incorporate the elements of the original recommended practice and the newer technologies for sump repair.

Additionally, the standard will be written in a way that allows new technologies to be used as they are developed.



NLPA/KWA Standard 823

Standard for Preventative Maintenance, Repair and In-situ Construction of Petroleum Sumps

Committee Draft III
April 2020

For Committee Use Only

Document Prepared by the NLPA and KWA
Document No. NLPA/KWA STD 823

# The Problem That Needs to Be Solved

Ich habe es drei mal geschnitten und es gibt jetz zu kurtz!

Translation: I've cut it three times and it's STILL too short!

The tank owner's lament is similar – I've had it fixed three times and it's still broken!

Caulks, glues, even Flex Seal$_{tm}$ can't fix the problem.
Standardizing the process can.

**BEFORE**

**AFTER**

# The Goals of NLPA/KWA 823

- **To provide information on the repairs available which do not require the expense or disruption of piping disconnection or breaking of concrete**
    - Fitting repair or replacement
    - Structural damage repair using structural adhesive bonders or patches
    - In-situ construction of a new sump using the existing sump as a mold for fabrication, and
    - Water-tight lid assemblies

# NLPA/KWA 823 Goals (Continued)

- To provide information on testing/certification of devices and materials used to repair sumps
    - To assure appropriateness for the intended purpose
    - To assure compatibility with the product stored
- To provide minimum testing criteria prior to returning a sump to service
- To allow for future innovations

# The current NLPA/KWA RP 823

is a cookbook with no room to modify recipes

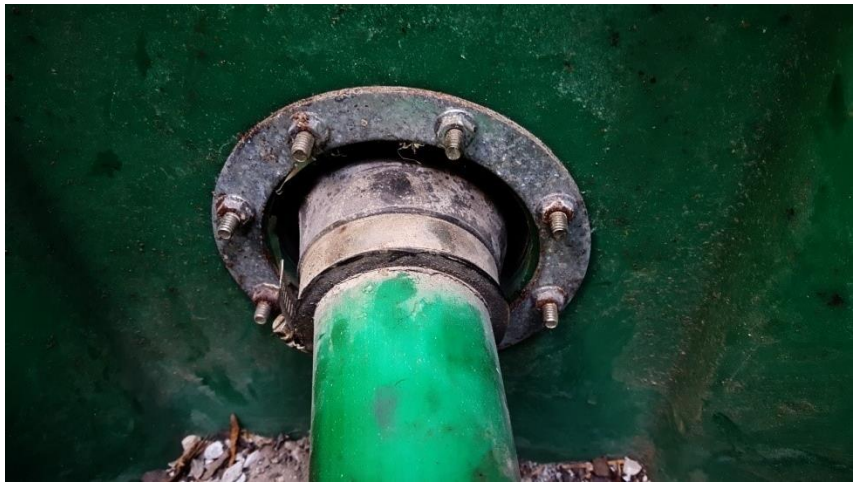
Split fittings and materials that could bond HDPE didn't exist

**Split Repair Boots allow for**

**Fitting repair without piping disconnection**

Split repair fittings with different designs for a wide variety of applications are a perfect example of the need to incorporate future innovations. Split repair fittings do not require piping to be disconnected.

Bonding to and Repair of HDPE Sump Materials
can now be reliably performed using chemical fusion bonding materials
which did not exist when NLPA/KWA RP 823 was first published



A standard is like a road map.
It helps everyone get where they want and need to be.

**Regulators Need Both Strength & Flexibility**

to be sure that rules are enforced and provide for viable options while maintaining a fair playing field

# Testing and Certification

Testing and certification cannot be limited to large national testing organizations.  Many smaller regional laboratories have the equipment and expertise to perform testing and certification of materials/devices for intended use and compatibility.

## NLPA/KWA Standard 823

Testing and certification is limited to qualified independent laboratories in the standard.

40 CFR Part 280 uses the terminology “nationally recognized association or independent testing laboratory.”

The NLPA/KWA committee agreed that “nationally recognized” applied to the association and that there would be no benefit conferred through reference to a “nationally recognized testing laboratory.

# NLPA/KWA Standard 823

**SCOPE** - Four processes are described in this standard.

-Sump structural damage repair with applicable structural adhesive bonders or patches.

-Repair or replacement of sump entry and test fittings.

-Field constructing a retrofit single double wall sump utilizing the existing sump as a fabrication mold.

Note: The process can, where allowed by the AHJ, be used to create a sump where one did not previously exist.

-Repair or replacement of sump lid assemblies to eliminate or prevent debris and surface water intrusion.



**TABLE OF CONTENTS**

# NLPA/KWA Standard 823

## REFERENCED DOCUMENTS

Lists documents which can provide additional information useful to the user of the standard.

Referenced documents include documents published by:

- The American Petroleum Institute
- The American Society for Testing and Materials
- The Petroleum Equipment Institute
- Underwriters Laboratories
- US Environmental Protection Agency
- US Occupational Safety and Health Administration



**TABLE OF CONTENTS**

# NLPA/KWA Standard 823

Also contained in the standard are:

- Criteria for Material Approvals
- Sump Evaluation
- Training and Certification requirements for installers
- General Safety Considerations
- Information on the different types of sump fittings
- Procedures applicable to the different types of repairs
- Repair/Replacement/New Construction of sump lids
- Testing and return to service
- Other materials of sump construction



**TABLE OF CONTENTS**

# NLPA/KWA Standard 823

Contained within the standard is a method for testing sump lids.

A large volume of water is applied to the sump lid area.

Where possible, the lid is completely submerged under the water.

Where it is not possible to raise the water level over the lid, water is applied constantly over the test period.

At the end of the test period and once the water has receded, the lid is dried and the sump is opened. A lack of water intrusion indicates a successful test,

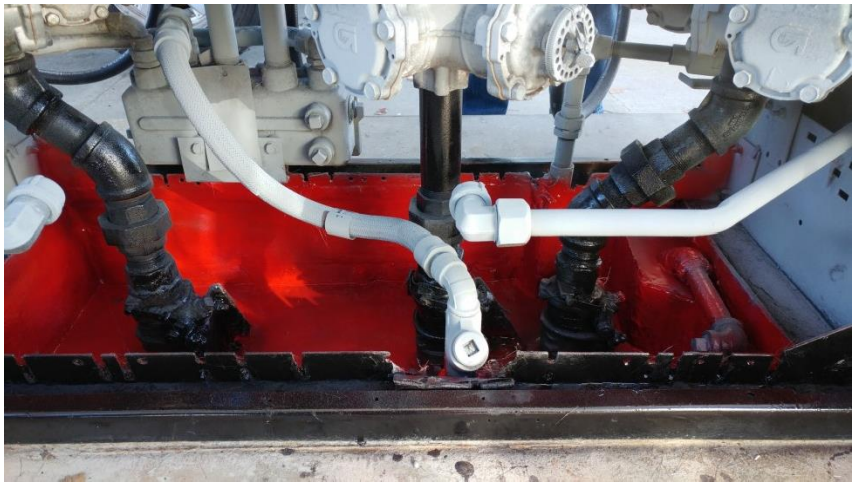
# Other Materials of Construction

**Concrete Sumps and Vaults**


**Require Periodic Maintenance**

# Metal UDC Sumps

Metal sumps are subject to corrosion.
Even a badly corroded sump can be used as a mold for a new containment sump construction



The NLPA/KWA Standard Committee is a balanced committee with representation from the regulatory community, the regulated community, sump repair system manufacturers and petroleum contractors.

In closing, I'd like to thank the committee members for their dedicated efforts as the standard is nearing completion.

I've listed the members below.

Joey Arn, Petroleum Containment, Inc.

Russ Brauksieck, US EPA/State of NY

Brian Daliege, Tanknology, Inc.

Oleta Martin, 7-Eleven, Inc.

Bill Hickman, CO Div. of Oil & Public Safety

Jeremy Templin, The Kroger Company

Alfred Reid, Broward County, FL Environmental & Consumer Protection Div

John Sieger, Sheetz Environmental Services

Scott Sharp, Armor Shield of America

Micah Nelson, S. Bravo Systems

Paul Reber, Icon Containment Solutions

Jimmy Spiros, Neumayer Equipment Co.

Ed Kubinsky, Jr., Crompco, LLC

# Question & Answer

Please address all questions to a speaker

THANK YOU FOR YOUR PARTICIPATION

UST Inspector Training Series: https://neiwpcc.org/our-programs/underground-storage-tanks/ust-training-resources-inspection-leak-prevention/webinar-archive-inspector-training/

LUST Corrective Action Series: https://neiwpcc.org/our-programs/underground-storage-tanks/lust-training-resources-corrective-action/webinar-archive-corrective-action/

LUST Line: https://neiwpcc.org/our-programs/underground-storage-tanks/l-u-s-t-line/

THANK YOU FOR YOUR PARTICIPATION

# UST Inspector Training Series

## Spill Bucket/Containment Sump Testing and Repair- 4/30/2020

Moderated by Nick Bissonnette- Environmental Analyst, *NEIWPCC*

THANK YOU FOR YOUR PARTICIPATION