The SPCC Rule and Recent Amendments

U.S. Environmental Protection Agency
Office of Emergency Management
August 2010

Presentation Overview

1. SPCC Rule and 2008/2009 Amendments Overview
2. Compliance Dates
3. Proposed and Final Amendments
    A. Milk container proposal
    B. Exemptions
    C. Amended/Clarified Definitions
    D. Tier I Qualified Facilities
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4. Additional Information

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Section 1.

SPCC Rule and Amendments Overview

Spill Prevention, Control and Countermeasure (SPCC) Rule Overview

- Oil Pollution Prevention regulation (40 CFR part 112)
  - Originally promulgated in 1973
  - Specifies requirements for prevention of, preparedness for, and response to oil discharges
- Requirements help prevent oil discharges from reaching navigable waters or adjoining shorelines.
- Certain facilities, including farms, are required to develop SPCC Plans that describe equipment, workforce, procedures, and training to prevent, control, and provide adequate countermeasures to a discharge of oil.

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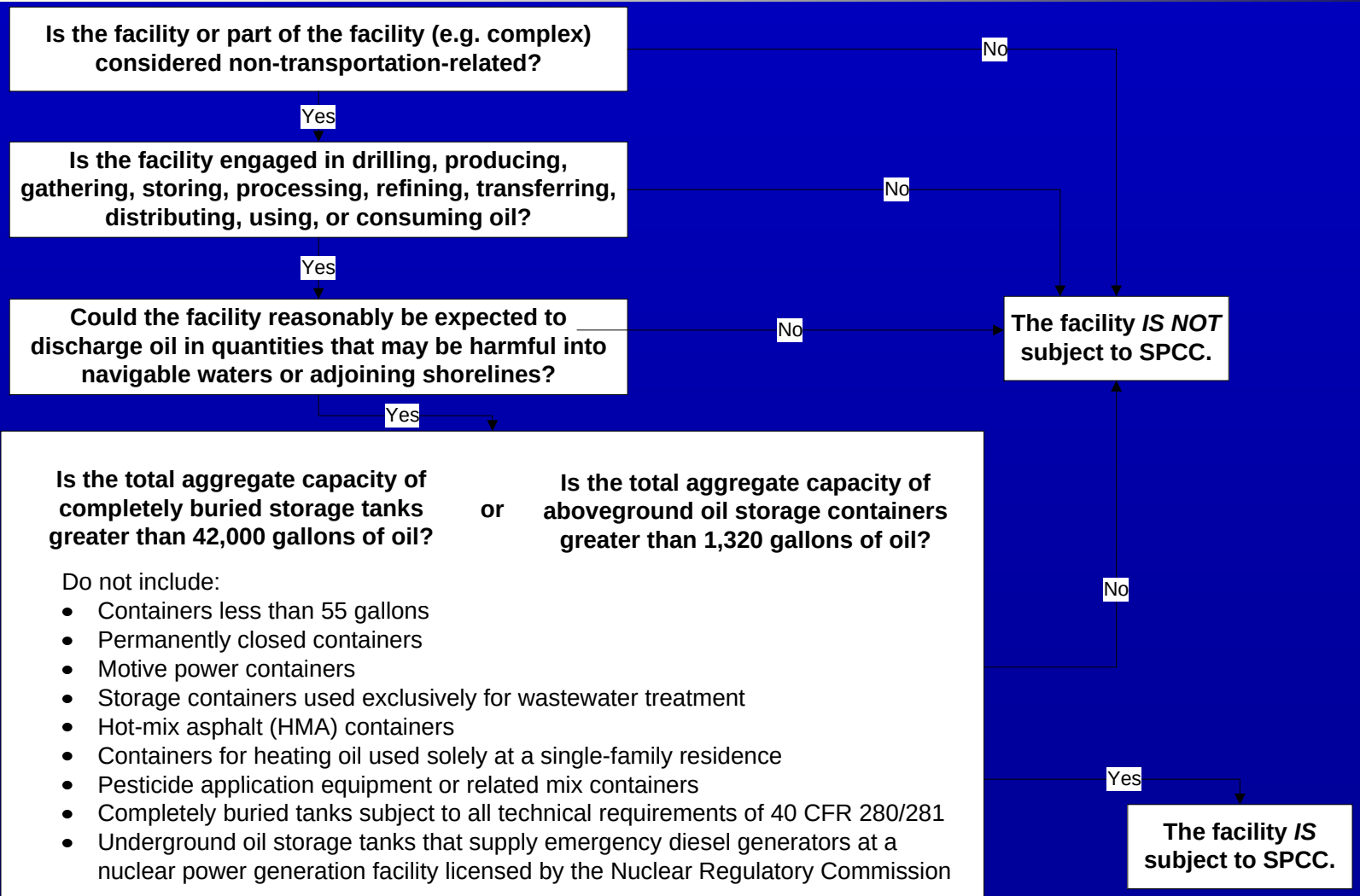
Who is Subject to the SPCC rule?



Definition of a Farm

As defined in December 2006 amendments to the SPCC rule,

A farm is a facility on a tract of land devoted to the production of crops or raising of animals, including fish, which produced and sold, or normally would have produced and sold, $1,000 or more of agricultural products during a year.

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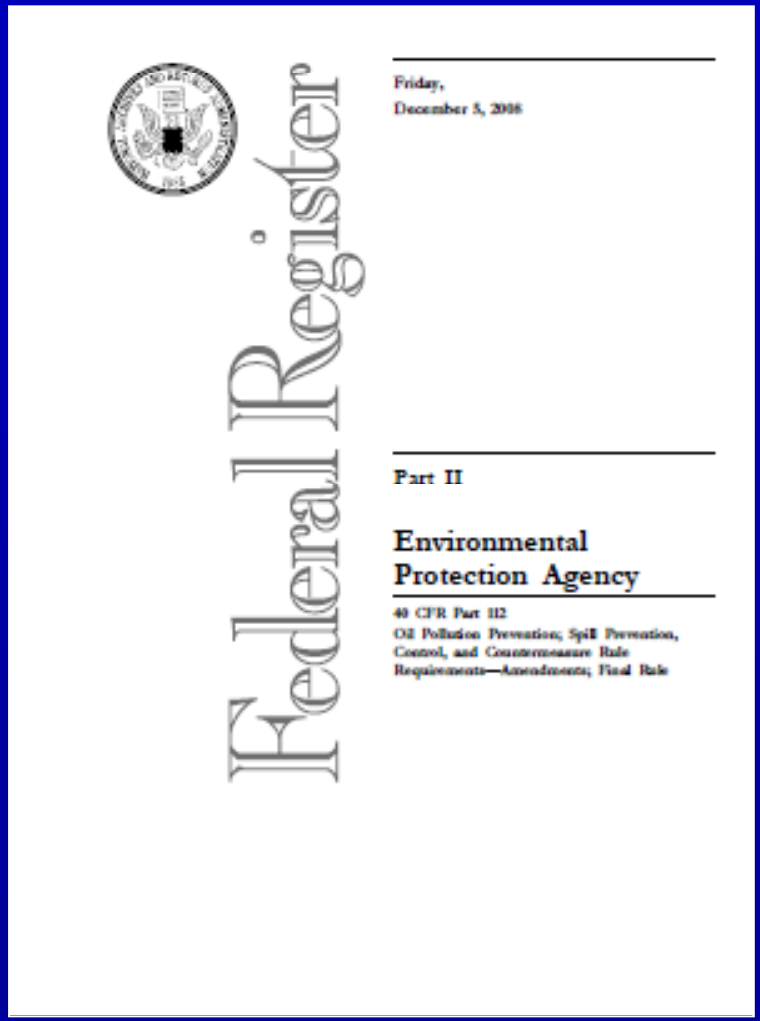
2008 SPCC Rule Amendments

- Published in the *FR* on December 5, 2008
- *Originally* scheduled to go in effect February 3, 2009
- Address areas highlighted in the EPA Regulatory Agenda and the 2005 OMB report "Regulatory Reform of the U.S. Manufacturing Sector"


Federal Register

Friday,
December 5, 2008

Part II

Environmental Protection Agency

40 CFR Part 112
Oil Pollution Prevention; Spill Prevention, Control, and Countermeasure Rule Requirements—Amendments; Final Rule

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Purpose of 2008 Amendments

- Address a number of issues raised by the regulated community
- Increase clarity
- Tailor and streamline certain requirements, including farms
- Facilitate compliance by owners and operators of a facility

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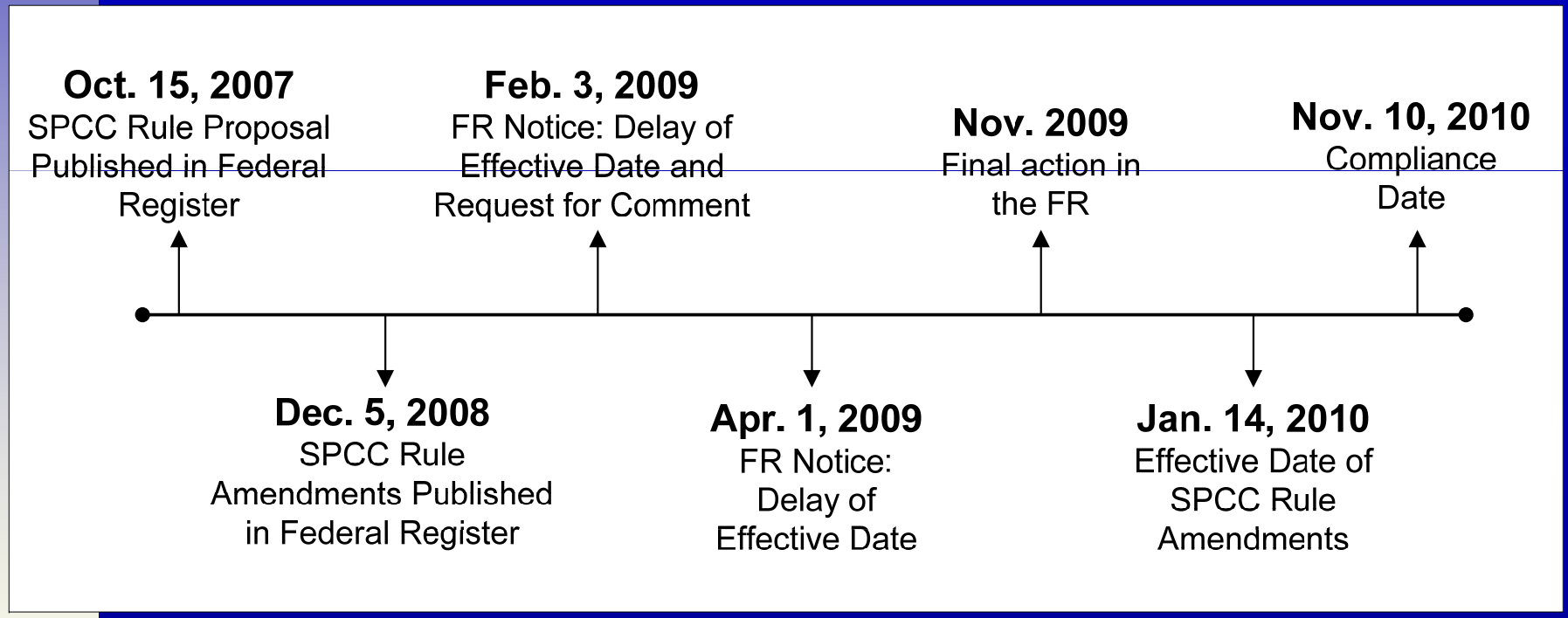
2008/2009 Amendments and Compliance Date Timeline



2009 SPCC Rule Amendments

- Finalized certain December 2008 amendments without change
- Removed certain provisions from the December 2008 final rule
- Provided technical corrections to certain provisions of the December 2008 amendments

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December 2008 Amendments Finalized without Change, highlighted for farms

- Exempt hot-mix asphalt and hot-mix asphalt containers
- Exempt pesticide application equipment and related mix containers
- Exempt USTs deferred under 40 CFR 280 and vaulted tanks at nuclear power generation stations
- Exempt heating oil containers at single-family residences
- Clarify applicability of mobile refueler requirements to farm nurse tanks
- Amend the definition of “facility”
- Revise facility diagram requirement to provide additional flexibility
- Define and clarify requirements for a “loading/unloading rack”
- Modify secondary containment requirement language at §112.7(c) to provide more clarity
- Exempt non-transportation-related tank trucks from the sized secondary containment requirements
- Simplify security requirements
- Amend the integrity testing requirements to allow greater flexibility
- Amend integrity testing requirements for animal fat and vegetable oil containers that meet certain criteria

(continues...)

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December 2008 Amendments Finalized without Change, highlighted for farms

- Amend definition of “production facility”
- Clarify that drilling and workover activities are not subject to provisions at 112.9
- Exempt certain intra-facility gathering lines at oil production facilities
- Provide more prescriptive requirements for all flowlines/intra-facility gathering lines
- Provide alternate compliance option for flow-through process vessels to comply with secondary containment
- Provide alternate compliance option to sized secondary containment for produced water containers
- Provide an alternative compliance option for flowlines/intra-facility gathering lines in lieu of secondary containment
- Define “produced water container”
- Clarify definition of “permanently closed” tanks
- Clarify applicability of the rule to man-made structures and wind turbines

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Technical Corrections to December 2008 Provisions of interest to farms

- Clarifications and corrections of typographical and formatting errors related to the designation of a subset of “Tier I” qualified facilities with a set of streamlined SPCC rule requirements.

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December 2008 Provisions Removed from Final Rule of interest to farms

- Exclusion for oil production facilities and farms from loading/unloading rack requirements

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Section 2.

Compliance Dates

Farms: Compliance Dates

- The Agency finalized a new compliance date for all facilities, including farms as November 10, 2010.
- August 3, 2010: Proposed to extend compliance date for onshore facilities, including farms, to November 10, 2011.
- For farms with dairy operations, where tanks are constructed to 3-A sanitary standards and subject to Grade "A" PMO, then 1 year from effective date of milk container final regulation or date set by the rule.
- Comment closes on August 18, 2010.
- Note: Farms subject to SPCC requirements on or before August 16, 2002 must maintain their Plans.

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Section 3.

2009 Proposed and Final Amendments

Milk Container Proposal

- On January 15, 2009, EPA proposed to exempt milk containers and associated piping and appurtenances (see factsheet).
- Comment period closed on February 17, 2009.
- June 9, 2010: EPA responded to Dr. Jamie Jonker of the National Milk Producers Federation. EPA signaled that we would complete final action on the proposal in early 2011.

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Pesticide Application Equipment

- Exempt equipment includes:
  - Ground boom applicators
  - Airblast sprayers
  - Specialty aircraft that apply measured amounts of pesticides to crops and/or soil
  - Related mix containers
- Exemption applies to all pesticide application equipment and related mix containers, regardless of ownership or where used.

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Examples of Pesticide Application Equipment

Ground Boom Sprayer

Airblast Sprayer

Aerial Applicator

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Residential Heating Oil Containers

- Residential heating oil containers at single-family residences are exempt from the SPCC rule.
  - Includes general rule applicability and capacity calculation requirement
- Applies to containers that are:
  - Aboveground or completely buried
  - Located at a farm or single-family residences
  - Used solely to store heating oil used to heat the residence
- SPCC requirements continue to apply to oil containers used to heat other non-residential buildings within a facility.
- EPA did not intend to regulate residential uses of oil (i.e., those at non-commercial buildings) under the SPCC rule.

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Amended Definition of “Facility”

- Clarifies that the definition of facility alone determines SPCC applicability.
- Clarifies that containers can be separated or aggregated, based on various factors in defining “facility”
  - The owner or operator has discretion in identifying which contiguous or non-contiguous buildings, properties, parcels, leases, structures, installations, pipes, or pipelines make up the facility.
- Adds the terms “property,” “parcel,” and “lease” to the list of example terms that can be considered in determining facility boundaries.
- Clarifies that the term "waste treatment" refers to oil waste treatment.

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Amended Definition of "Facility"

Facility means any mobile or fixed, onshore or offshore building, property, parcel, lease, structure, installation, equipment, pipe, or pipeline (other than a vessel or a public vessel) used in oil well drilling operations, oil ~~production, oil refining, oil storage, oil gathering, oil processing, oil transfer,~~ oil distribution, and oil waste treatment, or in which oil is used, as described in Appendix A to this part. The boundaries of a facility depend on several site-specific factors, including but not limited to, the ownership or operation of buildings, structures, and equipment on the same site and types of activity at the site. Contiguous or non-contiguous buildings, properties, parcels, leases, structures, installations, pipes, or pipelines under the ownership or operation of the same person may be considered separate facilities. Only this definition governs whether a facility is subject to this part.

Tier I Qualified Facilities: Overview

- "Qualified facilities" were addressed in the 2006 SPCC Amendments.
- "Tier I" qualified facilities have an additional option to complete and implement a streamlined, self-certified SPCC Plan template (Appendix G to the rule; see handout).
- All other qualified facilities are designated "Tier II" qualified facilities.
- The 2009 rule amendments further streamline and tailor the SPCC requirements for a subset of qualified facilities.

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Tier I Eligibility Criteria

- 10,000 gallons or less in aggregate aboveground oil storage capacity; and
- For the 3 years prior to Plan certification, or since becoming subject to the rule if it has operated for less than 3 years, the facility must not have had:
  - A single discharge of oil to navigable waters or adjoining shorelines exceeding 1,000 U.S. gallons, or
  - Two discharges of oil to navigable waters or adjoining shorelines each exceeding 42 U.S. gallons within any 12-month period; and
- Maximum individual aboveground oil storage container capacity of 5,000 U.S. gallons.

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Tier I Requirements

- Option to complete a self-certified SPCC Plan template instead of a full SPCC Plan
  - A Tier I qualified facility owner/operator can choose to comply with either Tier I or Tier II requirements or prepare a PE-certified Plan in accordance with all applicable requirements of §112.7 and subparts B and C.
- Template is found in Appendix G to the SPCC rule.
- Template is designed to be a simple SPCC Plan.
  - Eliminates and/or modifies certain requirements and provisions that generally do not apply to facilities that store or handle smaller volumes of oil
- Limited to those facilities that:
  - Do not use environmentally equivalent measures,
  - Do not determine secondary containment to be impracticable, and
  - Do not need PE certification to comply with any rule requirements (e.g., produced water compliance alternative that includes a skimming option, described later).

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Summary: Qualified Facilities Applicability

If the facility has…	And…	And the facility has…	Then:
10,000 U.S. gallons or less aggregate aboveground oil storage capacity;	Within any twelve-month period, three years prior to the Plan certification date, or since becoming subject to the SPCC rule if in operation for less than three years, there has been: (1) No single discharge of oil to navigable waters or adjoining shorelines exceeding 1,000 U.S. gallons; and (2) No two discharges of oil to navigable waters or adjoining shorelines each exceeding 42 U.S. gallons in any 12 -month period	No individual aboveground oil containers greater than 5,000 U.S. gallons;	**Tier I:** Complete and self-certify Plan template (Appendix G to 40 CFR part 112) in lieu of a full PE-certified Plan.
		Any individual aboveground oil container greater than 5,000 U.S. gallons;	**Tier II:** Prepare self-certified Plan in accordance with all applicable requirements of §112.7 and subparts B and C of the rule, in lieu of a PE-certified Plan.

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Revision to General Secondary Containment Requirement

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

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

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Security Requirements

- Security requirements finalized for qualified facilities in December 2006 extended to all applicable facilities, including farms.
  - Streamlined, performance-based
  - Tailored to the facility's specific characteristics and location
- A facility owner/operator is required to describe in the SPCC Plan how he will:
  - Secure and control access to all oil handling, processing and storage areas;
  - Secure master flow and drain valves;
  - Prevent unauthorized access to starter controls on oil pumps;
  - Secure out-of-service and loading/unloading connections of oil pipelines; and
  - Address the appropriateness of security lighting to both prevent acts of vandalism and assist in the discovery of oil discharges.

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Integrity Testing

- The amendment makes the integrity testing requirements consistent with requirements for qualified facilities (as finalized in December 2006).
- Provides flexibility in complying with bulk storage container inspection and integrity testing requirements.
  - Allows an owner or operator to consult and rely on industry standards to determine the appropriate qualifications for tank inspectors/testing personnel and the type/frequency of integrity testing required for a particular container size and configuration.
  - Enables facilities to easily adjust Plans to reflect changes in industry standards.

Proposed changes at:

112.8(c)(6) and 112.12(c)(6)

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Farm Nurse Tanks: Preamble Clarification

- Nurse tanks are mobile/portable containers used at farms to store and transport fuel for transfers to or from farm equipment and to other bulk storage containers.
- The definition of “mobile refueler” includes nurse tanks, as well as non-road licensed refueling equipment that are used to refuel farm equipment in the fields.
- Nurse tanks are exempt from sized secondary containment.
- Must meet general secondary containment requirements at §112.7(c)

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UST Oil Transfer Clarification

- A clarification to correct preamble language in the 2002 amendments that was inconsistent with the Agency's position regarding transfer activities from exempt containers.
- Transfer activities associated with an exempt UST, at an otherwise regulated SPCC facility, are covered and must be addressed in the SPCC Plan.
  - If a transfer to or from an exempt UST occurs across a loading/unloading rack (as defined in the amended rule) then the facility must comply with 112.7(h).
  - All other transfers/equipment (dispensers) must be addressed and meet the general secondary containment requirements.
  - Dispensers and racks are not part of a UST system and therefore SPCC regulated.

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Definition of "Permanently Closed": Preamble Clarification

- SPCC rule exempts any oil storage container that is permanently closed.
- *Permanently closed* means any container or facility for which:
  - (1) All liquid and sludge has been removed from each container and connecting line; and
  - (2) All connecting lines and piping have been disconnected from the container and blanked off, all valves (except for ventilation valves) have been closed and locked, and conspicuous signs have been posted on each container stating that it is a permanently closed container and noting the date of closure.
- Definition of "permanently closed" does not require a container to be removed from a facility.
  - Permanently closed containers may be brought back into use as needed for variations in production rates and economic conditions.
- Permanent closure requirements under the SPCC rule are separate and distinct from the closure requirements in regulations promulgated under Subtitle C of RCRA.

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Manmade Structures: Preamble Clarification

- Certain manmade features may be taken into consideration in determining how to comply with SPCC requirements.
- SPCC Plan preparer can consider:
  - The ability of building walls and/or drainage systems to serve as secondary containment for a container.
    - Freeboard for precipitation not necessary if container is indoors
  - Indoor conditions that reduce external corrosion and potential for discharges, to develop a site-specific integrity testing and inspection program.

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Section 4.

Additional Information

Outreach Materials

- SPCC farm factsheet
- Tier 1 template examples for farms (in the works)
- SPCC Greenbook (in the works)

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National Response Center (NRC)

- Report all oil discharges to waters of the United States or adjoining shorelines to NRC at 1-800-424-8802.
- Federal government's centralized reporting center, which is staffed 24 hours a day by U.S. Coast Guard personnel
- Any person in charge of a vessel or an onshore or offshore facility must notify NRC immediately after he or she has knowledge of the discharge.
- NRC relays information to EPA or U.S. Coast Guard depending on the location of the incident.
- An On-Scene Coordinator evaluates the situation and decides if federal emergency response action is necessary.

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SPCC Reporting Requirements

- Some discharges must also be reported to EPA
  - Requirements found in §112.4(a)
  - Applies to facilities subject to the SPCC rule
- Report to the EPA Regional Administrator (RA) when there is a discharge of:
  - More than 1,000 U.S. gallons of oil in a single discharge to navigable waters or adjoining shorelines
  - More than 42 U.S. gallons of oil in each of two discharges to navigable waters or adjoining shorelines within a 12-month period
  - When making this determination it is the amount of the discharge in gallons that reaches navigable waters or adjoining shorelines (EPA considers the entire volume of the discharge to be oil for the purposes of these reporting requirements)
  - An owner/operator must report the discharge(s) to the EPA Regional Administrator within 60 days

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For More Information

- 2008 and 2009 SPCC rule amendment Federal Register notices (73 FR 74236; Dec. 5, 2008 and 74 FR 58784, Nov. 13, 2009)
  - http://www.gpoaccess.gov/fr/
  - http://www.epa.gov/emergencies/content/spcc/
- Complete Oil Pollution Prevention regulation (40 CFR part 112)
  - http://www.gpoaccess.gov/cfr/
  - http://www.epa.gov/emergencies/lawsregs.htm
- EPA Emergency Management Web Sites
  - www.epa.gov/emergencies
  - www.epa.gov/oilspill
- Superfund, TRI, EPCRA, RMP, and Oil Information Center
  - (800) 424-9346 or (703) 412-9810
  - TDD (800) 553-7672 or (703) 412-3323
  - www.epa.gov/superfund/resources/infocenter

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Questions and Answers

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Integrity Testing Industry Standards

prepared for NAEHSS 2010

Module Objectives

- Overview of tank types and tank components
- Overview of Petroleum Tank Industry Standards, focusing on STI SP001
- Inspection Methods and Equipment
- Inspection – Tank conditions and problem areas to be aware of
- Tank Inspection Reports –common pitfalls

Tank Types

- Atmospheric
  - Operate at internal pressure slightly above atmospheric pressure (API 650 and UL 142 tanks)
- Low Pressure
  - Designed to operate at internal pressure higher than atmospheric (2 ½ to 15 psig)
- Pressure Vessels
  - Vessels operating above 15 psig

Tank Types

- Aboveground Storage Tanks (AST)
  - Field Erected
  - Shop Fabricated
  - Portable Containers
- Underground Storage Tanks (UST)
- Other Tanks

Tank Types

Field Erected AST

- Welded steel
- Riveted (older tanks – pre 1939)
- Bolted tanks (temporary and production tanks)

Tank Types – ex. Field Erected AST, usually not found on farms, but at bulk terminals

Tank Types

Shop Fabricated Tanks (AST); most farm tanks are shop-built tanks

Shop fabricated tanks may be:

- Single Wall
- Double Wall
- Self-diked (built with secondary containment integral with the tank)
- Fire resistant

Tank Types

Shop Fabricated Tanks (AST)

Double Wall Tanks

- Outer wall provides containment of leaks
- The space between the outer wall and inner wall is small (less than 1 inch) and is referred to as the interstitial space
- The interstitial space serves as a means of detecting leaks in the inner wall
- Can not inspect the inner wall without entering the tank

Tank Types

Shop Fabricated Tanks (AST)

- May be horizontal or vertical
- Usually cylindrical, but may be rectangular
- Horizontal tanks are supported on saddles (tank is not in contact with the ground)
- Vertical tanks are usually not elevated, the bottom is supported on the ground, concrete pad, or other type of foundation
- Horizontal tanks have an advantage in that leaks can be seen

Tank Types – Shop Fabricated Tanks (AST)

Tank Types – Shop Fabricated Tanks (AST)

Tank Types – Shop Fabricated Tanks (AST)

Tank Types – Shop Fabricated Tanks (AST)

Tank Types

Portable Containers

Tank Types

Underground Storage Tanks (UST)

Per 40 CFR 112.2 *Completely buried tank* means any container completely below grade and covered with earth, sand, gravel, asphalt, or other material. Containers in vaults, bunkered tanks, or partially buried tanks are considered aboveground storage containers for purposes of this part.

Tank Types

Underground Storage Tanks (UST)

Shop Fabricated Tanks

- STI-P3 Cathodically-protected steel tank
- ACT-100 Steel / FRP composite tank
- ACT-100U Steel tank with an external urethane coating

Industry Standards

Tank Inspection and Repair Standards

- API 653
- API RP 580 Risk Based Inspection
- API 12R
- STI SP001
- STI SP031 Standard for Repair of Shop Fabricated Aboveground Tanks

Industry Standards

Related Industry Tank Design Standards

- API 650 Welded Steel Tanks for Oil Storage (relates to API 653)
- API 12B, 12D, 12 F and 12P (relates to API 12R)
- UL 142 8th Edition July 2002 (relates primarily to STI SP001 and STI SP031)

Industry Standards

STI SP001

What is STI SP001?

Standard for the Inspection of Aboveground Storage Tanks

Industry Standards

STI SP001

The following slides on STI SP001 were prepared by Dana Schmidt, PE STI/SPFA and are used with permission from STI.

Note: STI Standard SP001 is a consensus-based industry standard. Tank manufacturers, PMAA representatives, State environmental regulatory representatives, and EPA participated in the development of the standard.

STI Committee Chairman's View-perspective from the committee chairman to get parties to agree on tank inspections-don't try at home.

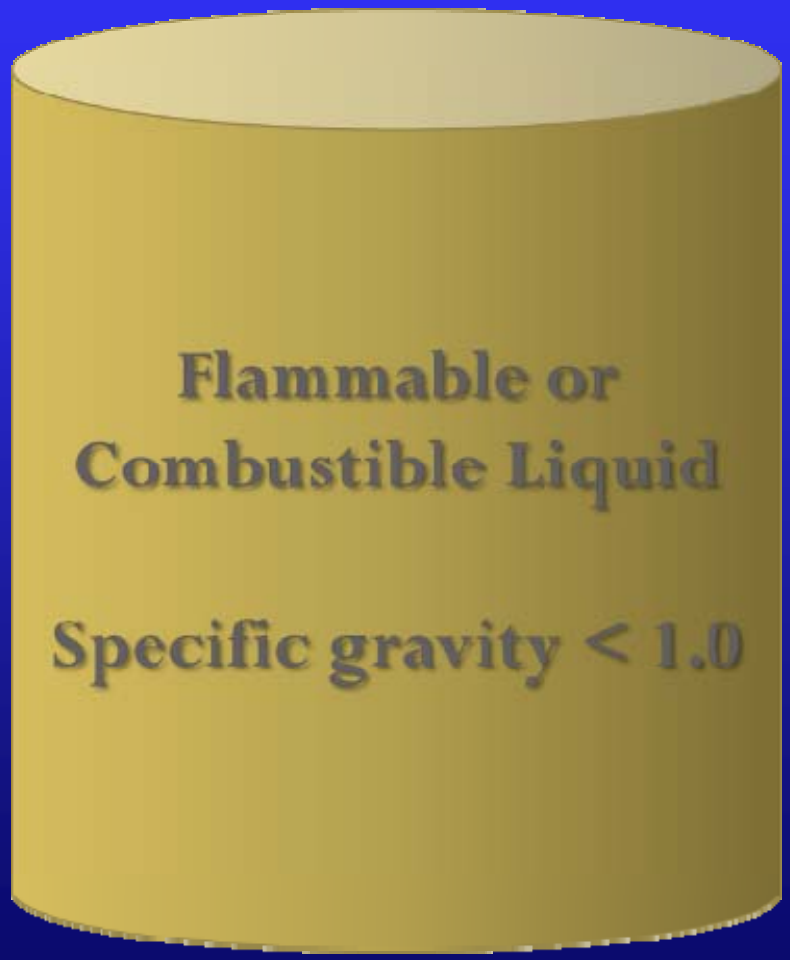
Steel Tank Institute
Standards for Inspection and Repair of Tanks

Dana Schmidt, PE
STI/SPFA

Freshwater Spills Symposium 2009

AST Types included in STI SP001

SP001 Scope



Ambient up to 200°F

Atmospheric pressure

Portable Containers (per SP001)

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

Shop-Fabricated AST (per SP001)

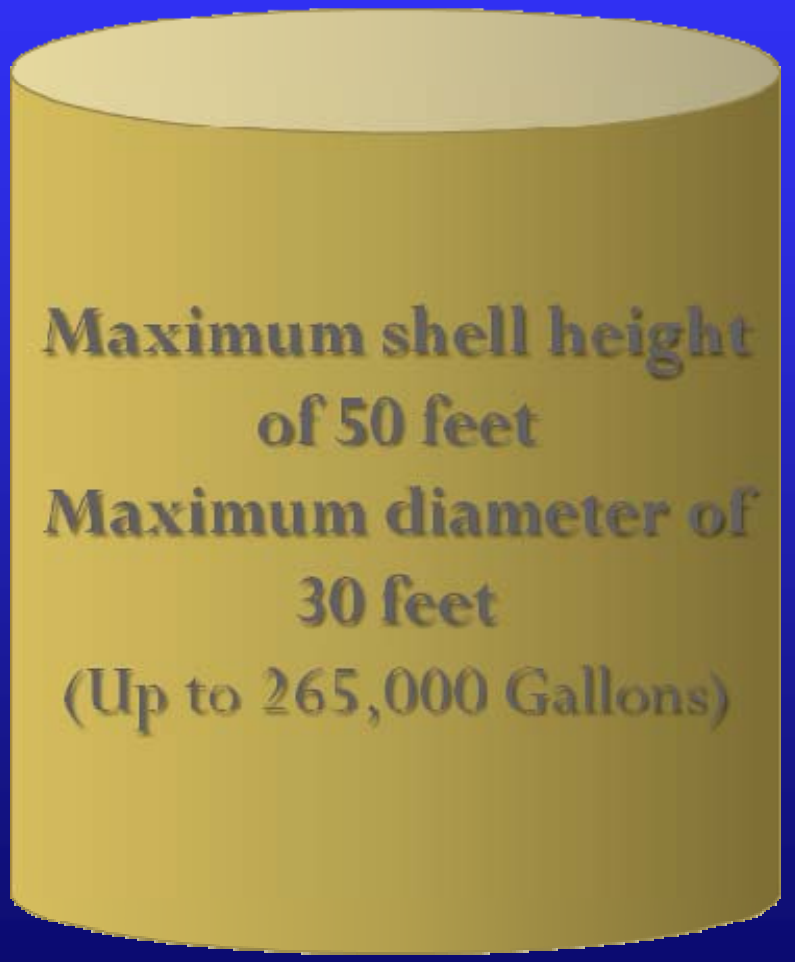
<u>Welded</u> metal AST fabricated in a manufacturing facility

OR

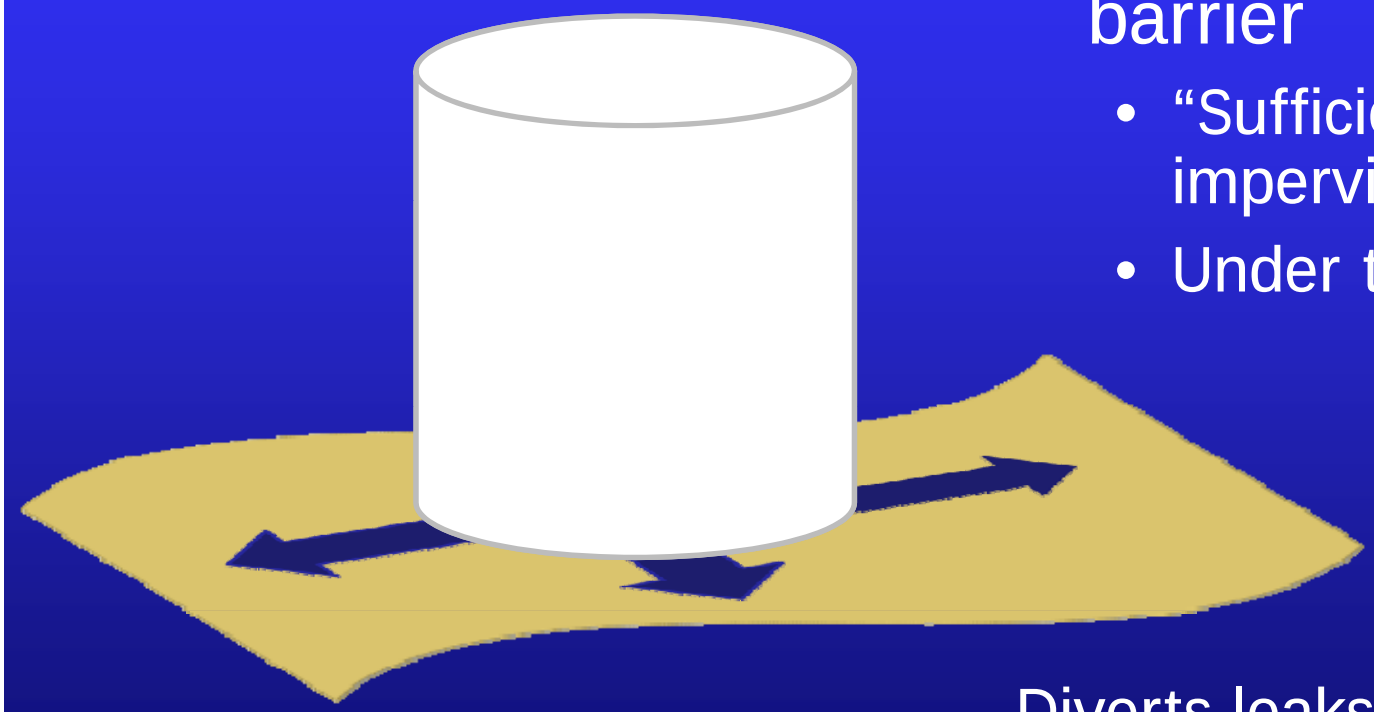
An AST without a nameplate with a volume **<u>less than or equal to 50,000 U.S. gallons</u>**

Field Erected Tanks (per SP001)

- Allows one inspector to inspect all tanks at a facility
- Placed in Appendix
- Welded metal AST erected on-site where it will be used.
- An AST without a nameplate that is more than 50,000 U.S. gallons and a maximum shell height of 50 feet and a maximum diameter of 30 feet



Release Prevention Barrier (RPB)



Liquid containment barrier

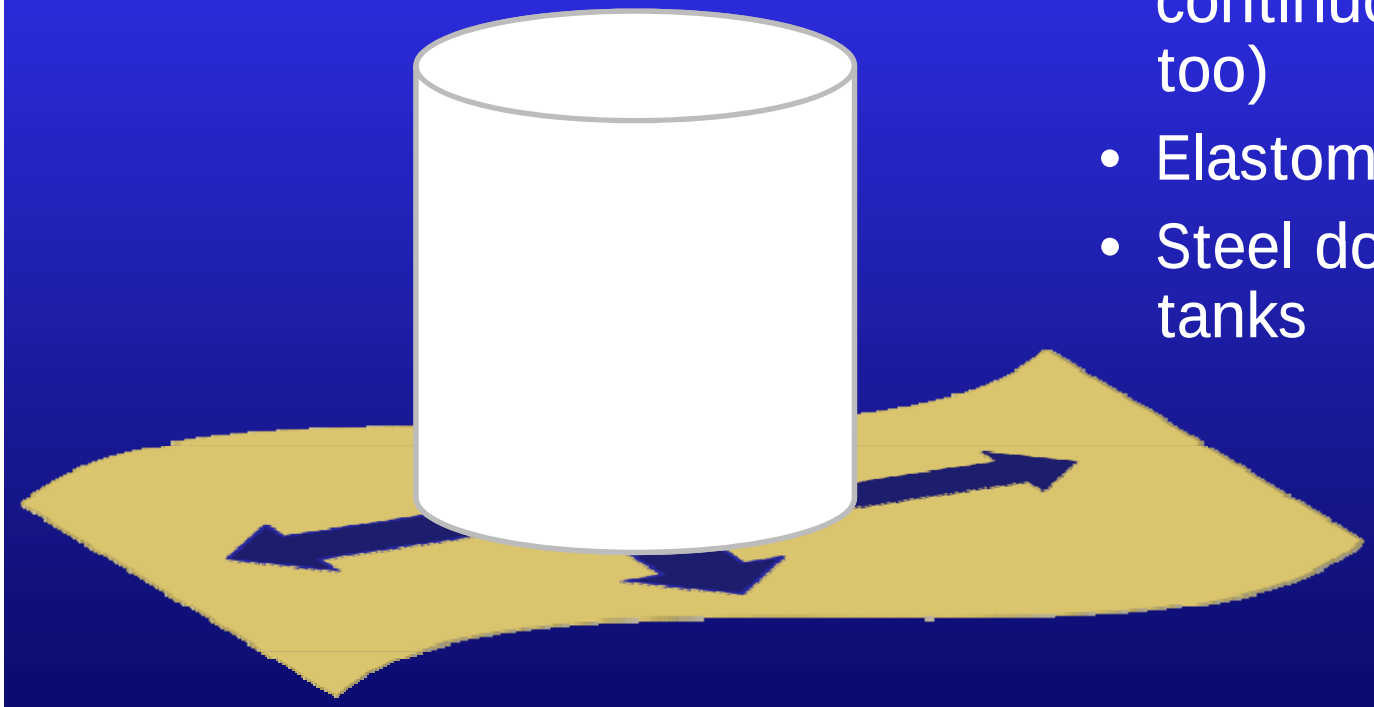
- "Sufficiently impervious"
- Under the AST

Diverts leaks toward the perimeter of the AST where they can be easily detected

Sufficiently Impervious

"Sufficient resistance ... to prevent contamination of the environment until cleanup occurs"

Release Prevention Barrier (RPB)



Examples – all must be sufficiently impervious

- Concrete (must be continuous under tank, too)
- Elastomeric liner
- Steel double bottom tanks

Continuous Release Detection Method CRDM

Detects releases through inherent design

Passive – no sensors or power to operate

Facility operator can visually detect release

Examples of CRDM:

- Tank with Release Prevention Barrier (RPB)
- Double-Wall ASTs
- Double-Bottom ASTs
- Elevated AST with an RPB

Table of Inspection Schedules

- Category 1
  - Secondary containment
  - Release detection method (CRDM)
- Category 2
  - Secondary containment
- Category 3
  - No safeguards

Category 1 – Secondary containment and CRDM

Double-wall Tank

Double-bottom Tank in a Dike

Category 2 – Secondary containment

- Tanks in earthen dike
  - Dike prevents release due to catastrophic tank release only

Category 3

No Secondary Containment

No RPB

Category 3

RPB, but no secondary containment

Inspection Types

- Owner Monthly/Annual Inspections
  - Check operation of vents, coating, foundation
- Formal External Inspections
  - Certified inspector, but no entry
- Leak Test
  - Determine if AST is leaking.
- Formal Internal Inspections
  - Entry into tank is necessary

Formal External and Formal Internal Inspections

- Performed by Qualified Tank Inspector
  - STI Trained and Certified
  - API Certified
- Type and frequency of inspections per inspection schedule
- Suitability for Continued Service

Formal External Inspections

- Containment area
- Stairways, ladders
- Normal vents
- Emergency vents
- Overfill alarms
- Fire valves
- UT of accessible areas, near base of tank (internal inspection if problems found)

Formal Internal Inspections

- Check all external inspection items
- UT of entire tank bottom
  - Elevated tanks do not require entry
- UT methods
  - UTT – point measurements (15 points per sq. ft.)
  - UTS – full scan if problems found in UTT

Inspection Schedule/Table

P–Periodic Inspection by Owner E-External Inspection by Certified Inspector I-Internal Inspection L-Leak Test

Size, Gallons		**Category 1**	Category 2	Category 3
Shop built tank	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) and L(2)]
	5,001 - 30,000	P, E(20)	[P, E(10)and I(20)] or [P, E(5) and L(10)]	[P, E&L(5), I(10)] or [P, E(5) and L(1)]
	30,001 - 50,000	P, E(20)	P, E&L(5), I(15)	P, E&L(5), I(10)
Field Erect Tank		P, E(5), I(20)	P, E(5), I(20)	P, E(5), I(20)
Portable Containers		P	P	P **


Hy-Way
No.2 trks.
60/40
40/60
Off ROAD
HEAVY No.2
Equipt 60/40
40/60
STI SP001 Test Site
9 1:58PM

Inspection Schedule/Table

P–Periodic Inspection by Owner E-External Inspection by Certified Inspector I-Internal Inspection L-Leak Test

Size, Gallons		Category 1	Category 2	**Category 3**
Shop built tank	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) and L(2)]
	5,001 - 30,000	P, E(20)	[P, E(10)and I(20)] or [P, E(5) and L(10)]	[P, E&L(5), I(10)] or [P, E(5) and L(1)]
	30,001 - 50,000	P, E(20)	P, E&L(5), I(15)	P, E&L(5), I(10)
Field Erect Tank		P, E(5), I(20)	P, E(5), I(20)	P, E(5), I(20)
Portable Containers		P	P	P **

STI SP001

End of STI SP001 Presentation

Tank Inspection Methods and Equipment

- Visual
- Ultrasonic Thickness (UT) Measurement
- Ultrasonic Thickness (UT) Scanning
- Magnetic Flux Leakage (MFL) Scanning
- Vacuum Box Testing
- Helium Leak Testing
- Magnetic Particle (MT)
- Liquid Penetrant (PT)
- Radiography (RT)
- Coating Thickness Gauge
- Other

Inspection Methods and Equipment

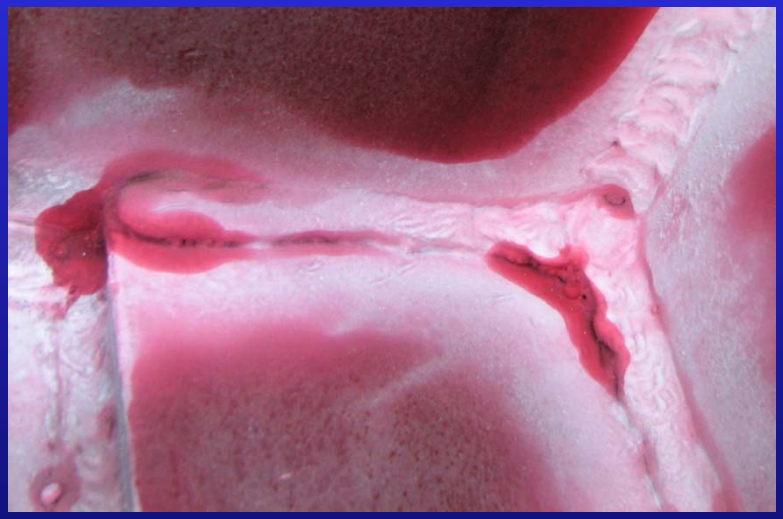
Visual (VT)

Inspection Methods and Equipment

Ultrasonic Thickness (UT) Measurement

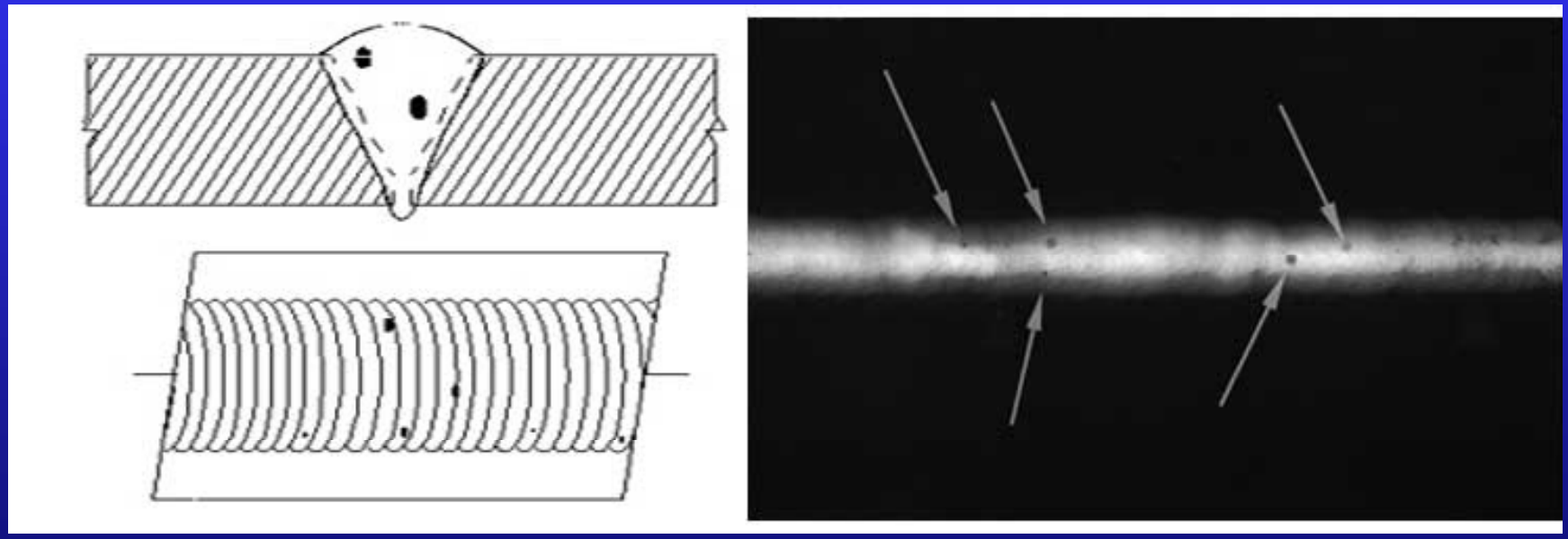
Inspection Methods and Equipment

Liquid Penetrant (PT); for weld inspections



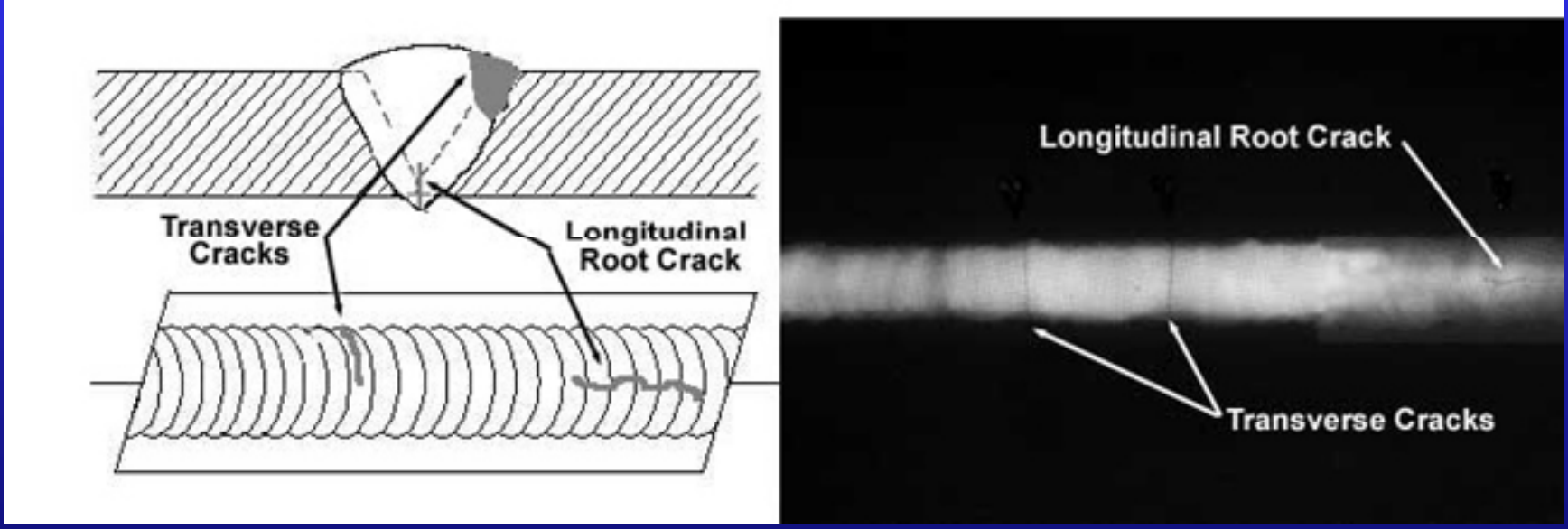
Inspection Methods and Equipment

Radiography (RT); for weld inspections



Inspection Methods and Equipment

Radiography (RT)



Inspection Methods and Equipment

Coating Thickness Gauge; measure remaining wall thickness of tank

Tank Inspection – What to Look For

*Conditions that affect the hydraulic and structural integrity of the tank

Tank Inspection – What to Look For

Foundation

Inspection – What to Look For

Foundation

Tank Inspection – What to Look For

Pitting and Corrosion

Tank Inspection – What to Look For

Pitting, Corrosion, and Holes

Tank Inspection – What to Look For

Pitting, Corrosion, and Holes

Tank Inspection – What to Look For

Welds

Tank Inspection – What to Look For

Welds

Tank Inspection – What to Look For

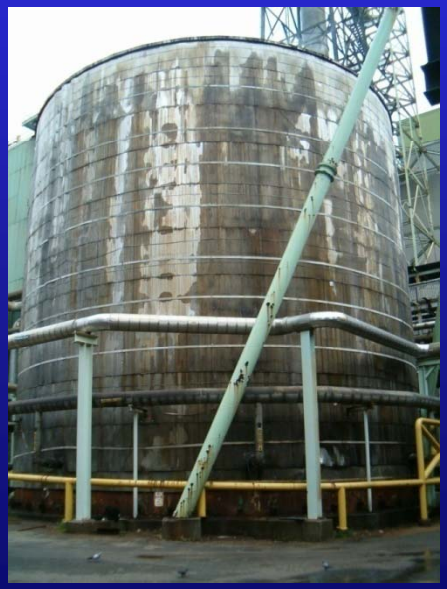
Floor Edge Settlement

Tank Inspection – What to Look For

Shell Distortions

Tank Inspection – What to Look For

Insulated Tanks



Tank Inspection – What to Look For

Coating Failure

Tank Inspection – What to Look For

Suspicious looking repairs

Tank Inspection – What to Look For

Inspection Checklist

- API 653 Appendix C has extensive checklists that are considered a good guideline (but by no means all inclusive)
- STI SP001 Appendix C also has inspections checklists

Tank Inspection Reports

Reports should contain:

- Date of inspection
- Name, company, API 653 certification (or STI certificate) number and signature of the authorized inspector responsible for the inspection

Tank Inspection Reports

Reports should contain:

- Stamped by a professional engineer, if required by owner (not an API requirement)
- Type of inspection (external or internal)

Tank Inspection Reports

Reports should contain:

- Description of the tank (number, size, capacity, year constructed, material of construction, service history, type of roof and bottom design)
- Statement on suitability for service

Tank Inspection Reports

Reports should contain:

- Recommendations
  - For repairs and monitoring to restore the hydraulic and structural integrity of the tank
  - Maintain the integrity of the tank until the next inspection
  - Reasons for the recommendations

Tank Inspection Reports

Reports should contain:

- Recommendations
  - Recommended maximum interval until the next inspection and basis for calculation of the interval
  - May also include other less critical observation, suggestions, and recommendations

Tank Inspection Reports

Reports should contain:

- Description of the scope of inspection
- List of components inspected and condition (API 653 or STI SP001 Appendix C Inspection Checklists may be used)
- The report should also note any areas that were not inspected and reasons

Tank Inspection Reports

Reports should contain:

- Inspection methods and tests used
- Corrosion rates of the bottom and shell if any found, or reasons why calculations not needed
- Settlement survey measurements and analysis (if performed)
- Drawings, photographs, NDE data, and other pertinent information
- See STI SP001 for shop fabricated tanks

Tank Inspection Reports

Suitability for Service Evaluations

- Shell stress calculations
- Floor edge settlement & bulge calculations
- Remaining floor life calculations
- Next inspection interval
- Seismic evaluation
- Wind evaluation

Tank Inspection Reports

Common Pitfalls or Red Flags

- Report not signed by inspector
- Inspector not API or STI certified
- Type of inspection and scope of inspection not stated

Tank Inspection Reports

Common Pitfalls or Red Flags

- Recommendation on schedule for next inspection not provided
- Statement on tank suitability for service not provided
- Recommendations on tank repairs (if required) not provided
- Identification of problems with no recommendations provided