

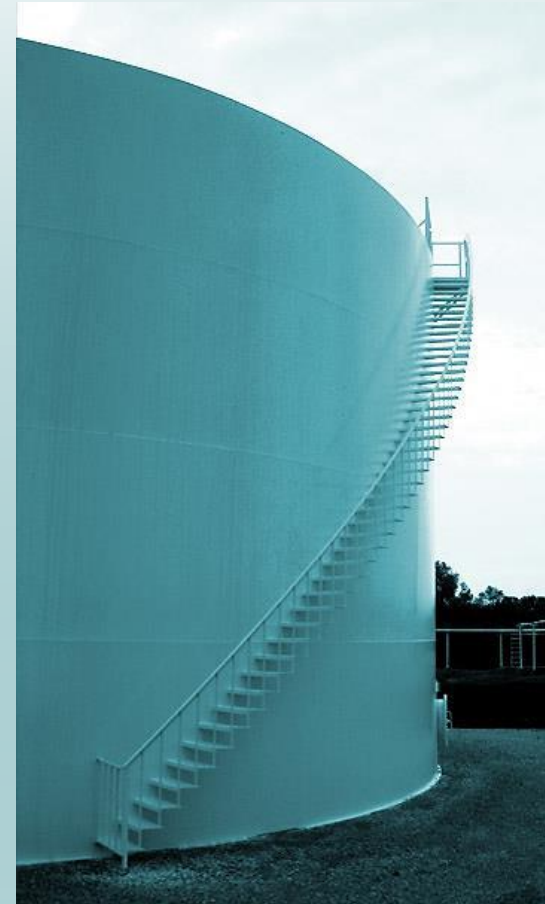


***FLUID FERTILIZER
TECHNOLOGY WORKSHOP
STORAGE TANK MAINTENANCE & MONITORING
INTERNAL TANK LINERS***

***December 8, 2015 - Louisville, Kentucky
Chris Brooks***

ABOVE GROUND STORAGE TANK MAINTENANCE & MONITORING

- Why owners should perform visual inspections on a regular basis
- Why owners should have an API-653 inspection
- When should owners have an API-653 inspection
- Who is an API-653 Inspector
- What is included in an API-653 inspection
- What CAN happen





Shop built as well as field erected tanks should be inspected





OWNER CONDUCTED INSPECTIONS

- Regular on-site (owner performed) inspections provide a proactive way to minimize or prevent repair costs
 - Reduce down time for repairs
 - Prevent and/or reduce leakage into containment
 - Prevent potential product release into ground and water environments
 - Reduce down-time for repairs and prevent loss of product
 - Limit corrosion acceleration to external areas
-
-

OWNER CONDUCTED INSPECTIONS

- Monthly inspections should monitor the external coating on the tank shell and roof, the overall condition of the tank, piping, secondary containment and ancillary equipment.
 - Drainage issues or loss of foundation from washout
 - Weekly inspections should include stains on the steel, dead grass or other indications a leak may be present.
 - Testing of leak monitor valves
-
-







Regular owner performed visual inspections could prevent down time and out-of-service issues that may arise.



What a Liner Should Look Like



Why API-653 Inspections

- Establish a baseline of condition, corrosion rate and remaining life of steel
- Provide detail on mandatory and discretionary repairs
- Meets or exceeds state regulatory requirements for permit renewal

When to have an API-653 Inspection Performed

The Fertilizer Institute Recommendations

As an initial baseline a complete API 653 out-of-service internal and external inspection shall be performed to establish the condition of an existing AST and to determine the AST's suitability for continued service.

For non coated tanks or tanks without bladders, an internal inspection using the API 653 checklist should be conducted by an API authorized inspector at frequencies recommended by API 653 or RBI assessment.

The tank should be given an *inspection by an API authorized inspector at intervals not greater than the lesser of five years or the interval established by the corrosion rate in accordance with API-653

What is Included in an API-653 Inspection

- Ultrasonic Thickness (UT) testing of all shell, roof and floor plates
 - Vacuum testing of all floor weld seams unless coated
 - Visual inspection of plates, welds, appurtenances and ancillary equipment
 - Settlement Survey
 - Provide calculations for safe or maximum fill height
-
-

Who is an API-653 Inspector



- Must pass a written exam conducted by the American Petroleum Institute (API)
- Recertification is required every six years
 - Inspectors must not only maintain a minimum standard of knowledge but present an understanding of new codes and protocols.
- Certified inspectors receive an individual inspector number

What is Included in an API-653 Inspection

Check for code violations including 4 way junctions, improperly installed shell inserts, and weld spacing









Sludge and deep deposits may require sandblasting to remove

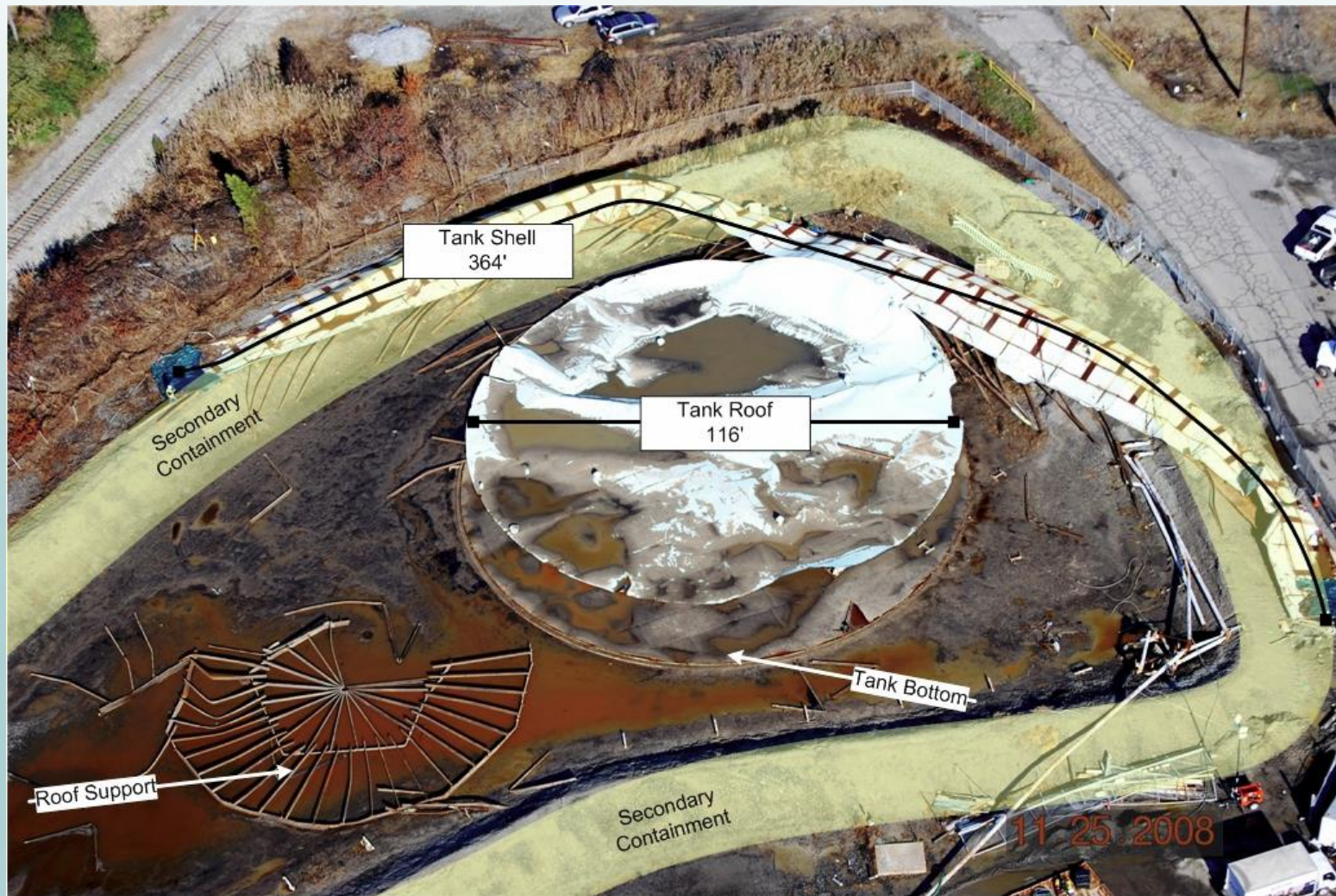


**Settlement issues created rafters twisting
and required a full roof replacement**





Tanks that are not inspected are at risk for **WHAT CAN HAPPEN**











Protecting Your ASSETS

- Inspections provide a safety margin of security
 - Identify repairs before they become significant
 - Prevent delays and fines in permit renewal
 - Tanks without internal containment liners should be cleaned every 2-3 years
 - Full internal and external API-653 Inspections should be completed every 5 years
 - All repairs should be made to API-653 standards
-
-

Questions?

