Making Sure Your AST is Compliant with SPCC

Presented By:
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Preparing For Your SPCC Plan

- The Goal of an SPCC Plan is to Prevent a Release from Occurring.
- Tanks, Drums, and Containers must be set-up to prevent a release from occurring.
- As part of developing a SPCC Plan, you may have to upgrade some of these components to complete your SPCC.
Aboveground Gas Tank?
Tank Design and Compliance with 112.7 of SPCC Regulations

- Prepare with good engineering practice
- Full approval of management to commit resources
- Complete plan in writing
- If plan calls for additional facilities or procedures, methods or equipment that are not yet fully operational, items must be discussed explaining the details of installation and operational startup.
Compliance Starts With The Design

- Proper Design or Upgrade
- Follow Industry Standards and Guidelines
- Choose The Right Equipment
PROPER DESIGN

PRIMARY ISSUES

- Safety Considerations
- Product Losses
- Precipitation Handling
- Space Availability and Accessibility
- Proper Tank Placement
- Aesthetics and Security
PROPER DESIGN

- Atmospheric Vent: Interstitial Space Only
- Tank Gauge
- Primary and Interstitial Emergency Vents
- Battery Operated High Level Alarm
- Replace all plastic shipping plugs and caps with steel (Typ)
- Delivery Driver Warning Sign to be located on Sollard near fill
- 6" Min. from AST to edge of concrete (Typ)
- 1,000-Gallon Gasoline AST
- 2,000-Gallon Diesel AST
- Gasboy Astra Pump Cabinet
- BJ Leakguard Interstitial Leak Detector
- AST Mounted Gasboy Astra Dispenser
- Plug existing openings not to be used
- New HH Retractors and Hanging Hardware
- Integral Fill Box
- Tank level at 50%
- 6" from AST bottom (Typ)

Fueling Area Elevation

#4 Deformed Reinforcement 12" spacing each way

3/8" = 1'-0"
STANDARDS AND GUIDELINES

Consolidated Regulations or Standards Do Not Exist

Regulations

- SPCC Regulations For Petroleum (40 CFR 112)
- They do not provide technical construction guidance
SUMMARY OF STANDARDS AND CODES APPLICABLE TO ABOVEGROUND STORAGE TANKS

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS


STEEL TANK INSTITUTE (STI) STANDARDS

- **STI SP001-11** “Standard for Inspection of Aboveground Storage Tanks (2011)
SUMMARY OF STANDARDS AND CODES APPLICABLE TO ABOVEGROUND STORAGE TANKS

PETROLEUM EQUIPMENT INSTITUTE (PEI)


AMERICAN PETROLEUM INSTITUTE (API) STANDARDS


(c) Provide appropriate containment and/or diversionary structures to prevent discharge; entire containment system including walls must be capable of containing oil such that a release from the primary will not escape before cleanup occurs; at a minimum use one of the following prevention systems or its equivalent for onshore facilities:

(i) Dikes, berms, retaining walls sufficiently impervious
(ii) Curbing
(iii) Culverting, gutters, or other drainage systems
(iv) Weirs, booms or other barriers
(v) Spill diversion ponds
(vi) Retention ponds
(vii) Sorbent materials
Secondary Containment?
Any Issues Here?
SPACE AVAILABILITY AND ACCESSIBILITY

- Secondary Containment design may need more space than is available
  - Pre-fabricated designs take less space
- Deliveries are made via pressurized pumping
  - Need to ensure both ends of the delivery are managed
  - Tank needs to be accessible for deliveries
PROPER PLACEMENT OF TANKS

- Distance From Buildings
- Distance From Property Lines
- Distance from Dispensers
- Spacing Between Tanks

NOTE: Your local fire official may be the controlling agency.
Know The Flow Direction If A Spill Occurs
SECONDARY CONTAINMENT

- Clay or Earthen Dike
- Steel Dike with or without Rain Shields
- Tanks in Underground Vaults
- Double Wall Tank 300 Degrees
- Double Wall Tank 360 Degrees
TYPES OF TANKS

- **Off-ground Versus On-ground**
  - Totally aboveground tanks can be easily inspected.
  - On-ground tanks which must be taken out of service to be inspected.
  - Tanks in underground vaults, are aboveground tanks.
Aboveground Tank??
AST IN A UNDERGROUND VAULT
Open Dike vs. Double Wall
Secondary containment may mean “collection of rainwater”

- Divert or protect against water collection
  - Use Double Wall Tanks
  - Use roofs or shields

- Easy to address if a wastewater handling mechanism is already onsite
  - POTW
  - Oil/water Separator

- May have a surface discharge requiring a permit
Rain Protection?
Problems With Dike Tanks

- Removal of water
  (Clean or Contaminated?)
- Proper inspections
- Maintain dike condition
Problems With Dike Tanks
What Do You Need On a Double wall AST?

- Spill Bucket
- Overfill Device
  - Overfill Prevention Valve
  - High Level Alarm
- Level Gauge
What Does A Double Wall Tank Need?

Spill Bucket
What Does A Double Wall Tank Need?

Overfill Alarm (90%)

CONTRACTOR TO FIELD MOUNT EQUIPMENT SECURELY ON A RIGID ALUMINUM MOUNTING BOARD AND SECURELY FASTEN BOARD TO CONTRACTOR SUPPLIED SUPPORT PIPES IN LOCATION SPECIFIED ON DRAWINGS D-3

EMERGENCY SIGNAGE, ALL SIGNAGE SHALL COMPLY WITH NFPA REQUIREMENTS

OVERFILL ALARM
WHEN ALARM SOUNDS
TANK IS FULL

FINISH GRADE

ACKNOWLEDGEMENT SWITCH AND TEST BUTTON

ALUMINUM MOUNTING BOARD
What Does A Double Wall Tank Need?

Overfill Prevention (95%)
What Does A Double Wall Tank Need?

Tank Gauge
What Does A Double Wall Tank Need?

- Means To Determine Secondary
Tank Design and Compliance with 112.8 of SPCC Regulations

(c) Bulk Storage Tanks

- Engineer with good engineering practice and provide at least one of the following devices:
  - High level alarms with audible or visual signal
  - High level pump cutoffs
  - Direct audible or code signal communication
  - Fast response system with a person monitoring at all times during filling
  - Test level devices regularly for proper operation
All Types of Tanks and Containers
ConVault Tank

1. Fuel Dispenser
2. Level Indicator
3. Steel Primary Tank
4. Polystyrene Layer
5. HDPE Liner
6. Reinforced Concrete
7. Support Legs
8. Internal Bracing
9. Atmospheric Vent
10. Leak Detector Tube
11. Overfill Containment
12. Emergency Vent
13. Concrete Slab
THE RIGHT EQUIPMENT

- Secondary Containment
- Proper Venting
- Protection/Security
- Release Detection
- Overfill Prevention
- Anti-Siphon Valve or Solenoid Valves
Do We Have Line Leak Detection?
TANK ANCHORS
112.7 (a)(3)(ii) – Product Transfer Procedures - Delivery Instructions in Plan and Posted

DRIVER WARNING

DO NOT INITIATE FUEL OR OIL TRANSFERS PRIOR TO CHECKING IN WITH FACILITY PERSONNEL.

Tank Truck Drivers are responsible for following DOT Procedures
(49 CFR Parts 177.834 and 177.837)

- Shut down engine unless used for transfer pumping operation
- Set brakes and chock wheels prior to and for the duration of all fuel and oil transfers
- Perform bonding/grounding prior to fuel and oil transfers, if necessary
- No smoking during fuel and oil transfers
- Use drip pails below hose connections during fuel and oil transfers
- Remain within 25 feet and maintain an unobstructed view of cargo tank and hose at all times during fuel and oil transfers
- Inspect vehicle drains and outlets for leakage prior to loading and prior to vehicle departure; make necessary adjustments or repairs prior to departure
- Verify complete disconnect of hoses and bonding/grounding prior to removal of wheel chocks

DO NOT DEPART PRIOR TO CHECKING OUT WITH FACILITY PERSONNEL
**SPILL PREVENTION PROCEDURES**

ALL FUEL TRUCKS
REMEMBER TO
DISCONNECT ALL LINES
AND SECURE
VALVES BEFORE
DEPARTURE.

**TANK #3**
PRODUCT: DIESEL
DESIGN CAP: 20,000 GALS.
WORKING CAP: 18,000 GALS.
TANK DIAMETER: 126°

**TANK #1**
PRODUCT: DIESEL
DESIGN CAP: 20,000 GALS.
WORKING CAP: 18,000 GALS.
TANK DIAMETER: 126°

**TANK #4**
PRODUCT: DIESEL
DESIGN CAP: 20,000 GALS.
WORKING CAP: 18,000 GALS.
TANK DIAMETER: 126°

**TANK #2**
PRODUCT: DIESEL
DESIGN CAP: 20,000 GALS.
WORKING CAP: 18,000 GALS.
TANK DIAMETER: 126°
Tank Design and Compliance with 112.7 of SPCC Regulations

(e) Inspections, Tests and Records

- Written procedures for inspections with records
  - Procedures
  - Schedule/frequency
  - Types of equipment
  - Persons conducting
  - Recordkeeping

- Made part of the plan and maintained for 5 years
Tank Design and Compliance with 112.7 of SPCC Regulations

(g) Security

- Facility storing oil must be fully fenced and/or locked and/or guarded when unattended;
- All equipment must be secured;
- Ensure that master flow and drain valves so that they remain closed when in non-operating status;
- Lock starter controls in off position;
- Securely cap or blank-flange the loading/unloading connections of piping when not in use for extended periods of time;
- Provide adequate lighting to ensure discovery of discharges;
- Lighting may be required;
SECURITY 112.7 (g)

- Describe how you secure and control access to the 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
  - Address the appropriateness of security lighting to both prevent acts of vandalism and assist in discovery of oil discharges
AESTHETICS AND SECURITY

- ASTs may be more visible to the public
  - Consider camouflage or painting
  - Inside construction – concern for codes and accessibility
- Security concerns
  - Fencing may be required
  - Lighting may be required
Vehicle Protection
INSPECTION DETAILS

- Inspection Criteria
- How Often?
- What Are You Looking For?
- What Tools Do You Need?
- What Types Of Inspections?
- Type of Tanks
Inspection and Testing Intervals

- SP001 categorizes ASTs:
  1 - with spill control and leak detection
  2 – with spill control – no leak detection
  3 – without spill control or leak detection

- Matrix of Inspection and Testing requirements based on Category and tank size
INSPECTION/TEST DESIGNATIONS

P – Periodic by Owner

E – Formal external by Certified Inspector

I – Formal Internal by Certified Inspector

L – Leak Test by Owner
## Examples of Tank Configuration

<table>
<thead>
<tr>
<th>Tank Configuration</th>
<th>Tank has CRDM</th>
<th>Tank Has Spill Control</th>
<th>AST Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW AST in contact with ground</td>
<td>no</td>
<td>no</td>
<td>3</td>
</tr>
<tr>
<td>SW AST in contact with ground</td>
<td>no</td>
<td>yes</td>
<td>2</td>
</tr>
<tr>
<td>Elevated Tank</td>
<td>yes</td>
<td>yes</td>
<td>1</td>
</tr>
<tr>
<td>AST Double Bottom</td>
<td>yes</td>
<td>yes</td>
<td>1</td>
</tr>
<tr>
<td>DW AST with overfill prevention</td>
<td>yes</td>
<td>yes</td>
<td>1</td>
</tr>
<tr>
<td>DW AST without overfill prevention</td>
<td>yes</td>
<td>no</td>
<td>3</td>
</tr>
</tbody>
</table>

**CRDM:** Continuous Leak Detection Method
## INSPECTION SCHEDULE

<table>
<thead>
<tr>
<th>Tank Size</th>
<th>Cat 1</th>
<th>Cat 2</th>
<th>Cat 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shop Built Tanks</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 – 1,100</td>
<td>P</td>
<td>P</td>
<td>P, E&amp;L (10)</td>
</tr>
<tr>
<td>1,101 – 5,000</td>
<td>P</td>
<td>P, E&amp;L (10)</td>
<td>(P, E&amp;L (5), I(10)) or (P, E(5) &amp; L(2))</td>
</tr>
<tr>
<td>5,001 – 30,000</td>
<td>P, E(20)</td>
<td>(P, E(10) &amp; I(20)) or (P, E(5) &amp; L(10))</td>
<td>(P, E&amp;L (5), I(10)) or (P, E(5) &amp; L(1))</td>
</tr>
<tr>
<td>30,000 – 50,000</td>
<td>P, E(20)</td>
<td>(P, E&amp;L(5) I(15))</td>
<td>(P, E&amp;L(5) I(10))</td>
</tr>
<tr>
<td><strong>Portable Containers</strong></td>
<td>P</td>
<td>P</td>
<td>P**</td>
</tr>
</tbody>
</table>

**P**-Periodic Insp. by Owner  
**E**-External Insp. by Cert. Inspector  
**I**-Internal Inspection  
**L**-Leak Test
INSPECTION CHECKLISTS

- CHECKLIST DESIGNED FOR PERIODIC INSPECTION
  - DAILY
  - WEEKLY
  - MONTHLY AND QUARTERLY
  - SEMI-ANNUALLY
  - ANNUALLY

- INCLUDES COMMENTS AND ITEMS TO BE CORRECTED
INSPECTION REQUIREMENTS

- Inspection Criteria May Be Required By Regulations or By Industry Codes and Standards
  - Industry Codes
    - Pre-Manufactured Tanks
      - Steel Tank Institute (STI) SP001-11
    - Field Fabricated
      - American Petroleum Institute (API) 653
INSPECTION INTERVALS

ROUTINE IN-SERVICE

- Conducted by facility personnel at least every month.
- State regulations may be more stringent (Daily).
- Annual inspections, conduct by someone other than the person who performs the monthly inspection.
- Integrity Inspection (Type of inspection will depend on the type of tank; off ground or on ground).
  - Off-Ground: Could be every 20 years, or less depending on professional judgment.
  - On-Ground: Could be every 1 to 20 years depending on the type of tank, location, and professional judgment.
INSPECTION INTERVALS

- INTEGRITY INSPECTION (Third Party Inspections)
  - Conducted by authorized inspector (API 653, STI, or other qualified individual).
  - SPCC Plan will determine integrity inspection schedule on small manufactured AST.
  - One API ASTs interval shall be 5 years or the quarter corrosion rate life of the tank shell, whichever is less.
CONTAINER AND EQUIPMENT INSPECTIONS
AND TESTING PROGRAM

<table>
<thead>
<tr>
<th>Facility Component</th>
<th>Action</th>
<th>Frequency/Circumstances</th>
</tr>
</thead>
<tbody>
<tr>
<td>All aboveground valves, piping and appurtenances</td>
<td>Assess general condition of items, such as flange joints, expansion joints, valves, catch pans, pipeline supports, locking of valves and metal surfaces.</td>
<td>Monthly</td>
</tr>
<tr>
<td>Monitoring system</td>
<td>Test for proper operation</td>
<td>Monthly by facility personnel, annual by certified installer who should inspect and test all sensors and level gages.</td>
</tr>
<tr>
<td>Oil/Water separator</td>
<td>Clean out</td>
<td>Annually or as required.</td>
</tr>
<tr>
<td>Buried Piping</td>
<td>Testing</td>
<td>Annually</td>
</tr>
</tbody>
</table>
WHAT ARE WE LOOKING FOR?

- Leaks and Spills
- Damaged or Worn Components
  - Piping Supports
  - Paint
  - Pumps
  - Alarms
- Labeling
- Spill Supplies
Piping Support
WHAT ARE WE LOOKING FOR?

- Proper Venting
  - Primary Venting
  - Emergency Venting
- Gauging
  - Visual
  - Electronic
- Tank Anchors
- Proper Grounding
Paint Condition
Check Stairways and Ladders
Proper Signage
Secondary Monitoring
RECORDS

- Copies of Past Inspections
- Installation Documentation
- Maintenance Records
- Leak Detection Records
- Registration and Permits
Active Measures

- Active containment measures require deployment or other specific action by the owner or operator.
- May be appropriate for discharges that occur during manned activities if it:
  - Can contain the volume and rate of oil
  - Is properly constructed
  - Is deployed in a timely manner
Confirm Spill Kits are On Site Wherever Needed and Fully Stocked
The Effect of Time On ASTs