**Underground Storage Tank** Installation and Modification PA DEP Initial Certification Course for UMX & UMI **Presented By:** Doug Kassay **Keystone Petroleum Equipment** 

# **UMI Category Added**

- Can complete Minor Modifications only
- Can complete certain testing activities
- Requires 2 years experience or college degree
- Technical training (this class)
- Requires work on 10 Minor Modifications under a certified individual

### **UMX Category Qualifier Change**

10 activities (at least 5 installs and no more than 5 major modification)

UMI certification is now a pre-qualifier



# Module 1 Health and Safety Issues Involved with UST Installation

#### **Health and Safety**

Causes of Accidents Hazards and hazard information Training Safety Equipment Safety Meetings, Inspections, and Checklists Planning for a safe job

#### What Causes Accidents?

Improper training
 Taking shortcuts / Cutting corners
 Complacency
 Distractions / Loss of focus







**Highly flammable** 

#### Hazards

Confined Space / Asphyxiation Chemical Exposure Trauma / Blunt Force Fire Weather Tripping





# Tripping

 Tripping is always a leading cause of jobsite injury
 Cords, slippery surfaces, poor house keeping (PUT AWAY TOOLS NOT BEING USED), debris, doorways







#### **Safety Training and Documentation**

- All workers should have general nationally recognized training (ie OSHA 40hr)
- General training requires an annual 8 hour refresher course
- Workers should also be trained in safety issues specific to the job
- All workers on the job need to be present
- Emergency response and safety plans should be reviewed and on site
- Confined space entry permit
- Material Safety Data Sheets (MSDS/SDS) should be available for each potentially hazardous substance involved with the job

# Safety Equipment

Harness, Helmet, Respirator, Air Filter, Explosive Gas Meter, Splash Suit, Eye Protection, Steel Toe Boots

- Communication Devices; radios, cell phones, landline
- All relevant safety contact information should be readily available







# Safety Equipment

- The atmosphere of any removal should continuously be monitored for the presence of hazardous vapors
- An explosive gas meter should be able to warn you about:
- 1. Explosive Environment
- 2. Oxygen Concentration Should be between
  19.5%-23.5%



#### Safety Walkaround-Inspection Checklist

Jobsite Location	Ticket/Serial No.
Date of Inspection	
Time of Inspection	
Supervisor/Foreman Name(s)	

#### Specific Job Hazards/Conditions

- D \_\_\_\_\_
- D \_\_\_\_\_
- •

#### **Existing Utilities**

- u Support adequate
- u Loose materials
- Utilities identified and protected
- White paint/flags
- u Lawful dig ticket in hand

#### Weather

- u Overnight freezing
- u Rain

#### Personal Protective Equipment

- Reflectorized vests in vehicular areas
- Hard hats, steel-toe shoes, etc. being used as specified.

#### General Observations and Conditions

- u Weather \_\_\_\_\_
- Traffie
   Terrain
   Other

#### Comments/Notes:

(Back of page to list local emergency contact information)

Pennsylvania One Call System, Inc.

Call Before You Dig

April 2009

# Elements of an Effective Jobsite & Safety Plan

- Training and Meetings
- Emergency Response
- Site Access
- Security
- Municipal and Community Concerns
- Site Specific Conditions
- Weather Impact and Control
- Subcontractors

### Elements of an Effective Jobsite Safety Plan

- Excavation
- Confined Space
- Personal Protective Equipment (fall protection)
- Hazardous Materials & Fire Prevention
- Tools, Heavy Equipment, Ladders, Welding Equipment
- Electrical Hazards
- Drugs, Alcohol, & Firearms
- Incident Management Procedures

# **Training and Safety Meetings**

- Do all employees have appropriate safety training for all activities they will be performing on the job site?
- Time and location of the initial safety meeting
   Where and when do daily safety meetings occur? On site? At the Shop?



#### **Emergency Response**



 Contacts: Fire Department, Hazmat Team, & Medical Response (911 or other)
 Expected Response Times
 Location of closest hospital or medical facility
 On Site First Aid and Rescue Procedures

# **Site Access**

- Who will be accessing the site during different phases of a job?
- How can people, vehicles, and large equipment SAFELY access a site? (Backfill delivery / removal; cranes, product delivery)
- How does site access interfere with traffic?
- Is the job interfering with sidewalks and pedestrian traffic?
   Traffic plan?



# Security

- Keeping individuals that don't belong on the site away from the site
- Using proper barricades and warning signs
- What measures need to be taken to prevent vandalism and trespassing ?



### **Municipal and Community Concerns**

- Pre-project meetings
- Specific municipal standards, regulations, and inspections
- Minimizing noise, dust, and traffic congestion
- Sanitation plan and good house keeping. Keep things Clean!!!



# **Site Specific Conditions**

Poor drainage Flooding Unstable soils Previously contaminated site Above and underground utilities Limited space Steep slopes



## Weather Impacts and Control

- What weather patterns are associated with the season that the project is occurring
- What measures are taken to mitigate the impacts of weather: Silt fences, snow plows, water displacement, berm, etc...



#### **Subcontractors**



Who are they Do they have appropriate general and site specific safety training Are they working unsupervised



### Excavation

Excavation equipment and storage
 Equipment operator
 Excavation area; Utilities, Soil Stability, Blasting



# **Confined Space**

Procedures and PPE
 Rescue Procedures
 What phase will this occur

 Personnel role assignments & training
 Entry Permit



### **Personal Protective Equipment**

General PPE for daily activities
 PPE for specific more hazardous activities
 Equipment is in good operating condition and properly fits the worker



### Hazardous Materials & Fire Prevention

- MSDS's should be available for all hazardous substances that are on a job site and these substances should be discussed at safety meetings.
- Fire extinguishers should be at every petroleum related construction job site.
- Fire protective clothing may be required PPE for some activities
- The safety plan should have steps used to mitigate chemical expose and fire hazards

# Tools, Heavy Equipment, Ladders, & Welding Equipments

- What tools and equipment will be used and how they will be used safely?
- Heavy equipment to be used (storage, operation, and entry/exit)
- Gas cylinder storage and security



# Lock Out Tag Out Procedures

- Never use equipment/tools that are not in proper operating condition
- If you feel anything is broken or not safe to use, tag & lock the component/device and inform your supervisor
- Never use a tool or equipment that is tagged



**PROTECT your coworkers** 



# **Electrical Hazards**

- Who will be handling the electrical aspects of a job? Are they licensed?
- Keep wires (live or dead) out of the way of human and job traffic (doorways)
- Always secure the electrical panels
- Don't work on anything unless the power is killed!



# **Drugs, Alcohol, and Firearms**





 Keep them off the jobsite!
 Keep in compliance with CDL, customer, and company requirements



#### **Incident Management**

Know who is in charge
What calls to make
Procedures that are in place
Discuss incident management at safety meeting

# What does the customer require in your safety plan?

## **Highlights from Module 1**

- Keep training up to date
- All workers need nationally recognized safety training and job specific safety training
- A person can work with an oxygen range of 19.5% to 23.5% without a respirator
- Do not work without the appropriate safety equipment
- Always protect your feet

#### **Video Presentation**

# Let's be careful out there!

Module 2 **Electrical and Fire Hazards Pennsylvania Department of** Labor and Industry **PA Title 34** Chapters 14 & 14a

# Flashpoint

- Flashpoint is the lowest temperature at which a liquid evaporates enough to form an ignitable air mixture
- Flashpoint of a liquid determines regulatory precautions that must be taken regarding fuel storage and dispensing.
- Liquids are classified based on their flashpoints



# Liquid Classes

#### Combustible Liquid: Closed cup flashpoint at or above 100<sup>oF</sup>

**Class II** Liquids flashpoints  $100^{\circ}F$  to  $140^{\circ}F$ **Class III** Liquids flashpoints  $\geq 140^{\circ}F$ 

#### Flammable Liquid: Closed cup flashpoint below 100<sup>oF</sup>

Flammable liquids are Class I Liquids




# **Common Flash Points**

Fuel/Liquid	Flash Point	Class
Gasoline	-40ºF	
Ethanol	55 <sup>⁰F</sup>	
Kerosene	110ºF	
Diesel	125 <sup>ºF</sup>	
Heating Oil	126ºF	
Bio-Diesel	266 <sup>ºF</sup>	
Vegetable Oil	620ºF	

# **Electrical Highlights - UST Systems**

- Conduit must be rigid
- Seal-offs must be the first fitting outside of a penetration
- Junction boxes must be explosion proof
- High voltage cannot be ran in the same conduit as the intercom speaker wire



# **Emergency Stop (L&I)**

- All sites: Must be at least one E stop > 20' from all dispensers but < 100'. A secondary E stop can be added no > 350'\*. Unattended Self-Serve: Plus one E stop per dispenser island group.
- Must physically break all wiring (power & data) to the devices in the hazard zone, including submersible pumps.
- The emergency stop must be clearly visible and marked.
- For attended locations the emergency stop must be within 15' of the attendant and the attendant must have a clear line of sight to the dispensing operation.



\* - Amended October 2023 via HB 1171, goes into effect 12/11/2023

# **Emergency Stop (IFC)**

- Must be at least one emergency stop > 20' from all dispensers but < 100'.</p>
- Must physically break all wiring (power & data) to the devices in the hazard zone, including submersible pumps.
- The emergency stop must be clearly visible and marked.
- For attended locations the emergency stop must be within 15' of the attendant and the attendant must have a clear line of sight to the dispensing operation.



# Labor and Industry

- Must receive authorization to begin work (comes after submitting applications)
- Dispensers must be >20 & <100' of an emergency stop, max e-stop can be 300' at new installations\*
- There must always be a clear line of sight from the E-Stop to the dispenser!!!
- A facility can operate after passing inspection
- Dispenser change outs require an inspection that should only look at the work performed
- \* Please be aware that there are significant differences between IFC2009 and L&I regulations, specifically with regard to the max 200' distance to E-stops. Consult the local municipality, some will defer to L&I other won't. Also be aware that L&I currently enforces the old regulations to sites that existed prior to the current regulations. If in doubt call L&I for clarification.

# **Highlights from Module 2**

- Dispensers must be within 300ft of the furthest emergency stop at new installation
- Emergency stop at an attended facility must be within 15' of the attendant
- Flashpoint is the lowest temperature at which a liquid evaporates enough to form an ignitable air mixture
- Flammable liquids have flashpoints below 100°F and combustible liquids have a flashpoint at or above 100°F

Module 3 **Pennsylvania Department of Environmental Protection Forms and Regulations Associated with UST** Installation and Modification.

# What is a regulated UST?

Underground storage tank - One or a combination of tanks (including underground pipes connected thereto) which are used, were used or will be used to contain an accumulation of regulated substances, and the volume of which (including the volume of underground pipes connected thereto) is 10% or more beneath the surface of the ground.

The definition does not include:

### This list can be found in the registration instructions

Reference	
Code	Description
U1	Tanks with a capacity of 110 gallons or less.
U2	Farm or residential tanks with a capacity of 1,100 gallons or less which store motor fuel for noncommercial
	purposes (not for resale).
U3	Tanks which store heating oil used on the premises where stored. Diesel, kerosene, etc., are included as long as they are used exclusively for heating.
U4	Pipeline facilities (including gathering lines) regulated under the Natural Gas Pipeline Safety Act of 1968, or the Hazardous Liquid Pipeline Safety Act of 1979, or which are intrastate pipeline facilities regulated under comparable state laws.
U5	Surface impoundments, pits, ponds or lagoons.
U6	Storm water or wastewater collection systems.
U7	Flow-through process tanks.
U8	Liquid traps or associated gathering lines directly related to oil or gas production and gathering operations.
U9	Storage tanks situated in an underground area (such as a basement, cellar, mine working, drift, shaft or tunnel) if the tank is situated upon or above the surface of the floor. The tank must be able to be visually inspected. These tanks may be regulated as aboveground storage tanks.
U10	Tanks regulated under the Solid Waste Management Act of 1980, including, but not limited to, piping, tanks, collection and treatment systems used for leachate, methane gas and methane gas condensate management, except if regulated under 40 CFR Part 280. Waste oil tanks are not included in this exemption.
U11	Septic tanks and other subsurface sewage treatment tanks.
U12	Tanks which store unregulated substances such as asphalt (solid @ 60°F), propane, water, sand and liquid animal wastes and any other unregulated substances.
U13	Tanks which store any substance defined as hazardous waste under Subtitle C of Resource Conservation and Recovery Act (RCRA) and not regulated under other Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) programs.
U14	Change in service from a regulated to a non-regulated substance or use. If the use or substance was changed to a non-regulated substance, the closure guidance requirements must be met.
U15	Sump tanks which are used as temporary storage for emergency spill or overflow containment and are expeditiously emptied after use.
U17	Tanks which have been "out-of-operation" and empty since Dec. 22, 1988. Tanks which do not pose a current or potential threat to human health and the environment.
U18	Tanks containing radioactive materials or coolants that are regulated under the Atomic Energy Act of 1954. Any UST system that is part of an emergency generator system at nuclear power generation facilities regulated by Atomic Energy Act.
U19	A wastewater treatment tank system such as an oil and water separator. Does not include an oil catch tank connected to an oil-water separator.
U20	Equipment or machinery that contains regulated substances for operational purposes such as hydraulic lift tanks (elevators) and electrical equipment tanks (electric transformers).
U21	Deminimus Concentration Tank. A tank that contains a regulated substance of insufficient concentration to be required to appear on a Material Safety Data Sheet (MSDS).

There are some tank exemption changes in the 2018 regulations, for complete details reference the definitions in section 245.1 & sections 245.403(c) & (d)

# **DEP Correspondence**

Reporting Spills Notice of Contamination 30 Day Installation/Closure Notification Registration Form Registration Amendment Modification Report Testing Activities (and forms) New Installation Product Fill Authorization

All forms can be found on DEP's website <a href="https://www.pa.gov">www.pa.gov</a> keyword search: storage tanks

# **Reporting Releases & Contamination**

- All PADEP certified individuals are required to report contamination to the appropriate regional office if encountered while performing a regulated activity
- Reportable Events:
  - A release of a regulated substance
  - Suspected or confirmed contamination of soil, surface or groundwater from regulated substances
  - A regulated substance observed in a containment structure or facility.





# UMX/UMI Reportable Event Examples





### Obvious and/or suspected contamination includes the following:

- Product stained or product saturated soil or backfill
- Ponded product in an excavation
- Free product or sheen on the water in an excavation
- Hole in the piping or tank
- Product in a containment sump
- Free product on a solid or cracked impervious surface

# **Notice of Contamination**

### What you must do:

- Verbal notification within 24 hours
- Written notification from the certified individual must be submitted within 48 hours of confirmation of the contamination (Notification of Contamination Form)

### What else you should do:

- Inform the owner and make him aware that he also has responsibilities for making written notice to the PADEP within 15 days
- Inform the owner that he should make notification to USTIF of the release; failure to notify USTIF within 60 days of the discovery of the release can result in USTIF denying the claim



### When do I report? Owner & Operators

- Any spill to soil or a waterway is reportable, this includes storm sewers
- A spill to an impervious surface in quantities greater than 25 gallons
- A spill to an impervious surface in quantities less than 25 gallons if you don't meet all 3:
  - Have control of over the release
  - The release is completely contained
  - The total volume of the release is recovered and removed within 24 hours of the release
- A release to a containment sump higher than the bottom of the first penetration
- After a failed or inconclusive investigation of a suspected release

### If you make a notification of release to the PADEP you should also notify USTIF



### § 245.304. Investigation and reporting of suspected releases.

(a) The owner or operator of a storage tank system or storage tank facility shall initiate and complete an investigation of a suspected release of a regulated substance as soon as practicable, but no later than 7 days after the indication of a suspected release. An indication of a suspected release includes one or more of the following conditions:

(1) The presence of a regulated substance or an unusual level of vapors from a regulated substance outside of storage tank system components designed to routinely contain or convey product, at or near a storage tank facility.

(2) Evidence of a regulated substance or vapors in soils, basements, sewer lines, utility lines, surface water or groundwater in the surrounding area.

(3) Unusual operating conditions, indicative of a release, such as the erratic behavior of product dispensing equipment.

(4) The sudden or unexpected loss of a regulated substance from a storage tank system or the unexplained presence of water in a storage tank system.

(5) Test, sampling or monitoring results, including the sounding of an alarm, from a release detection method which indicate a release.

(6) The discovery of holes in or damage to a storage tank system during activities such as inspection, repair or removal from service.

(7) Other events, conditions or results which may indicate a release.

# When do I report?

installers & inspectors

- A release (any release regardless of gallons or where it occurred)
- Suspected or confirmed contamination
- A regulated substance observed in a containment structure or facility (make sure your sumps are clean and dry)
- Certified individual performing testing must report a failed test (sump, overfill, spill prevention testing)

A reputable certified company should also remind the owner to call USTIF





# HOW DO I REPORT? Notice of Release

(Owners & operators)

- Verbal notification to the PADEP (and any affected utilities) within 24 hours by owner/operator to regional office
- Written notification by owner/operator filed within 15 days to the appropriate regional office and local municipality (Notification of Reportable Release Form)

### NOTICE OF CONTAMINATION (INSTALLERS & INSPECTORS)

- If a certified individual is performing a regulated activity at a facility they are required to report
- Verbal notification within 24 hours to the appropriate PADEP regional office
- A certified individual must submit a written notification within 48 hours (Notification of Contamination Form)



## Notification of Contamination Form Certified Individuals Notification of Reportable Release Owners and Operators

- They are the same form!!!
- Facility specific information
   Name, Address, DEP ID #, Municipality, Site Contact (operator), and phone #
- Owner Information: Name, Address, Phone Number
- Spill Information:
  - Product, Quantity, Date of Event
  - Have any remedial actions been taken???
  - Is the release confirmed or suspected?
  - How did the release occur and is it contained?

# **30 Day Installation Notice**

- Required for all regulated USTs installed after Nov 10, 2007
- Must be submitted 30 days prior to initiation of tank handling activities
  - New system installation
  - Dispenser replacement or adding new dispensers
  - Installation of new piping
  - Replacement of piping if >50%
- This is the same form as the 30-day closure notification



# **PADEP Registration Form**

- Used to register new tanks for use at a facility or to set up a new facility
- Make sure all of the information on the form is accurate
- Filing the registration form alone does not allow the facility to begin operation. You or the owner should request a copy of the temporary permit
- A delivery company should not drop unless they see a copy of the temporary permit or an approved New Installation Fill Drop form

# **Registration Amendment Form**

- Used only to make administrative changes at a facility
- Change of regulated product type
- Operator or contact information changes
- Changes in operating status (Temporarily Out of Service)
- Can't be used to make physical changes about the tank system

# **Modification Reports**

- Needs to be submitted within 30 days of the completion of tank handling activity(s) by the certified individual completing the activity
- Know the difference between major modifications & minor modifications, and maintenance activities
- Only major and minor modifications require certification and the report to be submitted
- USTIF bills you for each major modification report that is submitted.

Page 2 of 2

			FEE	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	500.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	135.00
7/2010		EP).	ACTIVITY DATE	03/26/2010	03/26/2010	03/26/2010	03/22/2010	03/22/2010	12/03/2009	12/03/2009	03/10/2010	03/10/2010	TOTAL CODE UMX:	09/29/2009	09/29/2009	09/29/2009	09/29/2009	03/24/2010	03/24/2010	03/24/2010	03/23/2010	03/24/2010	TOTAL CODE UMR
06/0		rotection (D	CODE	NMX	NMX	XMU	XMU	ZMU	UMX	NMX	XMU	XMU		UMR									
	dress: LTD 055-4511	ronmental P	TANK ID	68987	68989	68990	135970	910382	1014415	1014416	154581	154583		43212	43213	43214	43215	60724	60725	60726	60727	60728	
on Program	Cert'ified Company AC KEYSTONE PETRO EQUII 981B W TRINDLE RD MECHANICSBURG, PA 17	as reported to the Department of Env	NAME	PRISES	PRISES	PRISES	D STORE DISTR	D STORE DISTR	LIMERICK	LIMERICK	80	σ		LIMERICK	LIMERICK	LIMERICK	LIMERICK	RVIEW MOBIL 5					
mificati lding [in PA] e.pa.us	JTD 5-4511	es performed	FACILITY	HET ENTER	HET ENTER	HET ENTER	GIANT FOO	GIANT FOO	GIANT 284	GIANT 284	SHEETZ 28	SHEETZ 28		GIANT 284	GIANT 284	GIANT 284	GIANT 284	TOMS CLEA					
Installers' Indem iol Associates Bui I. 7th Street sburg, PA 17102 : (717)787-0763 (800)595-9887 l: ra-ustif@state ite: www.insuranc	ANY ID: 116118 .NG ADDRESS: ONE PETRO EQUIP I W TRINDLE RD NICSBURG, PA 1705	s are calculated by activiti	FACILITY ID	21-21052 / 589070	21-21052 / 589070	21-21052 / 589070	21-23683 / 589109	21-23683 / 589109 21-25182 / 588241	46-15551 / 604119	46-15551 / 604119	50-37915 / 607864	50-37915 / 607864		46-15551 / 604119	46-15551 / 604119	46-15551 / 604119	46-15551 / 604119	67-28007 / 616137	67-28007 / 616137	67-28007 / 616137	67-28007 / 616137	67-28007 / 616137	
Tank Capit 901 N Harri Phone E-mai	COMP/ BILLI KEYST 981B MECHA	Activity fee	CLIENT ID	175535	175535	175535	173864	173864 186685	175585	175585	180621	180621		175585	175585	175585	175585	173864	173864	173864	173864	173864	

# **UST Major Modifications**

- Repairing, removing or replacing any part of the tank
- Replacing or repairing equipment when excavation is required
- Adding ancillary equipment
- Installation, repair or replacement of interior (internal) tank lining or coating
- Installation of corrosion protection systems or anodes on cathodic sacrificial and impressed current systems.

# **UST Minor Modifications**

- Staking and placing of concrete forms over the tank field.
- Replacement, repair or removal of aboveground piping associated with the system (excluding dispenser components)
- Replacement, repair or removal of the check valve in a suction system
- Replacement or removal of leak detector/pump-manifold (packer) assembly
- Replacement, removal or disconnection of flexible piping connectors
- Replacement or removal of primary piping through extraction from the secondary piping or double walled piping systems or double wall piping from a tertiary conduit when accessible from aboveground or through manways (not involving an excavation)

# **UST Minor Modifications**

- Replacement, removal or disconnection of shear valves
- Installation or replacement of anode bags or spike anodes on flexible piping connectors
- Installation or replacement of isolation boots.
- Installation of a line leak detector
- Changing the type of line leak detector, such as, mechanical to electronic
- Installation, repair or replacement of overfill prevention devices
- Installation, repair or replacement of spill containment devices
- Initial installation or complete replacement of an automatic tank gauging system
- Replacement of a complete dispensing unit

# **Maintenance Activities**

Changing circuit boards and electrical repairs Changing filters Calibration Cleaning and painting Replacement of like for like leak detector Replacing sensors Changing hoses and nozzles

# **Certified Testing Activities**

- The 2018 regulation changes now require that owner required compliance testing activities be done by certified individuals (must also possess the appropriate manufacturer certification if required)
- Test results must be done on Department forms and be signed by the tester and the owner
- Failed test results require the NOC form & the test results be submitted (ie.. Call in notice within 24 hours, submit forms in 48 hours)

	UMX/UMI	UTT	IUM
Spill Containment (Every 3 years)	Х	Х	X
Containment Sumps (Every 3 years)	Х	Х	X
Overfill Prevention Equipment (Every 3 years)	Х		
Release Detection Equipment (Annual)	Х	Х	X
Tank/Piping Tightness Testing (Annual - Lines)		Х	

Document Submission - When - Where

Form	Submission Timeline	Regional	Central
FOI	60 Days	×	×
Lining Inspection	60 Days	×	Х
Mod Report	30 Days	×	Х
30 day Install/Closure Notice	30 Days Prior	×	
Closure Report	30 Days	×	
Release Reporting	48 Hours	×	
Overfill, Spill Prevention or Containment, and UTT Test Failures	48 Hours	×	
Installation Registration	30 Days		Х
Amended Registration (1 Page)	30 Days	×	х
Closure/Removal Registration	30 Days	×	х
TOS Extension Request Letters	Prior to Expiration		×

4

DEPARTMENT OF ENVIRONMENTAL PROTECTION

# **Highlights from Module 3**

- A modification report must be submitted within 30 days of the completion of the activity
- Use the DEP modification guidance to reference the differences between maintenance, major and minor modifications
- Owner has 15 days to submit a notification of contamination/reportable release form
- Certified tank handler has 2 days (48 hours) to submit a notification of contamination/reportable release form

Module 4 Excavation Related to the Installation and Modification of Underground Storage Tank Systems

# **Excavation Considerations**

Burial depth and soil conditions
 What are the required set backs from property lines, buildings, and roadways? Always consider where equipment will be safely stored

- Locate utilities above and underground (especially for upgrades at existing facilities)
   PA One Call
- Backfill type: crushed stone, pea gravel, sand
- Chances of encountering ground water or contamination

# PA ONE CALL www.paonecall.org

 Your company work site information
 Location including address, county, municipality and two nearest intersections

Depth and area of excavation
Duration of work
Area should be marked in white

1-800-242-1776





# PENNSYLVANIA ONE CALL SYSTEM, INC.

	Dig <sup>3</sup> Safely. www.paonecall.org CALL 1-800-242-1776 WORK LOCATION REQUEST FORM	
TELEPHONE NUMBER: ( COMPANY NAME:	) EXT: CALLER:	
ADDRESS:		
CITY:	STATE: ZIP:	
WORKSITE INFORMATION:		
COUNTY:	MUNICIPALITY:	WARD:
STREET ADDRESS:	STREET NAME:	
SECOND INTERSECTION:		-
	es 🗌 No	
LOCATION INFORMATION:	1	
SUBDIVISION:	TYPE OF WORK:	
WORKING IN: 🔲 STREET	🗌 SIDEWALK 🛛 PUBLIC PROPERTY 🛛 PRIVA	ТЕ РКОРЕКТҮ
	ECIFY)	
	EXTENT OF EXCAVATION:	
DURATION OF JOB:	PERSON TO CONTACT:	
PHONE:( )	EXT:BEST TIME TO CALL:	
FAX #: ()	EMAIL ADDRESS:	
REMARKS:		
		TIME-
DESIGN (Not less than 10 nor more	o than 90 Business Days)	
	TO BE COMPLETED AFTER PLACING ONE CALL	
OTHER SERIAL NUMBERS REI	FERENCED:	
FACILITY OWNER MEMBERS N	NOTIFIED:	
SERIAL NUMBER ASSIGNED:	DATE/TIME:	

THERE IS AN ANNUAL FEE

1/3/2007

# PA ONE CALL Web Ticket Entry

- PA One-Call requests can now be made online
- To participate in this system, you must attend a two-hour training session
- This system benefits regular users of the one-call system by cutting entry time from 10 minutes to 4 minutes
- Web tickets can be entered 24/7



# **Types of Excavation**

Sloped /

# Stepped

# Shored

# **Sloped Excavation**

Know the soil type and stability
 This will determine the slope for the tank excavation that should be used


### **OSHA Soil Types**

Soil or Rock Type	Maximum Allowable Slope (H:V) for Excavations Less Than 20 Feet Deep		
Stable		Vertical	
Rock			
ΤΥΡΕΑ	Hard Packed soils, clay, clay loams, sandy clay	3⁄4:1	
TYPE B	Previously disturbed soils, silt, angular gravel, unstable dry rock.	1:1	
TYPE C	Granular soils, sand, gravel, loamy sand, submerged soil.	11⁄2:1	

# Stepped Excavation Steps should be no more than 4' in height



# Shoring

#### Takes the least amount of space but adds time and costs to a job



# Filter Fabric (Geotextiles)

- Geotextiles are permeable fabrics which, when used in association with soil, have the ability to separate, filter, reinforce, protect, or drain
- Primarily used in tank excavations to separate the native soil 'fines' from infiltrating into the tank field backfill

# Securing the Site / Excavation

The site must always be secured while personnel are not working
Barricades, fencing, and equipment are common barriers
No smoking signs
Be aware of traffic in and around the site

#### **Highlights from Module 4**

A tank should always be installed at least 3 feet from a property line

Soil conditions influence the excavation

Always call before you dig and mark the proposed excavation area in white

# Module 5 Practices and Procedures Involved with Tank Testing and Installation

#### **Tank Pre-installation**

- Documents
- Moving the tank
- Storing the tank
- Pre-installation inspection and testing

# Tank Specification & Warranty Sheet



#### VALIDATION CERTIFICATE STRUCTURAL WARRANTY

Installation Checklist And Inspection Procedure For Fiberglass Underground Tank Installation

\*This checklist must be completed in its entirety to validate the structural warranty. For warranty details, see the approvate Containment Solutions Tank Warranty Publication.

Job Name	Owner	Lalo		
Job Site Address	City	State		
Installation Contractor	Address Ecreman Tile			
Coner Reorgsontativo				
Installation Checklist Picase initial each item as it is completed.	sp.		contractor Gep	DATER Rac.
A.1 Pre installation result(sample wait rains     Fave you present lasted the angle-wait     - 4.8% 10" tanks to 5 os ?     - 12" tanks to 5 os ?		Unstable Excavations (all size tanks) require. • Minimum of 1/2 the bank diameter from ends and sides of tanks to excavation walls. • Minimum 181 (241 preferred) between		
Have you appled a scary water value     over the entire tark suitace     over all fittings?     Have you constally inspected for leaks as		adjacent tanks (24" for 12" tenks) D. Anchoning - viewe you reviewed the expanation for		
A.2. Prenetalitation Testing-Double Wall Tanks - Have you tosted double walliar is in strict conformance with the Test instructions Label No 122002 wrich is an the tank?		<ul> <li>potential faciding from a high valer table?</li> <li>Have you reviewed the excevation for potential fooding from surface waler runo??</li> <li>Have you can piled with the anchoring implies month as slate in the installation instructions.</li> </ul>		
Caution: Do not connect the air pressure fine directly to any annular space fitting. • Complete the Hydrostadc test of the secondary containment calls:		for: - Concrete another tast? - Concrete deapmen? - is the owner's representative aware of the	_	
<ul> <li>Did you fill the colar with water, let set for 12 hours, then check for leaks?</li> <li>B. Bed and Backfill</li> </ul>		<ul> <li>anchoring robulements?</li> <li>Is anchoring not required for this installation?</li> </ul>		
<ul> <li>Bed and backfill must meet all ASTA C 33 requirements for quality and soundness.</li> <li>Approval to: Grund hus: consist of a clean naturally rounded apgrogate with a mix of canticle sizes not less than 1/8" or more than 3/4".</li> <li>Approved crustes a concert crustine grave must</li> </ul>		<ul> <li>E. Installation Procedures</li> <li>Have you provided the minimum 12' level bedring in approved bedrift insterrati?</li> <li>Have you corportly pushed the mills instative 12" fills of backfill under the tank betome, between ros and under the non-cape lait</li> </ul>		-
be washed with angular particle size not less than 178° or more than 172° • Does your bed and backfill meet those		elminate volts? Have you completed the beckfilling to multop of the tanks in uniform lifts?		
<ul> <li>Have you obtained a simulariallysis from a qualified coll engineer of from the backfill supplier?</li> <li>Have you alloched the size analysis? Supplier Type:</li> <li>Webter you used movies in crusted Stone.</li> </ul>		<ul> <li>Dd yo, comproty fill the law will walk or croduct, after the twick line (has been properly in shed?)</li> <li>Except shed?</li> <li>Except on work to ciristallation (see Con- tainment Sclutions Pathicstom "like" attor- histractions for Theraphase Reinforced Plastic Underground Sturage Tanks and Reislad Accessores</li> </ul>	_	
dces no nore that 6% of the backfill material pass through a #6 serve? C. Hole Size • A loo for proper spacing as required. Shable Excervences (4 through 10 dia: tanks) required • Minimum 0181(24 crefer red) tanks (required as seen tanks (24 for 12 tanks). • Minimum 181(24 pre-and a betwoon tanks sides and mick and the exceedion walls (24 for 12 tanks).		<ul> <li>Duty on camply with the requiraments for         <ul> <li>poper cumal depth?</li> <li>pod hickness for traffic loads?</li> <li>Soci Institution instructions for socialist</li> <li>Contament Solutions surgers the Use of fittor fabric on the Solutions surgers the Use of fittor fabric on the Solutions surgers the Use of fittor fabric on the Solutions (and the Solutions of an oundoors, enners subjected to featured) of ang- ing ground water levels; Unstate scale in runk on land IIIs, see socion 44 installation in the to- tions? Water conditions with all you!</li> </ul> </li> </ul>		

(if applicable (?

#### TANK NUMBER F. TANK INSPECTION PROCEDURES 1. Underwriter Laboratories label or tank serial number (to correspond with in voices and UI. label on tank.) (U. L. label only appropriate for petroleum tanks) 2. Tank nominal capacity (gallons) 3. Tank Measurements (use fill location) a. Intermediate tank measurements in inches (to help confirm proper backfill and ballast procedures) (1) After pressure test, measure tank internal diameter prior to back filling (see I below). (2) After backfill is to top of tank, measure from tank bottom tobull or of fitting (see I below) (3) Calculated tank deflection with backfill at tank top (subtract measuremont a2 from measurement a1). Refer to Table A for max, deflection. b. Final Tank Measurements in inches (to help confirm lank has proper support) (1) Initial tank measurement (from a1). (2) After backfill is at subgrade (prior to surface pad) measure from tank bottom to top of fill tube (prior to installation of drop tube)(see II below). (3) Measure from bottom of fitting to top of fill tube (see III below). (4) Calculate tank internal diameter (subtract measurement b3 /rem b2) (iii) Tack detlection (aubtract measurement b4 from b1). Beter to Table A

#### Measurement Instructions

All measurements for vertical detection are made from the bottom of the tank to the bottom of the fifting. All necesurements should be made in inches using a standard nonmetallic gauge stick. All measurements should be made through the fill fitting (use the same filting for all measurements).



Measurement 1 is the inside dameler of the tank at the gauge opening. Measure from the bottom of the tank to the bottom of the tank suement should be takken prior to

Table A		
Tark Diameter 4*	Meximum Deflection 1/2*	
6	3/4*	
8	1-1/4*	
10'	1-1/2"	
12	1-1-2*	

Installation was in accordance with Fluid Products Installation Instructions Pub. No. INST 6001.

Owner's Representative	Title
Contractor's Representative	
Notary Public (Optional)	Date

NOTE: Owner must retain this document to substantiate any future structural warranty claim.

Tank Technical Support (936) 756-7731

Copylight 6/2021 Containment Boblions, Inc. • All Rights Received • Little U.S.A. • GPoN/2-01 • Pub. No. NST 60220

# Tank Warranty and Specifications

- Measure the tank diameter upon arrival and make sure it matches the plans and the warranty sheet
- Look for manufacturer contact information
- The site should be secure, including the tank storage area. Barricades, no-smoking signs, fencing, and equipment
- Check for conflicts between the tank warranty and the job specs

# **Pre-installation Testing**

- Once again follow manufacturers instructions
- Always test before placing in excavation and backfilling
- First perform a basic visual inspection of the tank to check for possible damage
- Never leave a tank under pressure unattended

## **The Soap Test**

- Remove plugs, apply pipe dope and reinstall
- Use a pressure gauge with appropriate range
- 0-10 psi is best. 0-15 is maximum
- Increments should be in 1/4 or 1/2lb
   NEVER USE A VACUUM GAUGE

# **The Soap Test**

- Pressurize the tank between 3 and 5psi, in accordance with manufacturers instructions
- NEVER PRESSURIZE ABOVE 5PSI!
- Using a pressure relief valve is highly recommended.
- 12' diameter fiberglass tanks should not be pressurized above 3psi
- Monitor pressure for at least 30 minutes
- Apply soap to all surfaces and inspect for bubbles
- If any problems are detected, cease installation and contact the manufacturer immediately

## The Soap Test - Double Wall Tanks

All regulated USTs installed in PA now must be double wall; no exceptions! Seal all fittings as previously discussed. Connect the primary and secondary walls with a ball valve Pressurize the primary tank with the ball valve between the two walls closed.

#### The Soap Test - Double Wall Tanks

- Disconnect the pressurizing device.
- Open the valve between the two walls, pressurizing the secondary wall
- Pressure gauges must be used on both walls

Use a pressure relief valve on both wallsSoap and inspect as previously discussed



## **Other Pre-installation Tests**

If a fiberglass tank is filled with a brine solution, inspect all exterior surface for signs of leakage and monitor the liquid level regularly

For tanks that come with a vacuum pulled on the secondary wall, monitor the vacuum gauge confirming it is within the manufacturer's guidelines

# **Highlights from Module 5**

- Compare the tank warranty sheet to the tanks and job specs
- Always follow the manufacturers guidelines for pre-installation testing
- Never use a vacuum gauge for a preinstallation air test
- Never pressurize a tank above 5psi

Module 6 Tank Characteristics Handling and Backfilling

# Moving the tank

- As with most things, always follow the manufacturer's instructions
- If you are moving a tank, you are lifting a tank, never drag or roll
- Lift by the lifting lugs
- An individual should hold a rope tied to either end of the tank (or both) for directional stability
- Never put chains or cables around a tank shell

# **Tank being lifted**



#### **Bedding and Backfilling Material**

- Make sure material is approved by the tank manufacturer
- Pea Gravel, Crushed Rock, and Sand are the most common
- Cement slurry is NOT acceptable
- <sup>3</sup>/<sub>4</sub>" is usually the largest permissible size (always read manufacturer's specs)
- Bedding should be at least 1' thick

# Compaction

TANK

- Most bedding materials are relatively self compacting
- Extra attention should be paid to compacting the material under the lower quadrant of the tank. Chock to around 8 and 4 o'clock on the tank

## **Tank Deflection**

- Deflection in the tanks vertical diameter can cause structural damage
- Failing to compact the backfill, voids in the backfill or bedding, and over tightening of anchoring straps are common sources of deflection
- The manufacturer has guidelines for the maximum allowable deflection, they use the tank warranty sheet to verify that max. deflection was not exceeded

# Ballasting

- Putting liquid in the tank to weigh it down during construction
- Should only be done after backfill is brought to tank top
- Water is the preferred and safest ballasting material. Ensure all water has been removed before adding fuel
- Fuel can be used to ballast. A one time drop form (or registration form) must be submitted to PA DEP and extra attention needs to be paid to properly venting the tank an other safety issues
   If fuel is used then tank release detection must also start. Discuss with owner

# **Highlights from Module 6**

Moving a tank means lifting a tank

- Lift by the lifting lugs; do not put chains or cables around a tank
- Pea Gravel, Crushed Stone and Sand are common acceptable backfill materials
- A worker(s) with a rope tied to either or both ends of the tank should be used to steady the tank during lifting

# Module 7 Practices and Procedures Involved with Anchoring USTs



# **Excavation Conditions**





# **Tank Floating**

Buoyancy is determined by tank diameter and capacity. Construction material plays a smaller roll

- When buoyant forces are greater than restraining forces, a tank will float
- Tanks are prone to floating in areas subject to high water tables and flooding
   Increased burial depth, deadmen anchors, and hold down pads are the most common methods of applying restraining force,







# Anchoring by burial depth

- Increasing burial depth increases restraining forces
- Generally, a burial depth that is 60% of the tanks diameter is adequate restraint for tanks 8' or less in diameter
- When calculating burial depth, an inch of reinforced concrete can be considered 1.5" of backfill

#### **Cover Requirements**

TrafficNon-Traffic30" backfill + 6" asphalt24" backfill + 12" earthoror18" backfill +12" backfill + 4" reinforced6-8" reinforced concreteoror12" backfill + 6" asphalt

Tank pad should always extend at least 1' beyond the perimeter of the tanks

## **Maximum Burial Depth**

Fiberglass tanks typical max. burial depth is 7'
 Steel tanks should have the max. burial depth marked on the tank. It is typically 5'

Anything in excess of this, consult with the manufacturer for approval to as not to void the tank warranty.

# Mechanical Anchoring Dead-men Anchors

- Beams of reinforced concrete placed along both sides of the tank in the bottom of the excavation
- Straps go over tank and connecting opposing deadmen
- They must go the entire length of the tank
   There must be at least two anchor points per deadman

#### **Dead-Men Anchors**

 Dead-men must be placed outside the diameter of the tank.


### **Dead-Men Anchors**



# Mechanical Anchoring Bottom Hold Down Pad

- 8" of reinforced concrete at the bottom of the excavation
- Must extend 18" beyond the sides of the tank and 1' beyond the ends

Bedding can be reduced to 6" over the hold down pad for steel or steel jacketed tanks. It still must be at least 1' thick for fiberglass tanks

# Straps used with hold-down pads and dead-men

- Both dead-men and hold-down pads use straps over the tank
- Straps are usually furnished by the tank manufacturer. Do not use round bar or wire ropes. If using flat steel, it must be electrically isolated from the tank
- Straps are usually attached with a turnbuckle for easy tightening

### **Highlights from Module 7**

- Areas with high water tables and/or prone to flooding are more susceptible to tank floating
- Tank diameter and capacity are the main factors in determining tank buoyancy
- The maximum burial depth for a fiberglass tank is 7'
- Deadmen must extend the entire length of the tank
- A hold down pad is 8" thick and extends 18" beyond the sides and 12" beyond the end of the tanks

Module 8 Tank Types, Characteristics and Specifications

### **Tank Types**

### **Post November 2007 Installed Tanks**

- Double Wall Steel
- Double Wall Fiberglass
- Clad Double Wall Steel (Act 100)

### Pre November 2007 Installed Tanks - Tank Top Upgrades

- (Pre-2007) Single Wall Steel
- (Pre-2007) Single Wall Fiberglass
- (Pre-2007) Single Wall Steel with internal lining

# Tank Characteristics <u>Coated Double Wall Steel Tanks</u> Commonly referred to as an ACT-100 tank Conforms to UL 58 & UL 1746 Part II Structural integrity of steel and the corrosion resistance of fiberglass



### **Tank Characteristics**

**Double Wall Steel Tanks (STI-P3)** 

- Conforms to UL 58
- Cathodically protected tank
- Factory installed anodes
- Warranty is usually less then fiberglass
- Requires continual CP testing



**Tank Characteristics Double Wall Fiberglass Tanks** Conforms to UL 1316 Corrosion resistant Warranties of 30 years is not uncommon Dry interstitial are slightly more buoyant than steel



### **Tank Characteristics**

### **Tank Interstitial Space**

- Dry for steel. Wet or dry for fiberglass.
- Steel tanks interstitial space is usually accessible via a straight tube and can be monitored manually
- Fiberglass tanks interstitial space is usually accessible via a tank top opening with no direct access to the bottom
- Wet interstitial spaces can be manually monitored by liquid level observations
- The wet interstitial space in a fiberglass tank can be affected by fluctuating ground water levels or other external forces

### **Tank Specifications**

Any tank order from the factory should come with a full set of drawings and specifications which will cover:

- Tank dimensions
- Tank weight (needed for proper crane sizing)
- Tank lifting points
- Anchor strap locations
- Tank top openings
- Tank installation instructions & installation testing procedures

If you are responsible for tank placement on site keep in mind your fill location relative to the tanker truck & the location of the submersible relative to the piping runs





Module 9 Practices and procedures for the installation of piping associated with USTs

# Piping

### Product Piping

Must be double-wall

- Must be UL listed and compatible with the product stored
- Must be sloped toward tank at least 1/8" per 1'

### Vent Piping

- Can be single-walled
- Usually constructed of fiberglass
- Sloped toward tank at least 1/8" per 1'
- Aboveground vent riser must be constructed of steel

PADEP no longer requires new sites in certain counties install stage II piping

# **Piping Trenches**

Minimize piping runs across the tank top and avoid crossing lines whenever possible

- Piping trench should allow for at least 6" of bedding and 6" of clearance from the trench wall and 18" of cover
- Lines should be at least 2X pipe diameter apart
- Measure so the lines are properly sloped back to the tank

# **Typical Petroleum Piping**

### Flexible

- Polyethylene (UPP)
- Nylon 12 (FFS)

Rigid
 Fiberglass
 Steel (industrial)



PetroTechnik UPP pipe



FFS – XP pipe



AO Smith – Red Thread II Fiberglass pipe

## **Piping Installation**

Carefully inspect piping prior to installation

Install piping at a uniform slope (usually towards tanks) to reduce risk of vapor pockets and to allow for proper interstitial monitoring

Match piping to the correct flexible connection

### **Piping Replacement**

Replacement of 50% or more of piping requires the new piping system to meet the new install standards:

Positive Shutdown

Sump Testing

Complete double wall (sumps & piping)

A closure report must be completed unless the piping being replaced is being pulled through an existing chase (no excavation)

### **Dispenser Replacement**

UDC must be added for a dispenser replacement when all equipment between the piping and at or below the shear valve are replaced 245.422(b)(2)

Any dispenser new to that dispenser location, plus everything needed to get from the top of the shear valve(s) to the actual pipe that travels underground from that dispenser to the UST (or next dispenser)

# **Piping Testing**

- Test piping @ 1.5 X max operating pressure
- Never use air to test piping that previously contained product. Use nitrogen or helium instead
- Secondary flexible lines are usually tested between 3-5psi (manufacturer's instructions) Soap test similar to tanks
- Pressure test vent system piping using the soap method

# **Highlights from Module 9**

- All newly installed product piping must be double wall
- Never test piping over 1.5x max operating pressure
- The minimum slope for piping is 1/8" per linear foot
- Install piping at a uniform slope to avoid vapor pockets

# Module 10 Components Associated with Underground Storage Tanks

# Layout of the top of the Tank

- A. Flow Channels
- B. Tank Bottom Deflector Plates
- C. Primary Tank Fittings
- D. Monitoring Fitting
- 1. Turbine Enclosure
- 2. Fitting Kits for Turbine Enclosure
- 3. Secondary Containment Collar
- 4. Reservoir Sensor
- 5. Fiberglass Reservoir (replaces monitoring fitting)
- (replaces monitoring itting)
- 6. Containment Collar Sensor
- 7. Monitoring Fluid with Color Tracer
- 8. Electronic Inventory Gauge
- 9. Electronic Control Panel
- 10. Split-Strap Anchor System
- 11. Deadman Anchor
- 12. Dispenser
- 13. Dispenser Sump
- 14. Double-Wall Pipe
- 15. Submersible Pump
- 16. Fill Tube with Overfill Shut-Off
- 17. Ball Float Valve
- 18. Overfill Spill Container
- 19. Primary Tank Vent



# **Spill and Overfill Control**

Spill and overfill control is designed to eliminate releases that occur during the transfer of product to UST systems

- It is estimated that 70% of petroleum releases are caused by spills and overfills
- USTs that receive deliveries of 25 gallons or less are not required to have spill and overfill control

## **Spill Containment**

- Required around all fill pipes and any tank port associated with product transfer (does not include dry-breaks)
- Must be liquid tight. All spill buckets must be tested upon installation or replacement/repair of an existing spill bucket
- There is nothing in the PA regulations that say a spill bucket must be 5 gallons

### **Overfill Prevention**

Must automatically shutoff the flow of product to the tank at 95% capacity or restrict the delivery or alert the driver at 90% capacity

### **Overfill Prevention-Drop tube shutoff devices**

Maximum action point of the shut-off valve is 95% of the tank's capacity at the highest, they can be set them lower
These devices are rated for either pressure deliveries or gravity deliveries, make sure you know the method before installing

### Overfill Prevention Drop-Tube Shutoff Devices

Advantages Easily verified

Hopefully an easy install (no power needed) <u>Disadvantages</u>
 Easily bypassed by delivery driver

Must be changed if the customer switches delivery methods

## **Ball Float Valves**

No longer allowed to be installed, repaired or replaced, but if existing and functioning they are still allowed

- Works on the theory that if air can't exit the tank, fuel can't go in
- Action point must be set at 90% of the tank's capacity at highest
- Typically installed with an extractor fitting which allows for the ball float valve to be removed/replaced without breaking concrete.

## **Ball Float Valve**

### OPEN

### CLOSED



### **Ball Float Valves**

- <u>Advantages</u>
- Low cost
- <u>Disadvantages</u>
- Not easily verified
- No one knows if/when it breaks
- Tank can be damaged if it receives a pressurized delivery
- Can be very difficult to remove

Cannot not be used on systems with remote fills, coaxial vapor recovery, and suction systems with an air eliminator

## **External Overfill Alarms**

Audible and/or visual alarms that notifies the driver when the tank is 90% full

It must be audible and/or visible to the driver while he or she is making the delivery



### **External Overfill Alarms**

### <u>Advantages</u>

### Can be used for either type of delivery method

Easily tested

Disadvantages Expensive

May need to run additional conduit on an existing site

Does not physically restrict the delivery

### Secondary containment sumps

Installed at both ends of piping and/or at piping transitions

Contains product in the event of release

Can isolate metallic piping components (flex hoses/connectors) from soil contact

### **Secondary Containment Sumps**

PADEP regulations require containment sumps to be tested upon installation or modification (including piping replacement) Most commonly performed by flooding the containment area with water and monitoring the level for at least one hour Water Level should be at least 4" above highest sump penetration

**Sump Testing** 




## **Leak Detection Equipment** Automatic Tank Gauges (ATG) Probes Line Leak Detectors Liquid Sensors Regulation requirements

#### **ATG and Probes**

Check the systems 3<sup>rd</sup> party certification and make sure it is capable of monitoring the planned site

#### www.nwglde.org

- Check job specs
- Ensure the probes have the proper floats for the product being stored
- Take care in programming the system and double check your work

#### **Line Leak Detectors**

Mechanical must be able to detection
 3.0gal/hr release at 10psi.



 Electronic capable of performing at 3.0/gal/hr, 0.2/gal/hr, and sometimes 0.1gal./hr releases (not all ELLD's can perform the 0.1 test)

#### **Liquid Sensors**

- Liquid sump sensors can be used to meet monthly piping release detection requirements
- Can also be used for tank release detection when placed at the bottom of the tank interstice
- Must be tested annually when being used as form of piping release detection
- Should be within 1" of the lowest point of the sump bottom
- Depending on the sensor it can detect either just water or be able to differentiate between water and product

## **Liquid Sensors**









#### Dispensers

Plan your piping runs properly per dispenser type
 Mistakes on A/B sides can be costly
 Shear valve mounting height, +/- 1/2" from plane of island top.

### **Hoses & Nozzles**

Breakaway devices are required on all hoses dispensing Class I & II fuels

- Nozzles can be with or without a hold open latch per L&I, but check with local fire codes
- Swivels are not required but reduce stress on hose
- Hose should not be so long that it rests on ground. (L&I regulation)

#### Vapor Recovery Equipment Stage I – Recovery of vapors from the UST to the delivery vehicle

#### Dry Break 2-point connection Poppet and cap over dry break must seal tightly Coaxial connection Inner drop tube must be maintained in good condition i.e... not bent at top and

fill cap must seal tightly

Aboveground vent riser must be steel

EPA air quality regulation require pressure vent header to be CARB approved

#### Vapor Recovery Equipment Stage II – Recovery of vapors from the customer's vehicle to the UST

- Stage II piping is no longer required to be installed at new locations
- Existing stations with stage II piping must maintain the system per existing regulations

Stations can decommission stage II site by following DEP guidance documents (required UMX certification)

#### **Monitoring/Observation Wells**







- Observation wells are found in the tank field and are installed to a depth of 2' below tank bottom
- Monitoring wells are typically used for ground water monitoring and are found outside the tank excavation. Depth is determined by depth to ground water

#### **Highlights from Module 10**

- Be familiar with all of the components being installed and their purpose
- All newly installed tanks and piping must be double wall
- All newly installed sumps and spill containment must be tested
- Pressurized piping systems must have release detection capable of positive shutdown
- Aboveground vent riser must be made of steel

## Module 11 Release Detection

#### Release Detection Regulation Requirements

#### <u>Tank</u>

- 0.2gal/hr monthly test or Interstitial monitoring
- Interstitial monitoring is required on all USTs installed after November 10, 2007
- Release detection equipment must be tested annually

#### Pressurized Piping

- 0.2gal/hr monthly test or 0.1gal/hr annual test
- 3.0gal/hr continuous
- Lines installed after 11/10/2007 must use interstitial monitoring for either one or both forms of LRD
- Release detection equipment must be tested annually
- Pressurized piping installed after Nov 10, 2007 must have positive shutdown on the 3.0gal/hr method

#### Release Detection Regulation Requirements

American Suction Style Piping (check valve at both ends) Tightness test every three years Or

Monthly monitoring of containment sumps at both ends European or Safe Suction Style (check valve at dispenser end only) None currently required

#### What were they thinking???

- Soil vapor monitoring and ground water monitoring are still valid forms of tank release detection
- Must meet certain technical criteria
- Must be designed by an engineer on a per site basis
- Expensive and operates on the principal that by the time the system alarms, it is too late

#### **Emergency Generators**





Prior to the 2018 regulations, tank and piping release detection was not required on USTs used SOLELY as emergency generators. This exemption has been removed and we are past the last date of the phase in schedule:

Install Date:	On or Before	After	After
	11/10/2007	11/10/2007	12/22/2018
RD Required:	No Later Than 12/21/2020	No Later Than 12/21/2019	At Installation

#### **Highlights from Module 11**

- When using tank gauging as your primary form of release detection, the minimum leak rate is 0.2 gph
- Generator tanks are exempt from positive shutdown for pressurized lines
- A European check valve system has a single check valve, located at the dispenser and is exempt from line release detection

## **Video Presentation EPA - Doing It Right**

Module 12 Cathodic Protection Systems

#### **Cathodic Protection**

- Managing the flow and direction of the current controls corrosion
- Must be tested every 3 years
- New installations and repaired/upgraded systems need tested within 6 months of the installation and every 3 years thereafter
- Rectifiers on impressed current systems must be monitored and the volt & amp meters must be logged every 60 days

#### **Galvanic vs. Impressed Current**

- Galvanic: Uses the difference in energy levels between steel tank and zinc or magnesium anodes to create current flow. Magnesium has the highest electrode potential. (These are typically factory installed systems)
- Impressed Current: Uses an outside power source to create current flow. Anodes are typically graphite. (Impressed current system are designed by a corrosion engineer/expert)

### **Galvanic System**

Always inspect cathodically protected tanks prior to installation for small coating flaws, also called holidays.











st

the sti-Ps

#### Galvanic Protection Sacrificial System

- A sacrificial anode system protects steel by managing the flow of electrical currents from the equipment
- The sacrificial anodes are attached to the component that is to be protected
- Electrons exit the <u>system</u> through the anode
  The anode corrodes instead of the tank

# Schematic of impressed current system for cathodic protection



#### **Cathodic Protection Upgrades/Repairs**

- An approved method must be following when adding supplemental protection to a UST, it may be wise to hire a subcontractor to perform the site survey and spec out the anodes
- UMX certification is needed to make the connection and to complete the modification report
- Site survey is not needed to connect anodes to a flex hose





## **Highlights from Module 12**

- Cathodic protection needs tested within 6 months of installation and every 3 years thereafter
- Small coating flaws are known as holidays
- Galvanic uses a difference in potential while impressed current is powered
- The structure that is being protected should always be attached to the negative lead in an impressed current system
- The most common material for impressed current system anodes is graphite
- Magnesium anodes have the highest electrode potential

#### 2015 EPA Regulations PADEP Adoption Date: 12/22/2018 Notable Changes:

- Quite a few definition changes 245.1
- Added 'change-in-service' to the list of Tank Handling Activities 245.1
- Passing exam score from Plut Exams is good for 2 years 245.105(f)
- Changes to how/when an owner/operator is required to make notification of contamination/suspected release 245.304(c) & 245.305(i)
- Significant changes in the regulations pertaining to owner/operator requirements 245.432 – 245.438
- Phase in schedule for required testing 245.437
  - Tank systems installed on or before 12/22/2018, have 1 year before requirement, then;
  - Due date based on FOI due date but no later than December 21, 2021, whichever comes first.
  - Tank systems installed after 12/22/2018 at installation

2015 EPA Regulations PADEP Adoption Date: 12/22/2018 Full set of the new regulation and the PADEP summary of changes are on the thumb drive



"Your one stop source for <u>all</u> your fuel facility needs."

Home About Regulations Forms Services Contact Links

#### Regulations

The following links are to copies of the PA State Regulations pertaining to fuel dispensing facilities. They are fully searchable using the Ctrl-F keystroke combination. Some may not be applicable to your particular facility. Please keep in mind that other regulations, such as NFPA and other PA adopted building codes may also apply to your site, but we are not able to provide copies as these codes carry copyright restrictions.

PA Chapter 245 (2018 DEP UST regulations)

PA Chapter 245 (2018 DEP UST regulations summary)

PA Title 34 (L&I regulations)

PA Chapter 41 (Weights & Measures regulations)

WV Chapter 22 - Article 17 (UST Law)

WV Title 33 - Series 30 (UST Rule)

WV Chapter 47 - Article 10 (Weight & Measures regulations)



office (717) 697-1651 fax (717) 697-8591

Keystone Petroleum equipment strives to maintain our position as the leading full service petroleum contractor in the PA/MD/VA tri-state area.

<u>Home | About | Contact | Information Links | Forms | Regulations | Services</u> Copyright © 2014 - Keystone Petroleum Equipment All Rights Reserved.

#### **Questions Before the Test**

