



Tank Inspections Based on Risk to the Environment

Dana Schmidt PE
Steel Tank Institute
STI/SPFA

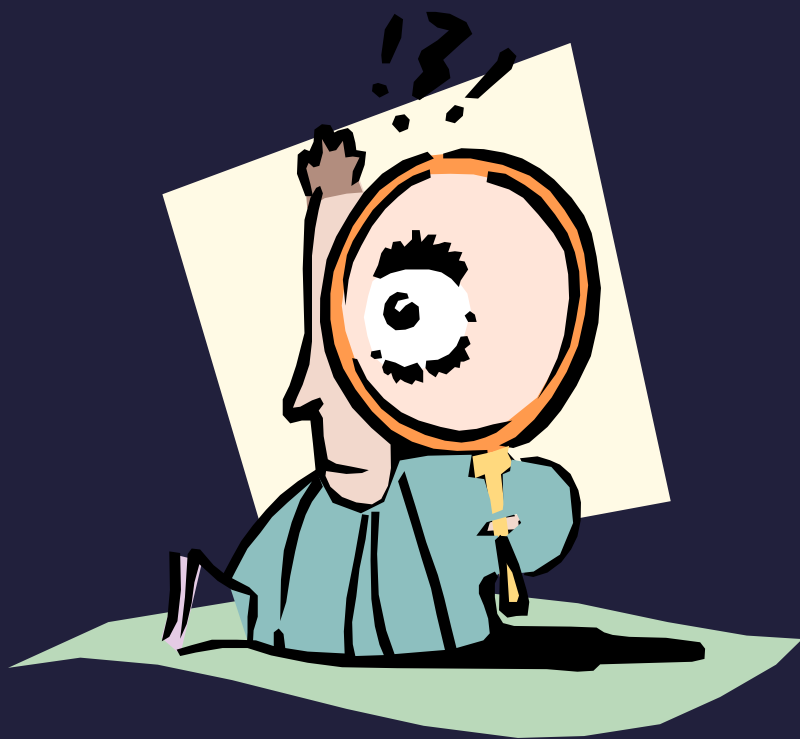
Did you know?

- There may be more “regulated” AST’s than UST’s in the U.S.
- Tanks under 300,000 gallons likely represent 90% of the actual tank units in operation
- STI estimates that there are over 4 million such tanks in existence today

Inspection of tanks based on the risk to the environment is important

- Tanks with safeguards inspected with a lower frequency and intensity than tanks without them
- Owners of tanks want the addition of safeguards to reduce or simplify expensive tank inspections because it makes good business sense.
- Regulators wish to minimize and eliminate releases.

2002 EPA Published SPCC Rules



- EPA provides examples of industry standards that may assist with compliance
 - Tank inspection per API 653 or STI SP001
- Requires “Integrity Testing”
 - Visual inspection along with another method now required (after October 2007 deadline)

STI AST Inspection Standards Committee

- Committee formed May 2004
- Purpose is review of
 - STI SP001 – Inspection of Shop-fabricated Tanks
 - STI SP031 – Repair of Shop-fabricated Tanks
- Consensus committee
 - Regulators
 - Manufacturers
 - Users and others

Committee members

Regulators

- Troy Swackhammer, EPA
- Barb Carr, EPA Region 5
- Greg Bareta, Wisconsin
- Alan Bakeberg, South Dakota
- Bill Baker, Pennsylvania
- John Albert, Missouri
- Sam Lillard, Virginia

Committee members

Users

- Phil Myers, Chevron, API
- Kevin Kupitz, Tank Consultants, Inc., API
- Tim Laughlin, NC PMAA
- Matt Bjornson, PMAA Motor Fuels Director
- Wiley Wilhelm, LCMF Anchorage
- Dave Darling, Nat'l. Paint Assn.
- Walter Chartrand, BP Air
- Keith Bodger, NICOR Gas
- Roger Claff, API Staff

Committee members

STI members

- Bill Herdman, Co-chair
 - Kennedy Tank, Indiana
- Tim Woofter
 - Stanwade Tank, Ohio
- Carl Greer
 - Service Welding, Kentucky
- Steve Allwein
 - Morrison Brothers, Iowa
- Sonny Underwood
 - Mid-South Steel, Missouri
- Jim O'Day
 - O'Day Equipment, N. Dakota

9 in-person meetings

- July 2004 – Chicago
- August 2004 – Chicago
- November 2004 – Las Vegas
- January 2005 – Chicago
- March 2005 – Denver
- April 2005 – Chicago
- June 2005 – Chicago
- June 2005 – St. Louis
- September 2005 – San Antonio
- January 18-19, 2006 - Phoenix

34 teleconferences of sub-committees

- Advisory Committee
- Checklists
- Field erected section
- Scope
- Definitions
- Portable containers
- Risk Matrix
- Thickness criteria
- Leak testing
- PE statement
- Format of records
- Owner's responsibilities
- Convault requirements
- Inspector certification
- Concrete pads
- Tank category definitions
- Other types of oils

Process

- Committee balanced
- Committee members vote
 - Approval by committee – June 2005
- Public comment
 - July 15 to September 1
 - Public meeting September 21

Inspection based on installation type and its risk to environment

- Tanks offering greatest risk have significantly more inspections
- Tanks with less risk have less inspections
- Identified single wall tanks on soil as having most risk
- Tanks with evidence of MIC - repair immediately



New concepts included

- Field-erected tanks up to a maximum 30-foot diameter and a maximum shell height of 50 (about 265,000 gallons).
 - Allows one inspector to inspect all tanks at a facility
- Portable containers
 - Establishes criteria for these containers

Release Prevention Barrier (RPB)

Liquid containment barrier that is sufficiently impervious to the liquid being stored and is installed under the AST. Its purpose is to divert leaks toward the perimeter of the AST where they can be easily detected as well as to prevent liquid from contaminating the environment.

- Steel (such as in steel double-bottom tanks),
- Concrete
- Elastomeric liners

Sufficiently impervious

- Sufficient resistance to diffusion and transport of hydrocarbon or other chemical substances to prevent contamination of the environment until clean-up occurs.
- Determination of “sufficiently impervious” is a technical consideration that a Professional Engineer or other qualified professional (such as Professional Geologist, Environmental Professional, etc.) must make.

Continuous Release Detection Method (CRDM)

A means of detecting a release of liquid through inherent design. It is passive because it does not require sensors or power to operate. Liquid releases are visually detected by facility operators.

- Tank with Release Prevention Barrier
- Secondary containment AST including double-wall ASTs, double-bottom ASTs, or other ASTs
- Elevated AST with release prevention barrier

Inspection types

- Owner monthly inspections
 - Check operation of vents, coating, foundation
- Formal External inspections
 - Certified inspector, but no entry
- Leak test
 - a one time test method to determine if a petroleum container is leaking.
- Formal Internal inspections
 - Entry into tank is necessary for full assessment

Table of Inspection Schedules

- Category 1
 - Secondary containment
 - CRDM
- Category 2
 - Secondary containment
- Category 3
 - No safeguards
- P
 - Owner's inspect only
- E
 - External by inspector
- I
 - Internal by inspector
- L
 - Leak testing

Risk Matrix concept

Tank Size (Gallons)		Category 1	Category 2	Category 3
Shop built tanks	0 - 1100	P	P	P, E&L(10)
	1101 - 5,000	P	P, E&L(10)	[P, E&L(5), I(10)] or [P, E(5) & L(2)]
	5,001 - 30,000	P, E(20)	[P, E(10)& I(20)] or [P, E(5) & L(10)]	[P, E&L(5), I(10)] or [P, E(5) & L(1)]
	30,001 - 50,000	P, E(20)	P, E&L(5), I(15)	P, E&L(5), I(10)
Field erected		P, E(5), I(10)	P, E(5), I(10)	P, E(5), I(10)
Portable containers		P	P	P **

Portable containers

- Closed AST 55 U.S. gallons or more and not intended for fixed installation
- Fills void in industry for inspection

** Owner shall either discontinue use of portable container or have DOT tested

- Plastic container - 7 years
- Steel container - 12 years
- Stainless Steel container - 17 years

Field-erected tanks (up to ~ 264,000 gallons)

Maximum shell height of 50 feet

Maximum diameter of 30 feet

- Construction nearly same as shop
- Some tanks not readily identified as shop or field
- One inspector for a facility

Category 1	Category 2	Category 3
P, E(5), I(10)	P, E&L(5), I(10)	P, E&L(5), I(10)

Formal External and Formal Internal Inspections

- Performed by Qualified Tank Inspector
 - STI Trained and Certified
 - API Certified
- Time schedules per Table

Category 1

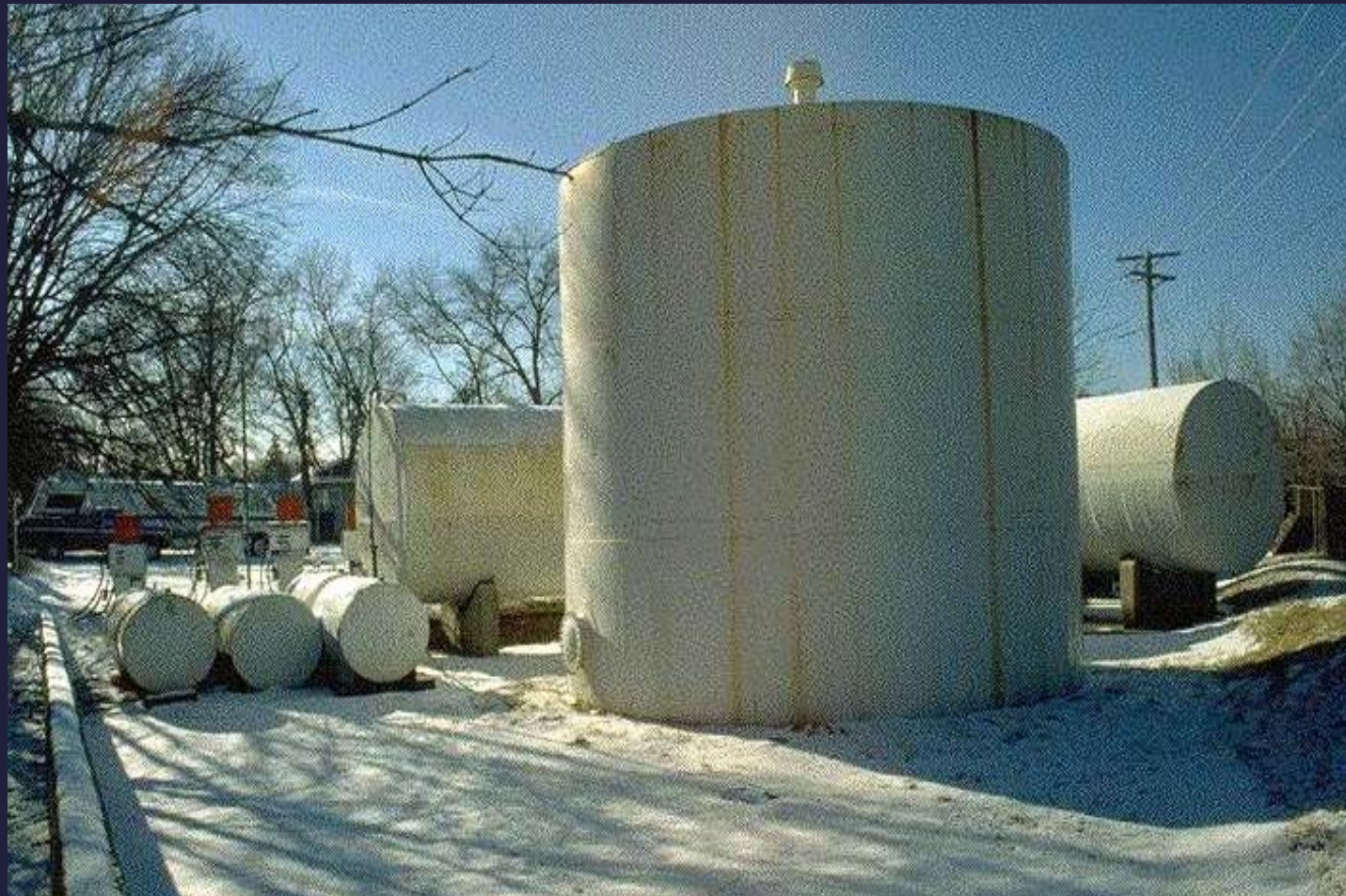


Double-wall Tank



Double-bottom Tank
in Concrete Dike

Category 2



Category 3



Tank examples

Courtesy of Kevin Kupitz
Tank Consultants, Inc.

Typical AST to be Inspected



Double Wall Horizontal Tank

- Access to all sides
- Double wall
- Outside
- On concrete pad
- 3,000 gallon
- Built 1989
- RPB/Double Wall
- SC/Double Wall
- No tank info



Integrity Test

- Owners Monthly checklist only
- No Formal External
- No Formal Internal



Raised Double Wall Vertical Tank

- Shop Built
- On curbed concrete pad
- 5,000 Gallon
- Access to all sides
- Double wall
- Built 1999
- SC/Double Wall
- RPB/Double Wall



Integrity Test

- Monthly Checklist
- No Formal External
- No Formal Internal



Vertical Tank

- 4,000 gallon
- Field erected or Shop built?
- Built 1962
- No other information
- SC/dike
- RPB/None



Integrity Test

■ FIELD ERECTED

- Monthly Checklist
- 5 year External. UT readings on the shell near the bottom and roof
- 20 year Internal. Corrosion Evaluation on the floor and UTT on shell and roof.

■ SHOP BUILT

- **Without documentation, assume Shop-built**
- Monthly Checklist
- External and Leak test every 10 years
- No Internal required

Rectangular tank

- No RPB
- No SC
- 400 gallon
- outside



Integrity Test

- Owner Monthly
- Formal External and Leak test every 10 years



Covered Horizontal Tank

- Has RPB
- Has SC



Integrity Test

- Owners Monthly checklist only
- No Formal External
- No Formal Internal



Summary

- SP001 committee is balanced with meetings open to all
- Extensive discussion of all issues
- Public comment period
- All tanks up to 30 foot diameter
 - Shop-fabricated, field-erected, portable
- Inspections are based on risk to the environment

Questions ??

- Dana Schmidt
Steel Tank Institute
- (847) 438-8265 x246
dschmidt@steeltank.com

