SPCC/APSA Tank Inspections

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Audience Question

What frequency of inspection is required by the SPCC Rule for bulk storage tanks?

- Answer: Specific frequency is not specified in the SPCC Rule.

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Audience Question

- Does this tank require an inspection? (Yes/No/Maybe)

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Audience Question

- Does this tank require an inspection? (Yes/No/Maybe)

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40 CFR 112.7(3): ***Inspections, tests, and records.*** Conduct inspections and tests required by this part in accordance with **written procedures** that you or the certifying engineer develop **for the facility**.

QUIZ – What is the Key requirement for inspections and testing?

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40 CFR 112.8(c)(6): Test or inspect each aboveground container for integrity on a regular schedule and whenever you make material repairs. You must determine, in accordance with **industry standards**, the appropriate qualifications for personnel performing tests and inspections, the frequency and type of testing and inspections.

QUIZ – What is the key phrase above?

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40 CFR 112.12(c)(6)(ii): Bulk storage containers subject to Good Manufacturing Practices, containing food for human consumption (21 CFR part 110), which are elevated, constructed of austenitic stainless steel, have no external insulation, and are shop-fabricated, conduct formal visual inspection on a regular schedule.

Tanks meeting these requirements have relaxed inspections requirements

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Integrity Industry Standards

- Steel Tank Institute (STI)
  - STI SP001 – 6th Edition (January 2018)
- American Petroleum Institute (API)
  - API Std 653 – 5th Edition (November 2014)
- Fiberglass Tank & Pipe Institute
  - RP 2007-1

Any Others?

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Tank Details

- Size/Configuration
  - Shell capacity
  - Construction and design standards
- Tank Components

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Tank Details

- Configuration and design standards

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Tank Category

- Risk Based Classification
  - Category I (least risk)
  - Category II
  - Category III (most risk)
- Higher Risk Installations
  - Higher frequency of inspections
  - Additional types of testing

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Tank Category

Spill Control:

- Remote impounding
- Secondary containment dike/berm
- Open top steel diked AST
- Closed top steel diked AST with overfill Prevention
- Double-wall AST with overfill prevention
- CE-AST with overfill prevention

Continuous Release Detection Methods (CRDM):

- Release prevention barrier (RPB)
- Double-wall AST or double-bottom AST
- Elevated AST, with or without release prevention barrier
- Steel diked AST, open or closed top
- CE-AST with integral secondary containment and interstitial monitor

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Tank Category

- Category I (least risk)
  - Spill control and
  - Continuous Release Detection Methods (CRDM):
- Category II
  - Spill control and
  - NO CRDM
- Category III (most risk)
  - NO Spill control

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Tank Category

STI – Visual and Non-Destructive Container Shell Inspection Requirements			
Container Type	Capacity (Gallons)	AST Category[A]	Inspection Type
Shop Fabricated AST	55 – 1,100	I, II	Visual Inspections by trained Facility Personnel
		III	Non-Destructive Shell Inspection by a Certified Inspector
	1,101 – 5,000	I	Visual Inspections by trained Facility Personnel
		II, III	Non-Destructive Shell Inspection by a Certified Inspector
	5,001 – 50,000	I, II, III	Visual Inspections by trained Facility Personnel and Non-Destructive Shell Inspection by a Certified Inspector
Portable Containers	≥ 55	–	Visual Inspections by trained Facility Personnel

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Audience Question

What things come to mind with the phrase…

"Tank Integrity"

- Thickness
- Tank Testing
- Certified Inspector
- Periodic Inspections

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Tank Inspections

- Tank Owner/Representative
  - Monthly and annual inspections
  - Retain inspections for 3 years
- Certified Tank Inspector
  - External/Internal/Leak Testing
  - Retain for the life of the tank

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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 periodic 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 important 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 checklists 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? **Note**: *If "No", identify tank and describe leak and actions taken.*	□ Yes □ No	
2	Is the tank liquid level gauge legible and in good working condition?	□ Yes □ No □ N/A	
3	Is the area around the tank (concrete surfaces, ground, containment, etc.) free of visible signs of leakage?	□ Yes □ No	

STI SP001 Annual 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).
- For equipment not included in this Standard, follow the manufacturer recommended inspection/testing schedules and procedures.
- The periodic 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.
- Remove promptly standing water or liquid discovered in the primary tank, secondary containment area, interstice, or spill container. Before discharge to the environment, inspect the liquid for regulated products or other contaminants and disposed of it properly.
- In order to comply with EPA SPCC (Spill Prevention, Control and Countermeasure) rules, a facility should regularly test liquid level sensing devices to ensure proper operation (40 CFR 112.8(c)(8)(v)).
- Non-conforming items important 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 checklists for at least 36 months.
- Complete this checklist on an annual basis, supplemental to the owner monthly-performed inspection checklists.
- **Note: If a change has occurred to the tank system or containment that may affect the SPCC plan, the condition should be evaluated against the current plan requirement by a Professional Engineer knowledgeable in SPCC development and implementation.**

	ITEM	STATUS	COMMENTS / DATE CORRECTED
	Tank Foundation/Supports		
1	Free of tank settlement or foundation washout?	☐Yes ☐No	
2	Concrete pad or ring wall free of cracking and spalling?	☐Yes ☐No ☐N/A	

STI SP001 Portable Container Monthly Inspection Checklist

General Inspection Information:

Inspection Date: _____ Prior Inspection Date: _____ Retain until date: _____

Inspector Name (print): _____ Title: _____

Inspector's Signature (): _____

Container(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).
- This periodic Inspection is intended for monitoring the external condition and its containment structure. This visual inspection does not require a Certified Inspector. It shall be performed by an owner's inspector who is familiar with the site and can identify changes and developing problems. Note the non-conformance and corresponding corrective action in the comment section.
- Retain the completed checklists for at least 36 months.

	Item	Area:	Area:	Area:	Area:
	Portable Container Containment/Storage Area				
1	Are all portable container(s) within designated storage area?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
2	Is the containment and storage area free of excess liquid, debris, cracks or fire hazards?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
3	Are drain valves closed and in good working condition?	☐Yes ☐ No ☐N/A	☐Yes ☐ No ☐N/A	☐Yes ☐ No ☐N/A	☐Yes ☐ No ☐N/A
4	Are containment egress pathways clear and any gates/doors operable?	☐Yes ☐ No ☐N/A	☐Yes ☐ No ☐N/A	☐Yes ☐ No ☐N/A	☐Yes ☐ No ☐N/A
	Container				
5	Is the container free of leaks? Note: *If "No", identify container and describe leak.*	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
6	Is the container free of distortions, buckling, denting or bulging?	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No


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Audience Poll #2

Can Underground Storage Tanks (USTs) be used as Aboveground Storage Tanks (ASTs)?

- Yes
- No
- Maybe

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Public Service Announcement

Underground Storage Tanks (USTs) cannot be used as Aboveground Storage Tanks (ASTs)

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California State Fire Marshal
Information Bulletin 14-005

Issued: July 25, 2014

Underground Fuel Storage Tanks Prohibited for Use as Aboveground Fuel Storage Tanks

This information bulletin has been developed to inform and advise the public on the prohibited use of converted steel underground storage tanks (UST) as aboveground storage tanks (AST) storing flammable or combustible liquids.

Section 5704.2.7, California Fire Code, 2013 Edition states, "*The design, fabrication and construction of tanks shall comply with NFPA 30. Each tank shall bear a permanent nameplate or marking indicating the standard used as the basis of design.*" The National Fire Protection Association (NFPA) Standard 30, 2012 Edition, Section 3.3.51.1, defines an aboveground tank as a storage tank that is installed above grade, at grade, or below grade without backfill. NFPA 30 Section 21.3.4 states, "Tanks designed and intended for underground use shall not be used as aboveground tanks."

The design, construction, and installation standards of USTs are different than ASTs. Since the core structure of the USTs is designed for an underground placement, it is difficult, dangerous and costly to convert USTs for aboveground placement. For example, tank heads of a UST lack the reinforcement necessary to support the heads if converted into an AST. The soil around a UST provides additional structural support and, therefore, no additional reinforcement is necessary. However, an AST requires larger tank heads to be reinforced with structural steel to stiffen and strengthen the heads.

It is vitally important to recognize the proper installation, maintenance and inspection of ASTs. Tanks which are not listed by industry standards or approved by fire code officials, specifically for aboveground flammable or combustible liquid storage, pose a significant danger and safety threat to owners, operators and others working around these tanks.
See references at the end of this bulletin.

If you have questions regarding this Informational Bulletin, please contact Senior Environmental Scientist Denise Gibson at denise.gibson@fire.ca.gov or (916) 445-8289.

Steel Tank Institute

Tank Talk, February 2014

Ask the experts

Repurposing underground tanks as aboveground tanks: A dangerous game

On December 11, 2013, one person died and two were injured in Merced County, California, when a farm tank exploded during welding operations.

The tank was approximately 500 gallons capacity, had two 1.5" diameter vents, capped with a tee fitting and elbows that pointed vent discharge downward toward the tank shell. A dedicated emergency vent was not provided. The vent pipes that were present were not equipped with flame arrestors or pressure vacuum vents, although this does not appear to have been a factor in the incident that occurred. The tank had reportedly previously contained a Class 2 liquid, such as diesel fuel, and was not compliant with UL 142.

"Damaged tank from explosion: Tank ends are bowed outward. No emergency venting evident. Small grinder with wire brush wheel nearby."—Hank Moore, Merced County Fire Marshal

The feedback that we received from industry experts is a reminder of the importance of proper pre-

cause a dedicated emergency vent had not been provided. Merced County Fire Marshal Hank Moore, who investigated this incident, contacted Wayne Geyer at STI/SPFA, and he in turn sought the opinion of several experts in the field.

ing torch penetrated the steel shell. The contractor didn't take adequate precautions because he was dealing with motor oil, which he thought was "safe" because of its high flashpoint and because the U.S. Department of Transportation doesn't require a

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Any issues with these tanks?

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This happens when you don't properly vent a storage tank
https://www.youtube.com/watch?v=2WJVHtF8GwI

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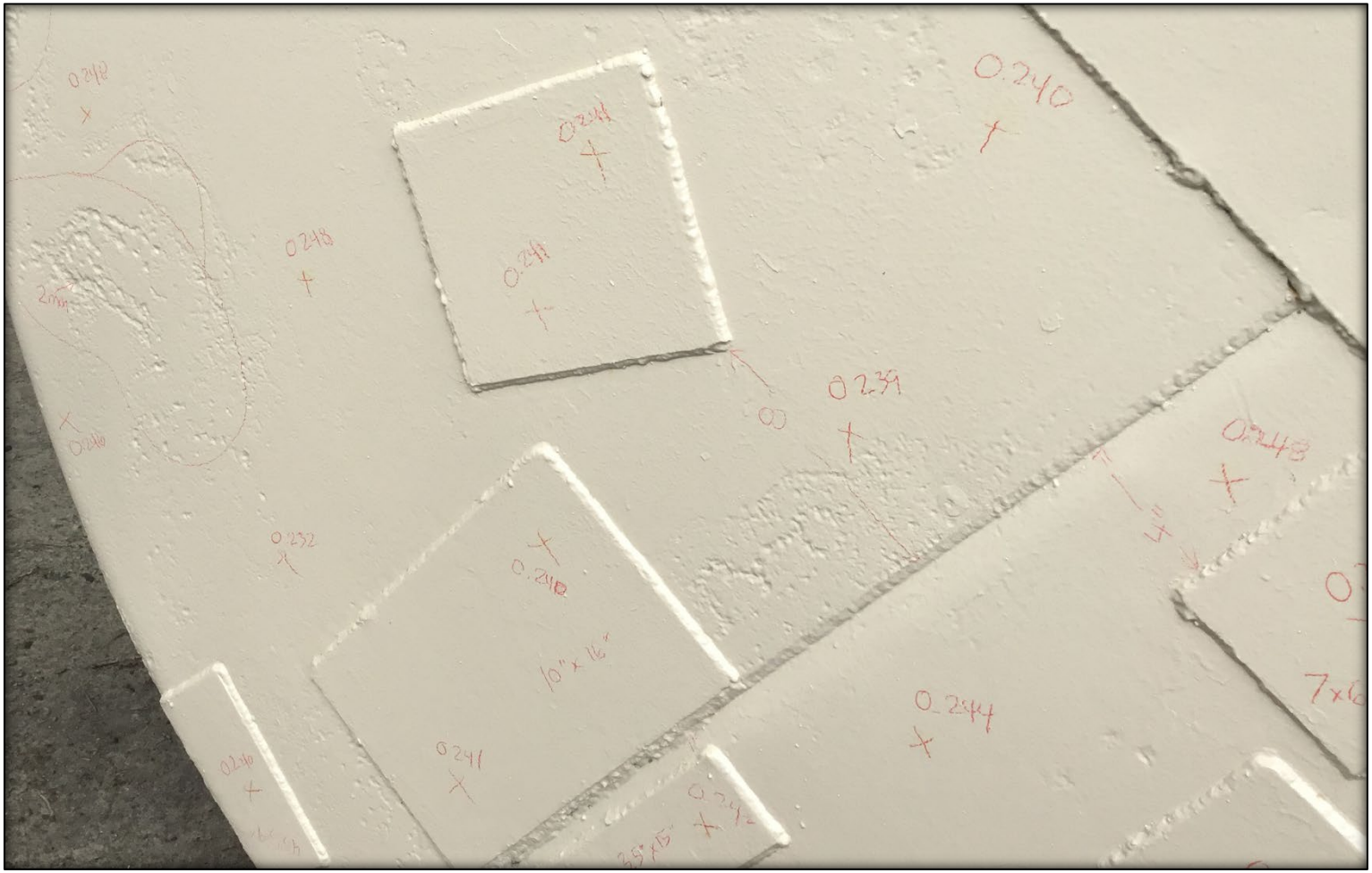

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Any issues with this tank?

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Any issues with this tank?

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Any issues with this tank equipment?

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Texas Tank Explosion Close Call Caught on Tape

Let's see that in an instant replay…

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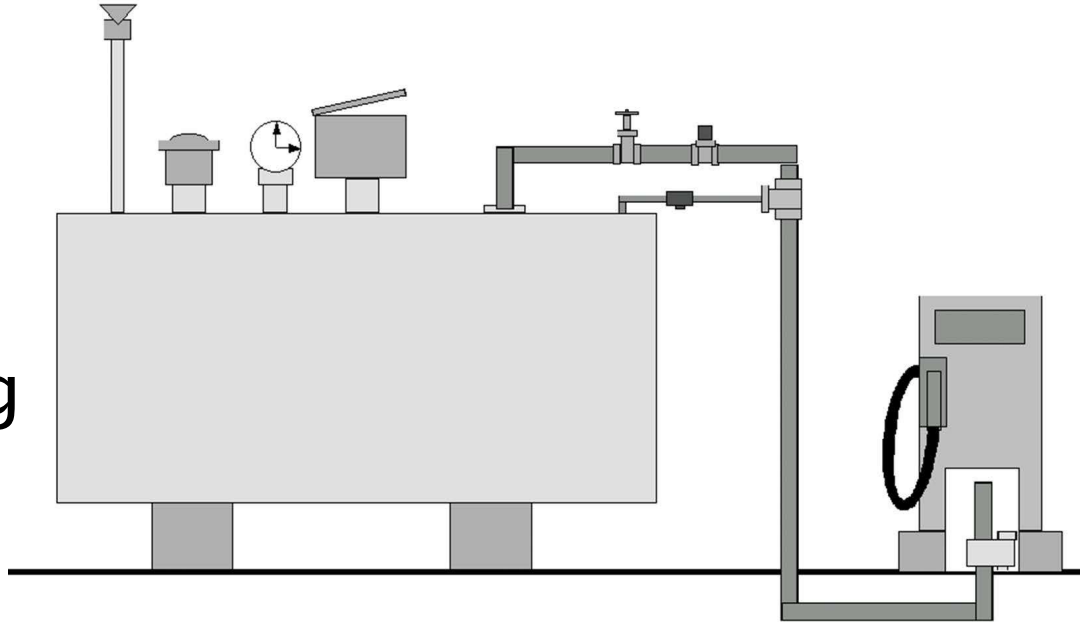
Common Findings

- Undersized normal vent
- Lack of emergency venting
- Evidence of overfilling and lack of overfill prevention
- Fitting leaks
- Missing labels
- Poor housekeeping



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Integrity Inspection Summary

- Maintain tanks for longevity, safety and promptly address deficiencies
  - Tanks and equipment should be suitable for the intended use and compatible with materials stored.
  - Aboveground tanks containing flammable and combustible liquids require both normal and emergency venting
  - Tanks should be free of paint failure, rust, dents, bulges and leaks
  - Vents should move freely and be free of debris
  - Secondary containment should be clean and dry; free of water, oils, and debris

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Integrity Inspection Summary

- Choose the inspection standard based on the tank design and construction
- Document the inspection standard in your SPCC Plan
- Utilize STI SP001checklists or equivalent for routine monthly and annual inspections, if applicable
- Conduct integrity inspections and retain records

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Questions?

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