

EPA Rule Update: A Long Trail



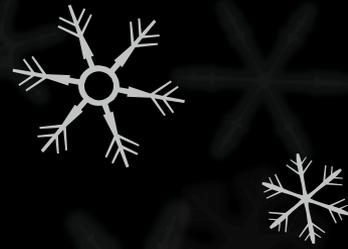


New Federal EPA Requirements

- Secondary containment requirements for new and replaced tanks and piping
- Operator training requirements
- Updating codes of practice
- Periodic operation and maintenance requirements for UST systems



- Requirements for compatibility before storing certain biofuel blends
- Removing deferrals for emergency generator tanks, airport hydrant systems, and field-constructed tanks
- Making editorial and technical corrections



Rule Changes Needed

- Owners and operators must replace the entire piping run when 50 percent or more of piping is replaced
- **Spill bucket testing every 3 years (unless double wall with monitoring)**
- Double wall containment sumps with monitoring, no testing required
- **No longer allow ball floats**



Rule Changes Needed

- Inspection of overfill prevention equipment every 3 years
- Annual operation and maintenance tests on electronic and mechanical release detection devices
- Monthly walk through inspections
- Annual operational and maintenance inspections

Monthly walk through inspections

- Visually check spill containment – for damage and remove liquid and debris
- **Check for/remove any obstruction in fill pipe**
- Check fill cap to ensure securely in fill pipe
- **If double wall spill containment, check leak detection**
- Check release detection equipment for alarms, unusual operating conditions and ensure release detection records re reviewed and current

Annual Operational and Maintenance Inspections

- Visually check containment sumps for damage
- **Check hand held release detection devices for operability**
- Done in addition to monthly walk through inspection



What Testing is Allowed for Sumps and Spill buckets?

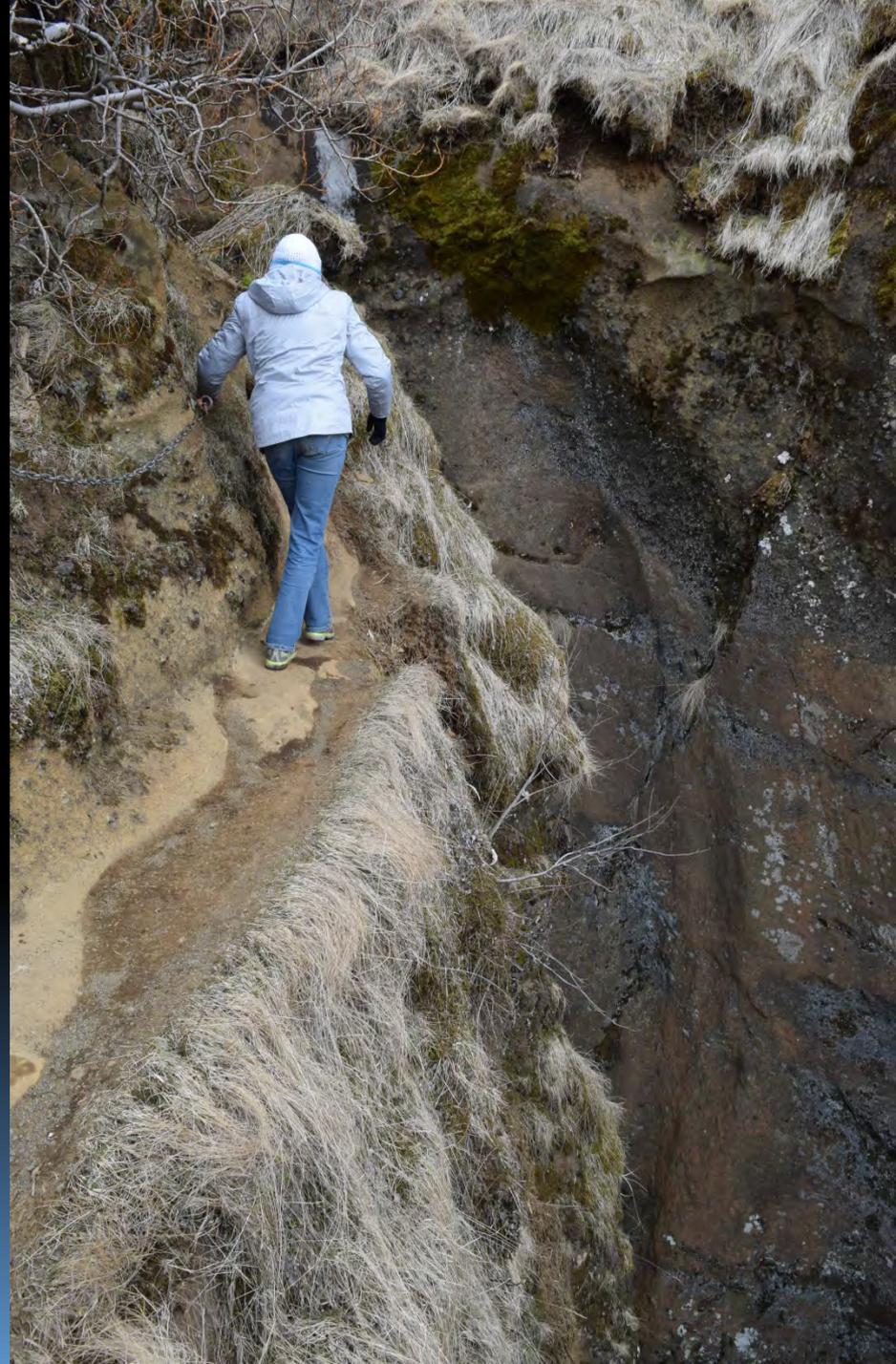
- Typically hydrostatic or vacuum testing
- Testing using one of the following:
 - Requirements developed by manufacturer
 - Code of practice
 - PEI RP1200 *Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities.*

What now?

Stakeholder
meetings

Rulemaking

Application
for Program
Approval

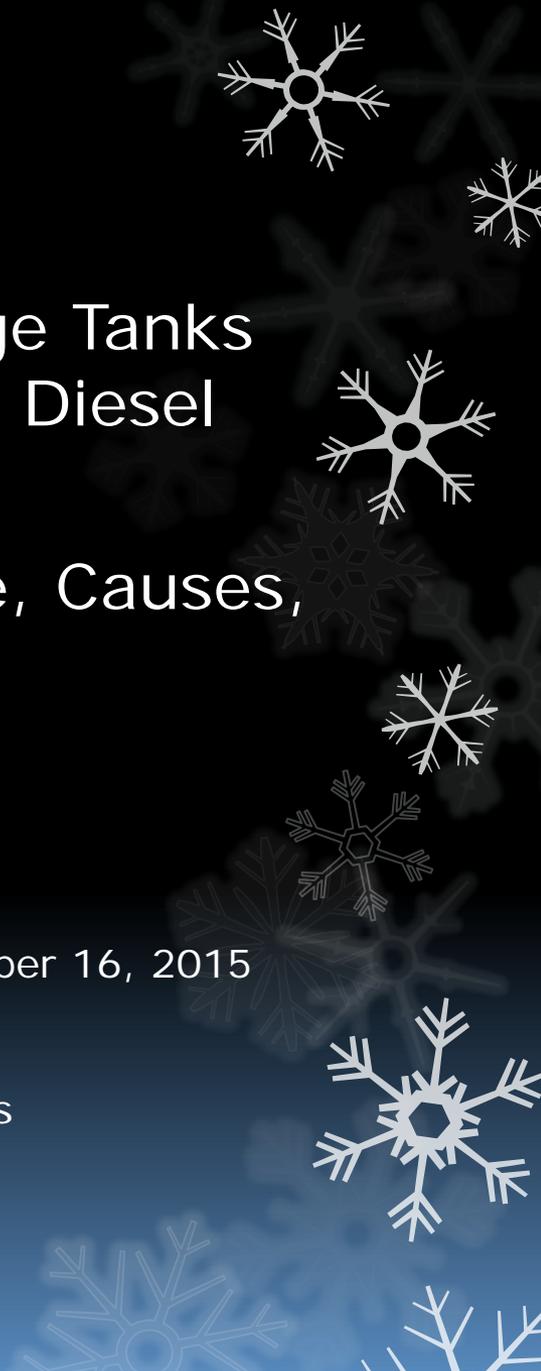












Corrosion in Underground Storage Tanks (USTs) Storing Ultra-Low Sulfur Diesel (ULSD):

EPA Research on Risks, Prevalence, Causes, and Next Steps

Presented at the National Tanks Conference September 16, 2015

Ryan Haerer

EPA Office of Underground Storage Tanks

Corrosion Risks to the Environment – Exposed Metals in the Vapor Space

Release prevention equipment could fail to function

- Corrosion on flapper valves could restrict movement and allow an overflow
- Product level floats get stuck on corroded shafts and fail to signal a rising product level, fuel release, or water infiltration
- Ball float valves – ball or cage may corrode
- Line leak detectors failing performance testing at higher rates



Corrosion **Risks** to the Environment – Bottoms of Tanks



Metal components could corrode completely and possibly release fuel to environment

- ULSD prone to collect water and sludge in bottom of tanks
- Some states seeing much higher rates of bottom failures of primary walls of double-wall steel tank bottoms since ULSD
- Single-wall tanks possibly leaking undetected



A Closer Look at ULSD

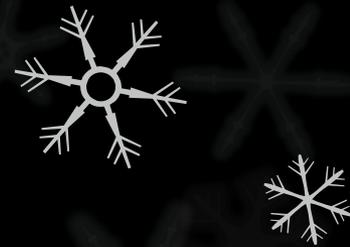
From National Tanks Conference

Presented by

Mahesh Albuquerque

Director

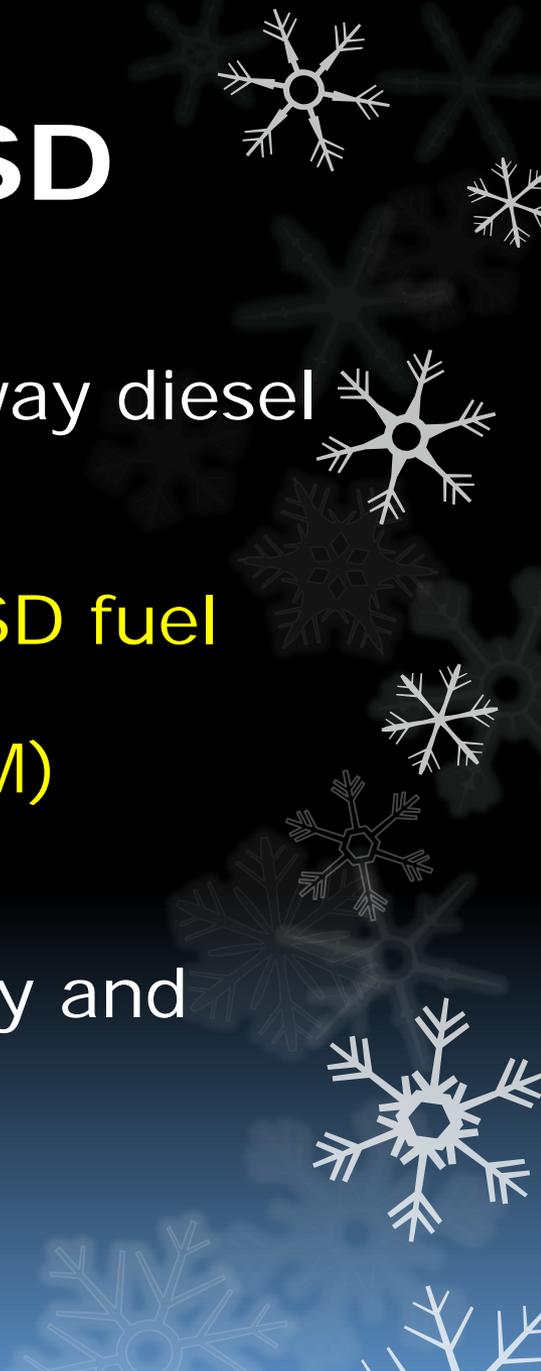
Colorado Department of Labor and Employment



Highway Diesel Rule

- In 2001, EPA's Highway Diesel Rule was finalized. Intended to make heavy-duty trucks and buses run cleaner.
- Required a 97% reduction in the sulfur content of highway diesel fuel from 500 ppm (low sulfur diesel, or LSD) to 15 parts per million (ultra-low sulfur diesel, or ULSD).
- Refiners began producing the cleaner-burning diesel fuel, ULSD, for use in highway vehicles beginning June 1, 2006.

Phase-in of ULSD



- ULSD was phased in for Highway diesel fuel from 2006-2010.
- Low sulfur (500 ppm) and ULSD fuel was phased in for Nonroad, Locomotive, and Marine (NRLM) engines from 2007-2014.
- Since 2014, all diesel (Highway and NRLM) should be ULSD.

Field Observations Since 2006

- Fuel seeps and leaks around certain gasket fittings in UST systems storing and dispensing ULSD
- Need to replace dispenser fuel filters more frequently due to clogging with particulates or biomass
- Erratic operation or failure of tank and line monitoring equipment due to rust buildup
- An increase in the number of ULSD systems showing internal corrosion
- Minimal external evidence of corrosion

Fuel Instability

- Involves the chemical conversion of precursors to species of higher molecular weight with limited fuel solubility.
- Tend to be nitrogen and sulfur-containing compounds, organic acids and reactive olefins.
- Conversion process often involves oxidation of the precursors.
- Dissolved metals, especially copper, contribute by functioning as oxidation catalysts.



Blending with Biodiesel

- Biodiesel fuels degrade more rapidly than conventional diesel fuel and may lead to increased biological growth during storage.
- Biodiesel is also more susceptible to oxidative degradation than petroleum diesel.
- Contrary to intuition, two fuels that, by themselves, have good stability may form a less stable blend when they are combined.

Sulfur Content

- The presence of sulfur in diesel can have an adverse effect on microbial growth.
- As the sulfur content in diesel dropped from 500 ppm to 15ppm, the fuel's "antibiotic" properties diminish, possibly allowing for more microbial activity.

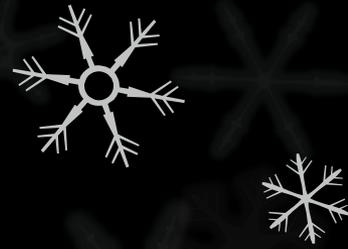


Sludge from ULSD UST



Lubricity

- Lubricity of diesel fuel decreases as sulfur is removed during the refining process.
- To compensate for this loss, lubricity additives are blended into ULSD to minimize engine wear.
- The net effect is that ULSD fuel may not be compatible with certain non-metallic seals and gaskets.



Oxidation Stability

- The natural anti-oxidation properties of diesel fuel also decrease as sulfur is removed during the refining process.
- ULSD, without the natural oxidation inhibitors which are removed by hydrotreating, may form peroxides during long-term storage.
- Biodiesel is also more susceptible to oxidative degradation than petroleum diesel.
- Can result in the buildup of oxidation products, commonly seen as rust or sediment buildup.



ULSD STP



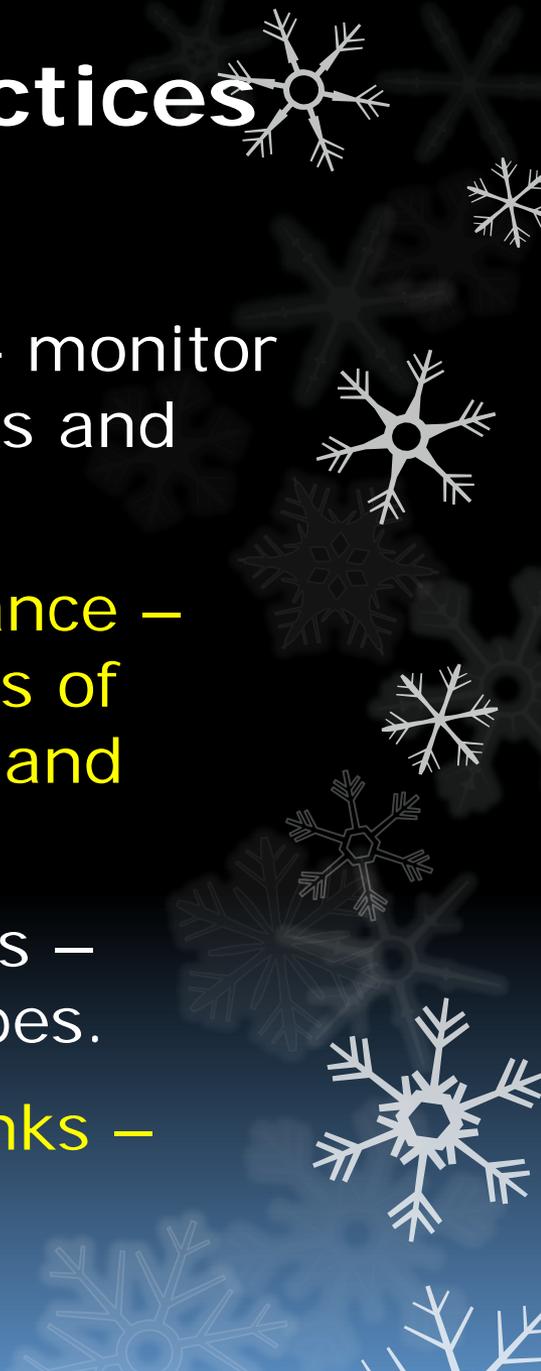
Photo courtesy of NJ DEP

ALLD Spring and Piston



Photo courtesy of NJ DEP

Best Management Practices



- Aggressive Water Management – monitor for the presence of water in tanks and remove water bottoms promptly.
- Periodic Inspection and Maintenance – monthly walk-through inspections of dispenser cabinets, spill buckets and sumps.
- Periodic Internal Tank Inspections – remove drop tubes and ATG probes.
- Minimize Stagnant Product in Tanks – aged product degrades.

Storing ULSD for a Long Time



- Purchase clean, dry fuel from a reputable supplier and keep the stored fuel cool and dry.
- Presence of free water encourages the corrosion of metal storage tanks and provides the medium for microbiological growth.
- Add an appropriate stabilizer that contains an antioxidant, biocide and corrosion inhibitor.
- Regularly test the fuel, and add fresh stabilizer as necessary.