



THE PREMIER PROVIDER OF ENVIRONMENTAL SOLUTIONS

# Storage Tank Fusion

## USTs in SPCC Plans ASTs Regulated Like USTs



Robert J May PE  
Senior Professional  
PADEP Storage Tank Advisory Committee (STAC)  
Public Member  
Committee- Chairperson



# USTs in SPCC Plans

## Spill Prevention Countermeasure and Control

- USEPA requirement for total oil storage in containers greater than 55 gallons with an aggregate aboveground oil capacity greater than 1320 US gallons OR an aggregate completely buried (UST) oil capacity of greater than 42,000 gallons
- Spill Prevention Countermeasure and Control (SPCC) plan required.
  - 40 CFR Part 112 – Oil Pollution Prevention
- Many retail motor fuel locations are exempt from SPCC rules
  - Buried storage tanks subject to all the technical requirements 40 CFR Part 280 or Part 281 are exempt.
    - Regulated USTs are those exempted/excluded tanks
    - USTs that are not SPCC exempt (non-residential heating oil) with an oil capacity of greater than 55 US gallons and greater, at facilities where either capacity threshold is exceeded ARE regulated.

# Typical UST Location



# ASTs at Retail Motor Fuel Locations



# ASTs at Retail Motor Fuel Locations (continued)



# ASTs at UST Commercial Facilities



# ASTs at a Dairy with UST Transport Refueling



# SPCC Plan Applicability

- USEPA has a specific definition of oil:
  - “...oil of any kind or in any form...”
  - Petroleum and nonpetroleum oil
  - Synthesized or Synthetic oils
  - Alcohols denatured with oil
  - Biodiesel (B100) and biodiesel blends (Bxx)
  - Containers of oil and water mixtures
  - Includes vegetable oil and animal fats
    - Milk is now specifically excluded (milk has 3% fat)



# Not All ASTs Require a SPC Plan

- ASTs that are exclusively used as “breakout” tanks connected to pipelines regulated by the US Department of Transportation (DOT) under the Pipeline and Hazardous Materials Safety Administration (PHMSA).
- ASTs used exclusively for wastewater treatment
  - Only flow thru portions of the treatment-not all ASTs at the facility



# Other Applicability

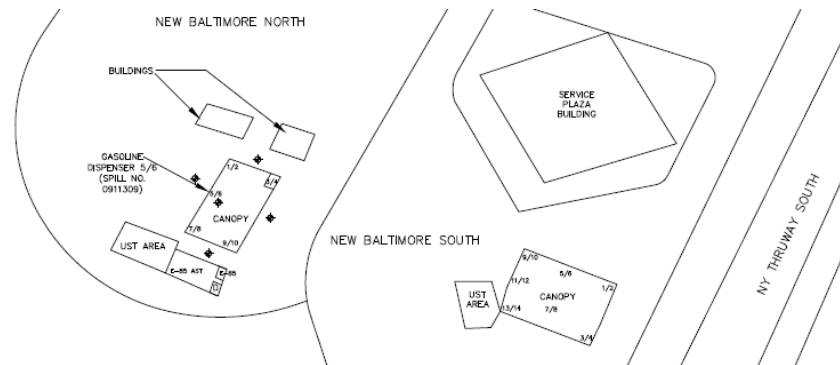
- Home heating oil truck that makes deliveries parking overnight but still storing oil
  - That facility with the parking requires a SPCC plan

# Spill Prevention Countermeasure and Control (SPCC) plan

- If total aboveground oil storage capacity is less than or equal to 10,000 US gallons, and has a clean spill history<sup>1</sup>, looking back three years, the owner/operator has the option to self-certify.

<sup>1</sup> no reportable oil discharges greater than 1,000 gallons or two reportable oil discharges greater than 42 gallons in a rolling 12-month period

- No self-certification in Missouri, only a Professional Engineer (PE) can certify any SPCC plan
- For most facilities with an aggregate oil storage greater than 10,000 gallons, Professional Engineer (PE) must certify plan
- Location of USTs must be on the SPCC figure of oil storage



# Oil Storage and Use

- SPCC plans include all types of oil containers (storage tanks and drums). A Storage tank is referenced as a bulk container
- Oil filled equipment (while not bulk storage, does count to overall facility threshold)
  - Oil filled equipment (electrical transformers)
  - Oil filled operational equipment (equipment gear boxes)
  - Oil filled manufacturing equipment (heat exchanger)
- Bulk storage
  - Oil (motor fuels) tank on Generators (Gensets)
  - Tanks, drums IBCs, certain refuelers



# Spill Prevention Control and Countermeasure (SPCC) Plan Updates

- All SPCC plans now require the ASTs to have integrity inspections and testing interval schedule
- Large Aboveground Storage Tanks (ASTs)
  - Field erected – typically API 650 Standard (atmospheric pressure)
    - Industry standard API 653 Inspections and certified inspectors
- Manufacturer (shop) built ASTs
  - Steel Tank Institute (STI)
    - STI SP001 Inspection standard
      - Table 5.5 Table of Inspection Schedules

# AST Types

## Manufactured type AST



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STANDARD FOR THE INSPECTION  
OF ABOVEGROUND STORAGE TANKS

SP001

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JANUARY 2018  
6<sup>TH</sup> EDITION

## API 650 type field constructed AST



**Tank Inspection, Repair, Alteration,  
and Reconstruction**

API STANDARD 653  
FIFTH EDITION, NOVEMBER 2014

AST Piping Inspection  
API Standard 570  
Fourth Edition February 2016

# STI SP001

## STI Reproduction Permission

TABLE 5.5 TABLE OF INSPECTION SCHEDULES

AST Type and Capacity in U.S. gallons (liters)		Category 1	Category 2	Category 3
Shop-Fabricated ASTs	0 – 1100 (0-4164 liters)	P	P	P, E&L(10)
	1101 - 5,000 (4168-18,927 liters)	P	P, E&L(10)	[P, E&L(5), I(10)] or [P, L(2), E(5)]
	5,001 - 30,000 (18,931-113,562 liters)	P, E(20)	[P, E(10), I(20)] or [P, E(5), L(10)]	[P, E&L(5), I(10)] or [P, L(1), E(5)]
	30,001 - 75,000 (113,566-283,906 liters)	P, E(20)	P, E&L(5), I(15)	P, E&L(5), I(10)
Portable Containers		P	P	P**

\*\* Owner shall either discontinue use of portable container for storage or have the portable container DOT (Department of Transportation) tested and recertified per the following schedule (refer to Section 9.0):

Plastic portable container - every 7 years

Steel portable container - every 12 years

Stainless Steel portable container - every 17 years

Category 1 -ASTs with spill control and CRDM

Category 2 -ASTs with spill control and without CRDM

Category 3 -ASTs without spill control

CRDM -Continuous release detection method

P -Periodic inspection by owner

E -Formal External Inspection by Certified Inspector

I -Formal Internal Inspection by Certified Inspector

L -Leak test by owner

Numbers in parentheses is maximum inspection interval in years

# Monthly AST Inspections

- Monthly AST inspections are required under several regulations
  - National Fire Protection Code (NFPA) 30 Flammable and Combustible Liquid Code
    - Industry Standards referenced API 653 and STI SP001- routine visual inspection
  - SPCC self certified plans (Industry Standards)
  - SPCC plans certified by a PE (Industry Standards and good engineering practices)
  - Person doing the inspection must be trained in storage tank features
    - UST locations could use the Class C operator
    - Primary observations for leak detection and safety devices (vents) to determine if operable
  - Some states regulate ASTs, and those regulations reference a monthly inspection.
  - Pennsylvania requires a 72 hours visual inspection for leaks and water in the containment area.

STI SP001 Monthly Inspection Checklist

General Inspection Information:

Inspection Date: _____	Prior Inspection Date: _____	Retain until date: _____
Inspector Name (print): _____	Title: _____	
Inspector's Signature _____		
Tank(s) Inspected ID: _____		
Regulatory facility name and ID number (if applicable): _____		

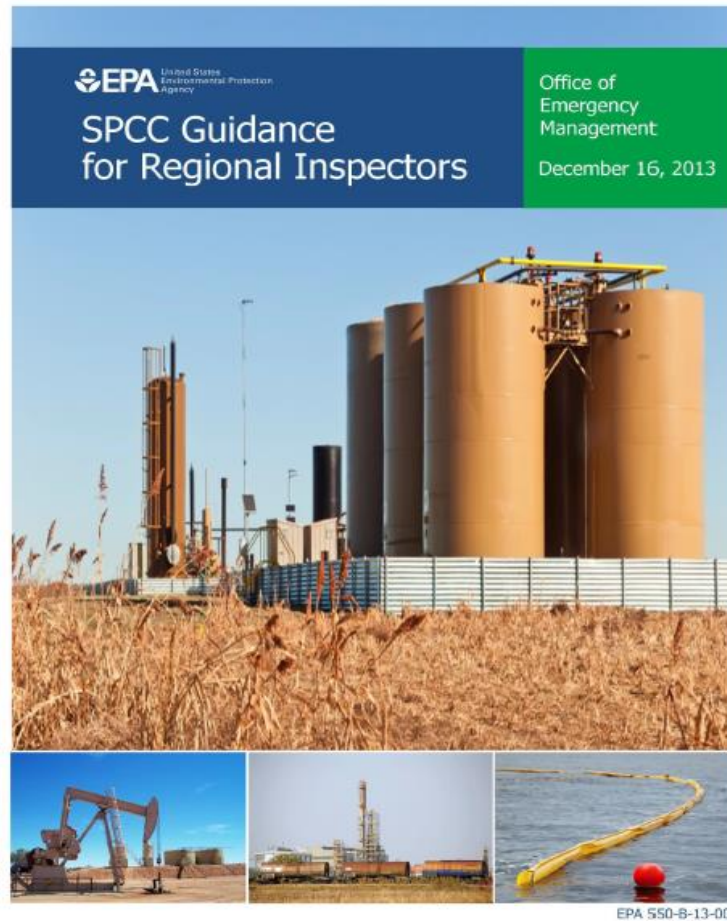
- Inspection Guidance:
- > This checklist is intended as a model. Locally developed checklists are acceptable as long as they are substantially equivalent (as applicable). Inspections of multiple tanks may be captured on one form as long as the tanks are substantially the same.
  - > For equipment not included in this Standard, follow the manufacturer recommended inspection/testing schedules and procedures.
  - > The period: AST inspection is intended for monitoring the external AST condition and its containment structure. This visual inspection does not require a Certified Inspector. It shall be performed by an owner's inspector per paragraph 4.1.2 of the standard.
  - > Upon discovery of water in the primary tank, secondary containment area, interstice, or spill container, remove promptly or take other corrective action. Inspect the liquid for regulated products or other contaminants and dispose of properly.
  - > Non-conforming items **impairing to tank or containment integrity** require evaluation by an engineer experienced in AST design, a Certified Inspector, or a tank manufacturer who will determine the corrective action. Note the non-conformance and corresponding corrective action in the comment section.
  - > Retain the completed checklist for at least 36 months.
  - > After severe weather (snow, ice, wind storms) or maintenance (such as coating) that could affect the operation of critical components (normal and emergency vents, valves), an inspection of these components is required as soon as the equipment is safely accessible after the event.

ITEM	STATUS	COMMENTS / DATE CORRECTED
Tank and Piping		
1	Is tank exterior (roof, shell, heads, bottom, connections, fittings, valves, etc.) free of visible leaks? <i>Note: If "No", identify leak and describe leak and actions taken:</i>	<input type="checkbox"/> YES <input type="checkbox"/> NO
2	Is the tank liquid level gauge legible and in good working condition?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A
3	Is the area around the tank (concrete surfaces, ground, containment, etc.) free of visible signs of leakage?	<input type="checkbox"/> YES <input type="checkbox"/> NO
4	Is the primary tank free of water or has another preventative measure been taken? <small>NOTE: Refer to paragraphs 6.10 and 6.11 of the standard for alternatives for Category 1</small>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A



# SPCC Guidance

<https://www.epa.gov/oil-spills-prevention-and-preparedness-regulations/spcc-guidance-regional-inspectors>



911 pages

# Transfer Areas and General Containment

## Chapter 4 Secondary Containment and Impracticability

### 4.1 Introduction

The purpose of the SPCC rule is to prevent discharges of oil into navigable waters of the United States and adjoining shorelines. One of the primary ways the rule sets out to accomplish this goal is by requiring secondary containment. A secondary containment system provides an essential line of defense in the event of a failure of the primary containment, such as a bulk storage container, a mobile or portable container, piping, or oil-filled equipment. The system provides temporary containment of discharged oil until the appropriate actions are taken to abate the source of the discharge and remove oil from areas where it has accumulated to prevent it from reaching navigable waters or adjoining shorelines. The rule includes two categories of secondary containment requirements:

- A **general provision** addresses the potential for oil discharges from all regulated parts of a facility. The containment method, design, and capacity are determined by good engineering practice to contain the most likely discharge of oil until cleanup occurs.
- **Specific provisions** address the potential of oil discharges from areas of a facility where oil is stored or handled. The containment design, sizing, and freeboard requirements are specified by the SPCC rule to address a major container failure.

The *general* secondary containment requirements are intended to address, in accordance with good engineering practice, the most likely oil discharges from areas or containers such as mobile refuelers and other non-transportation-related tank trucks; oil-filled operational or process equipment; (non-rack) transfer areas; or piping. In determining the method, design, and capacity for general secondary containment, only the typical failure mode needs to be considered.

The *specific* secondary containment requirements are intended to address a major container failure (e.g., the entire contents of the container and/or compartment) associated with a bulk storage container; single compartment of a tank car or tank truck at a loading/unloading rack; mobile/portable containers; and production tank batteries, treatment, and separation installations (including flow-through process vessels and produced water containers). These specific provisions (see *Table 4-1* in *Section 4.1.1*) provide explicit requirements for sizing, design, and freeboard.

The purpose of this chapter is to clarify the relationships among the various general and specific secondary containment requirements of the SPCC rule, and to illustrate how these requirements apply. This chapter also discusses the rule's impracticability determination provision, which may be used when a facility owner/operator cannot install secondary containment by any reasonable method. The additional requirements that accompany an impracticability determination, the documentation needed to support such a determination,

# Oil Transfer Areas

- Dispensers and tank fill ports are transfer areas
- UST transfer areas at SPCC plan locations are subject to the containment requirements in Chapter 112.7(c) even if the UST is exempt at an otherwise regulated SPCC facility
  - Most fuel retailers are not otherwise regulated unless they have ASTs
- Areas where oil is transferred but no loading or unloading rack present regulated under 112.7(c)



# Loading and Unloading Racks

- Areas where oil is transferred and a loading or unloading rack is present regulated under 112.7 and 112.7(h)
- 112.7(h) has sized containment and other specific requirements for loading and unloading racks.



# General Secondary Containment

- General Secondary containment may be passive or active
  - Passive containment includes dikes for containment or diversionary structures (remote impounding)
    - Containment must be sized based on good engineering practice



- Active containment includes response actions, sorbent deployment



SPCC 40 CFR Part 112  
Lets Get Into the Weeds



Mark W. Howard  
Office of Emergency Management - HQ

SPCC Short Course  
March 26, 2018  
NISTM

# Revision to General Secondary Containment Requirement

This revision:

- Clarifies that the general secondary containment requirement is intended to address the *most likely oil discharge* from any part of a facility

New text: "... In determining the method, design, and capacity for secondary containment, you need only to address the typical failure mode, and the most likely quantity of oil that would be discharged. Secondary containment may be either active or passive in design."

- Modifies §112.7(c) to expand the list of example prevention systems for onshore facilities
  - Additional examples: drip pans, sumps, and collection systems



SPCC 40 CFR Part 112  
Lets Get Into the Weeds



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Office of Emergency Management - HQ

SPCC Short Course  
March 26, 2018  
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# General Secondary Containment Requirement

- Requires secondary containment for all areas with the potential for a discharge
- Requires appropriate containment and/or diversionary structures to prevent a discharge that may be harmful (a discharge as described in §112.1(b))
- This is the **minimum** expectation for containment
  - General facility requirement with no sizing or freeboard requirements



# Example Methods of Secondary Containment listed in §112.7(c)

## Examples include:

- Dikes, berms, or retaining walls
- Curbing
- Culverting, gutters, or other drainage systems
- Weirs
- Booms
- Barriers
- Spill diversion ponds and retention ponds
- Sorbent materials
- Drip pans
- Sumps and collection systems





SPCC 40 CFR Part 112  
Lets Get Into the Weeds



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# Active or Passive

- The revision clarifies that the use of both active and passive secondary containment measures is allowed.
- Active containment measures are those that require deployment or other specific action by the operator.
  - These may be deployed either before an activity involving the handling of oil starts, or in reaction to a discharge.
- Passive measures are permanent installations and do not require deployment or action by the owner or operator.

SPCC 40 CFR Part 112  
Lets Get Into the Weeds



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## Active Measures vs. Contingency Plan

- **Active secondary containment** requires a deployment action; it is put in place prior to or immediately upon discovery of an oil discharge
  - The purpose of these measures is to contain an oil discharge **before it reaches** navigable waters or adjoining shorelines
- **A contingency plan** is a detailed oil spill response plan developed when any form of secondary containment is determined to be impracticable
  - The purpose of a contingency plan should be both to outline response capability or countermeasures to limit the quantity of a discharge reaching navigable waters or adjoining shorelines, and to address response to a discharge of oil that **has reached** navigable waters or adjoining shorelines

# Near Future Issues

- Electric vehicle (EV) charging at UST locations
  - Electrical transformer- oil cooled (140 gallons)
  - EV vehicle chargers may be oil cooled
  - Latest generation of EV charger cables are liquid cooled (oil or glycol)

FOR USE WITH ELECTRIC VEHICLES (DESTINÉ À ÊTRE UTILISÉ POUR DES VÉHICULES ÉLECTRIQUES)  
**VENTILATION NOT REQUIRED**

CHARGER, 387 kVA @ 480VAC, 4 OUTPUT  
 P1450798-00-SGF2213150004TF

Date of Manufacture: NOVEMBER 2021

Charger Type	Isolated	Protective Class	Class I
Ingress Protection (Cabinet/Cooling)	IP66 / IP2x	Enclosure Type	Type 3R / IP66
Operating Temperature Range	-30°C to +50°C		

AC Input		POST DC Output	
Volts Nominal	380/400/415/440/480V 3 Phase	Output Power	250 kW
Voltage Range	360-520V	Output Voltage Range	0-500V
Max Continuous Current	425 A	Output Current	51 A
Frequency	50/60 Hz	CONFORMS TO UL STD 2202 CERTIFIED TO CSA STD C22.2 #107.1 COMPLIES TO IEC 61851-1	
Maximum Continuous Power	387 kVA @ 480V	This device complies with Part 65 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.	
Short Circuit Current Rating	85kA		

DC Input / Output	
Input Power	575kW
Voltage Range	840-1000V
Max Input Current	640A

**CAUTIONS:** RISK OF ELECTRIC SHOCK. DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE.  
 MISE EN GARDE: PLUSIEURS CIRCUITS ALIMENTÉS PAR PLUSIEURS CIRCUITS SOUS TENSION. COUPER TOUTES LES SOURCES D'ALIMENTATION AVANT DE FAIRE L'ENTRETIEN ET LES RÉPARATIONS. NE PAS UTILISER CE MATÉRIEL S'IL EST ENDOMMAGÉ. CET APPAREIL EST CONÇU POUR RECHARGER DES VÉHICULES NE NÉCESSITANT PAS UNE VENTILATION DURANT LA RECHARGE.

**ATTENTION:** RISQUE DE CHOC ÉLECTRIQUE. NE PAS RETIRER LE COUVERCLE. NE CONTIENT AUCUNE PIÈCE POUVANT ÊTRE RÉPARÉE PAR L'UTILISATEUR.  
 AVERTISSEMENTS: CET APPAREIL EST ALIMENTÉ PAR PLUSIEURS CIRCUITS SOUS TENSION. COUPER TOUTES LES SOURCES D'ALIMENTATION AVANT DE FAIRE L'ENTRETIEN ET LES RÉPARATIONS. NE PAS UTILISER CE MATÉRIEL S'IL EST ENDOMMAGÉ. CET APPAREIL EST CONÇU POUR RECHARGER DES VÉHICULES NE NÉCESSITANT PAS UNE VENTILATION DURANT LA RECHARGE.

**ÉNERGIE STOCKÉE DANS UN CONDENSATEUR. ATTENDRE 5 MINUTES APRÈS LA MISE HORS TENSION DE L'ÉQUIPEMENT AVANT D'OUVRIR LA PORTE.  
 L'ENTRETIEN DOIT ÊTRE EFFECTUÉ PAR DU PERSONNEL QUALIFIÉ.**

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APPROX. WEIGHT	
CORE & COIL (UNTANKING)	1428 LB.
TANK & FIT	1255 LB
FLUID : OIL (GALLONS)	1046 LB
TOTAL WTCT.	3728 LB



# ASTs Regulated Like USTs

- Noted similarities with ASTs and USTs
  - Monthly walk around inspection
    - Method of leak detection-visual
    - Review equipment and general conditions



# Pennsylvania Storage Tank Regulations

- 1989 The Storage Tank and Spill Prevention Act
  - 1988 Ashland Oil 3.5 Million Gallon diesel AST failure
  - Nearly 1 million gallon spill into the Monongahela River near Jefferson Hills PA
    - 20 miles upstream from downtown Pittsburgh PA
  - Affected drinking water source for about 1 million people in OH, WV, KY, and PA for 200 miles down the Ohio River
- After 1988 event, industry standards such as API-653 Inspection guidance was formulated (January 1991)



# PA Underground Storage Tank Indemnification Program (USTIF)

- Fund created in 1994 to make claim payments for corrective actions and third party claims to or on behalf of UST owners or operators for a release occurring after February 01, 1994
- USTIF was a mandatory program
  - Optional for unregulated heating oil USTs
- Per gallon fee collected by supplier (distributor) which was passed onto the public consumer at the pump
- Initial funding rates was 2¢ per gallon delivered.
  - Diesel and kerosene fuel annual per capacity charge of 1.5¢/gal
- Deductible of \$5,000 per tank for \$1.5 million coverage

# Motor Fuel Retailer Owner Business Plan

- In 1994, a good business volume for motor fuel retailer was approximately 100,000 gallons of fuel per month
  - Monthly USTIF fee \$2,000
    - Annual USTIF fee \$24,000
- Savvy UST owners knew adjoining states like New Jersey and New York had no fund.
- UST owners in NJ and NY purchased UST insurance from companies like Zurich, ACE, and Chubb
  - Annual tank insurance premium less than \$24,000 annually



# Alternate to USTs-ASTs in Vaults

- UST owners and installers developed a scenario where a shop built AST could be installed in a concrete vault
- Fire code regulations were revised allowing ASTs at retail motor fuel locations
  - The vault protected the environment as secondary containment
  - Single wall AST could be installed
  - AST owner exempt from USTIF
  - Motor fuel retailer would still charge the public the neighborhood UST motor fuel retailer price
    - Instant profit of 2¢ per gallon
    - Approximate \$24,000 annual profit
    - **Motor fuel retailer now could buy a bigger, faster, fishing boat**
  - PA has 43 ASTs in vaults at 22 facilities





# ASTs in Vaults in 1989

## Exempted from UST Regulations



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

JUN 25, 1989

OFFICE OF  
SOLID WASTE AND EMERGENCY  
RESPONSE

### MEMORANDUM

SUBJECT: Whether a Concrete Vaulted UST System is Subject to the  
Underground Areas Exclusion

FROM: David O'Brien, Chief /s/  
Standards Branch, OUST (OS-410)

TO: Wayne S.. Naylor, Chief  
Underground Storage Tank Section (3HW31)

This is in response to your July request from Virginia as to whether a precast Concrete vaulted tank system housing a tank below grade is exempt from 40 CFR part 280 requirements. The answer to this request is yes, "if the tank sits upon or above the surface of the floor and there is sufficient space to enable physical inspection of the tank bottom." (53 FR 37121). As explained in the preamble, such tanks, although technically underground, are no different than above ground tanks and are therefore included in the Law's underground areas exclusion.

For your information, we have no authority to withhold this interpretation (which is already provided in the final rule's preamble) from the Virginia Water Control Board contingent upon receiving a certification from a professional engineer to ensure the accuracy of the proposed design's structural integrity. Therefore, we did not review the structural calculations that were provided.

It may be worth pointing that such concrete vaulted system would appear to have to satisfy Virginia Building Codes, aboveground tank fire safety codes (e.g., NFPA 30), and if applicable, SPCC aboveground tank regulations currently under consideration for revision within EPA.

cc: Jim McCormick

# How Much Space for a Visual Inspection in a Vault?

Answer: Tank 6 inches from Vault Wall on 3 Sides and Fourth Side has Room for Human Entry and Inspection

SOIL WASTE AND EMERGENCY  
RESPONSE

Mr. William G. Nowman, President  
Halisco, Inc.  
6601 North Black Canyon Highway  
Phoenix, Arizona 85015

Dear Mr. Nowman:

This responds to your August 21, 1991 letter to Administrator Reilly about your need for clarification of a portion of the Environmental protection Agency's (EPA) underground storage tank (UST) regulations that were promulgated under Subtitle I of the Resource Conservation and Recovery Act as amended. Your question pertains to the way the 40 CFR Part 280 regulations address vaulted tank systems buried in the ground.

Your letter suggests there is a lack of clarity in the UST regulations about how much space is necessary between the tank vessel and the surrounding open vault to allow for physical inspection. This question is important because tanks that can be physically inspected for leaks are considered to be the same as aboveground tanks, and thereby excluded from the UST rules under the "underground areas exclusion" provided in the statutory definition of underground storage tanks. Your general concern is that there are some vaulted tank systems for sale in the market that do not allow complete physical inspection of all sides of the tank vessel because the tank shell is located too close to the side walls of the vault.

In your letter you provided a specific example of a tank that is within six inches of the vault's walls on three sides, but is, set back far enough along the fourth side of the tank to allow room for human entry and inspection. Such a tank system would be considered to be physically inspectable by EPA, and therefore not subject to the Agency's UST regulations under the "underground areas exclusion", if the access provided on the fourth side of the vaulted is sufficient to enable a person to observe evidence of a leak from anywhere on the tank vessel. Thus, if the tank is in a saddle and the bottom of the vault can be viewed, in order to check for evidence of a leak then the tank is considered to be inspectable.

## **STI SP001 first published in 2000**

### STI SP001 7.1.8.1

Visually inspect general condition of containment area...

### STI SP001 7.3.1

Inspect shell plates and welds for indications of exterior corrosion...

# Downside of AST in a Vault

- AST with a capacity greater than 1,320 US gallons requires a USEPA SPCC Plan
  - SPCC plan certified by Professional Engineer (>10,000 gallon aggregate capacity)
    - Risk management for containment with concrete 6-inch thick
  - Leak detection as compared to operating a UST has less requirements
    - Monthly walk around inspections still required
    - Monthly inspections in vault regulated by OSHA for confined space
      - Most motor fuel retailers not aware of OSHA confined space regulations
  - The vault may have sumps (water collection low points)
    - Pumps in the sump must be intrinsically safe for flammable combustible service
    - Sump discharge is problematic and most likely require permits for discharge to surface waters or to a public operated treatment works (POTW)

# Monthly AST in Vault Inspection OSHA Confined Space Entry

- Trained personnel
  - Entry person and outside attendant person
- Atmospheric monitoring
- Remove power sources
  - Stop dispensing fuels
- Confined space rescue and retrieval system
- Typical cost \$800 per event

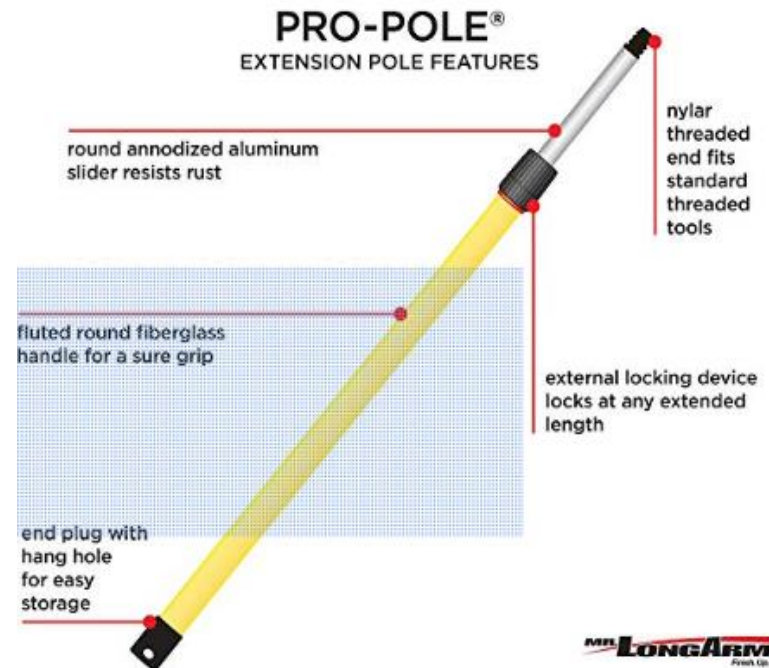
**DANGER**

**DO NOT ENTER  
CONFINED SPACE  
WITHOUT  
ATTENDANT AND  
RESCUE EQUIPMENT  
IN PLACE**



# Compliant Monthly AST in Vault Inspections

- Need 6-18 ft. extendable pole
- GoPro camera in a hazardous location enclosure with remote viewing on an iPhone
- Explosion proof flashlight duct taped to pole



**MR. LONGARM**  
Power Up



# 2018 OSHA Investigation

## Pennsylvania AST in Vault Owner Shop Vacuum Death

### Accident Investigation Summary

Summary Nr: 106477.015

Event: 06/12/2018

Employee Is Killed From Explosion Of Gasoline Vapors, Second

At 5:50 p.m. on June 12, 2018, two employees were removing excess water from underground concrete vault which contained a metal gasoline storage tank for an automobile gasoline station. Employee #1 was using a shop vacuum inside the vault that was not approved for a flammable vapor environment. Employee #2 was on the surface of the parking lot near the manhole entrance of the vault. Gasoline vapors were ignited which caused a large explosion and a fire plume. Employee #1 was entrapped inside the concrete vault and killed from the blast and fire. Employee #2 sustained severe burns to the body and was transported to a hospital.



# PA AST in Vaults Regulated like USTs

## § 245.523. Aboveground storage tanks in underground vaults.

The following requirements shall be met when an owner or operator chooses to install an aboveground storage tank in an underground vault:

(1) The vault shall completely enclose the aboveground storage tank. There may be no openings in the vault enclosure except those necessary for access to, inspection of, and filling, emptying and venting of the tank. The walls and floor of the vault must be constructed of reinforced concrete at least 6 inches thick. The top, walls and floor shall be designed to withstand the anticipated loading, including loading from traffic, soil and groundwater.

(2) The vault must be compatible with the stored substance and have a permeability of less than  $1 \times 10^{-7}$  cm/sec for substance stored and be water tight.

(3) An aboveground storage tank must be in its own vault. Adjacent vaults may share a common wall.

(4) There may be no backfill around the aboveground storage tank and there shall be sufficient space between the tank and the vault to allow inspection of the tank and ancillary equipment.

(5) Vaults and aboveground storage tanks must be suitably anchored to withstand uplifting by either water or released substance, including when the tank is empty.

(6) Connections shall be provided to permit venting of each vault to dilute, disperse and remove vapors prior to personnel entering the vault.

(7) A vault must be equipped with a continuous leak detection system capable of detecting vapors and liquids including water. The detection system must activate an alarm that automatically shuts down the dispensing system if vapors or liquids are detected.

# PA AST in Vault Regulated like USTs

Ch. 245

SPILL PREVENTION PROGRAM

25 § 245.524

(8) A vault must have a means for personnel entry. The entry point must have a warning sign indicating the need for procedures for safe entry into a confined space. An entry point must be secured against unauthorized entry and vandalism.

(9) A suitable means to admit a fire suppression agent shall be provided for each vault.

(10) Aboveground storage tanks and ancillary equipment shall be installed, maintained and inspected in accordance with the requirements for aboveground storage tanks in this subchapter.

(11) Underground piping distribution systems for each aboveground storage tank system used to dispense class I or class II motor fuels for resale must be provided with release detection equivalent to underground piping release detection addressed in § 245.445 (relating to methods of release detection for piping) and monitored as required in paragraph (7) with monitoring records retained for 12 months as required under § 245.516 (relating to recordkeeping requirements).

## Source

The provisions of this § 245.523 amended November 9, 2007, effective November 10, 2007, 37 Pa.B. 5979; amended December 21, 2018, effective December 22, 2018, 48 Pa.B. 7875. Immediately preceding text appears at serial pages (331102) to (331103).



# What about the Pennsylvania 72 Hour Visual Inspection for ASTs?

- PADEP requires a 72 hour visual inspection
- Rational is dike containment water must be removed within 72 hours so the tank should be viewed every 72 hours
  - Inspection for no potential hazardous environmental conditions
    - Evidence of a release
    - Spill
    - Overfill
    - Leakage
    - Water in containment
- Suggest AST in vault owners to print out the vault water and leak sensors status report from the Automatic Tank Monitor (ATM) every other day (48 hours)
  - ATM installed to provide fuel level monitoring for deliveries

# Storage Tank Fusion Summary

- If the UST facility has an AST or non SPCC exempt USTs, the facility may need a SPCC Plan.
- If facility has a SPCC plan, UST deliveries and dispensing must be reviewed in terms of active or passive secondary containment
- ASTs also require a monthly inspection and now must have a formal inspection schedule
  - Typically an industry standard or a risk based schedule.
  - ASTs may not need a formal inspection per Industry Standards (STI) but the state may require formal in-service inspections every 5 years
- ASTs in underground vaults in Pennsylvania must have monthly tank and product line leak detection like a UST
- ASTs in underground vaults in Pennsylvania now have an inspection schedule every 3 years (instead of 10 years) despite UST monthly leak detection in an impervious vault
  - No AST in every other state requires an inspection every 3 years



## **Contact Information**

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