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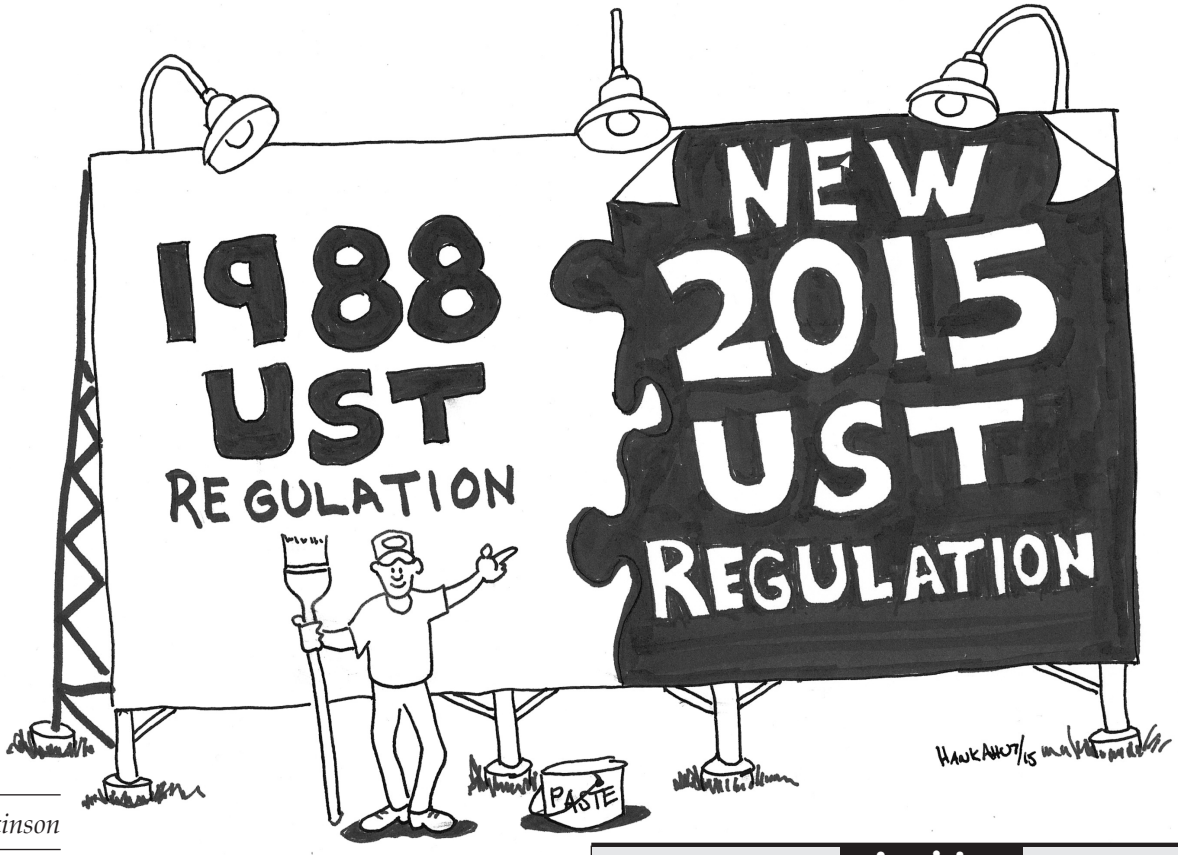
L.U.S.T.LINE

A Report On Federal & State Programs To Control Leaking Underground Storage Tanks

TA-DA!

Meet the 2015 Revised UST Regulation



Carolyn Hoskinson

At long last, USEPA has issued the 2015 underground storage tank (UST) regulation (www.epa.gov/oust/fedlaws/revregs.html). The regulation is available in the July 15, 2015 Federal Register. *After many years of work and collaboration with stakeholders, this regulation is final—and I am happy I can now say that. I think the old English proverb "Good things come to those who wait" applies here. And these changes are definitely good for the environment.*

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Inside

■ Revised UST Regulation

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As you can imagine, we feel a great sense of accomplishment. Of course, we are well aware that this is only the beginning. Implementation is next, and that means significant work ahead for USEPA, state and territorial UST programs, tribal UST programs, owners and operators, equipment manufacturers, vendors, and others. Our next steps to implement the 2015 UST regulation will result in greater protection for human health and the environment; these changes are designed to further reduce the number of releases to the environment and help ensure earlier detection of releases, if they occur.

Why Did USEPA Revise the 1988 UST Regulation?

As you know, the 1988 UST regulation guided us in preventing releases, detecting releases, and cleaning up those that occurred. This original regulation was an excellent start for setting minimum standards for UST systems and protecting groundwater.

L.U.S.T.Line

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Carolyn Hoskinson
Director, USEPA's Office of Underground Storage Tanks

The 1988 regulation required owners and operators to have spill, overfill, and release detection equipment in place for their UST systems, but it did not address operation and maintenance of that equipment. In addition, the 1988 regulation was based on technologies that are now more than 25 years old and deferred some UST systems because release detection was not readily available for those systems decades ago. The Energy Policy Act of 2005 included key requirements, such as secondary containment and operator training, for states and territories that receive Leaking Underground Storage Tank Trust Fund money. However, those requirements did not apply in Indian country, leaving an inequity in environmental protection in Indian country. These factors contributed to our decision to update the federal UST requirements, which will apply in Indian country as well.

But in the 25 plus years since USEPA established that regulation, much has changed. We gained significant experience from addressing tank systems, we saw improved technologies for tank systems, and we have a greater awareness of the need for proper operation an d maintenance. Many states had already recognized these issues and implemented more stringent requirements.

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What Are the Major Changes in the 2015 UST Regulation?

The 2015 UST regulation will help prevent and detect UST releases, which are one of the leading sources of groundwater contamination. When the changes are implemented, people's health and our country's environment will be better protected from UST releases.

The regulation requires that UST equipment is operated and maintained properly; acknowledges improvements in technology over the past 25 plus years by including newer technologies and adding requirements to detect releases from UST systems deferred in the 1988 regulation; and adds requirements for UST secondary containment and operator training.

Because states and territories are the primary implementers of the UST program, and in some instances, their requirements are more stringent

than the federal UST regulation, UST owners and operators in some states may already meet many of the 2015 UST requirements. For other states and in Indian country, these changes will set more protective standards to prevent and detect releases more quickly, and this will limit impacts to vital groundwater resources.

In particular, the 2015 UST regulation revises 40 CFR part 280 by:

- **Adding federal requirements for operator training.** The Energy Policy Act of 2005 required operator training, and most states require operator training. Now, however, this is a requirement for USTs in Indian country and those states not previously requiring it. Operator training is a way to educate UST system operators and help them better prevent releases by complying with requirements.
- **Adding federal requirements for secondary containment for new and replaced tanks and piping.** The Energy Policy Act of 2005 required secondary containment, and most states require secondary containment. However, the 2015 UST regulation now requires it for USTs in Indian country and those states not previously requiring it. Secondary containment will reduce releases to the environment by containing them in secondary areas and detecting them before they reach the environment.
- **Establishing additional requirements for operation and maintenance of UST system equipment.** These new requirements include walkthrough inspections, spill prevention equipment testing, overfill prevention equipment inspections, testing for containment sumps used for piping interstitial monitoring, and release detection equipment testing.

  Although appropriate UST system equipment is essentially in place, we realized the need to ensure owners and operators properly operate and maintain their equipment. These additional requirements highlight the importance of operating and maintaining UST equipment so releases to the environment are prevented or quickly detected.

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- **Requiring owners and operators of UST systems storing fuel for use by emergency power generators to perform release detection.** USEPA removed the deferral and, within three years, requires owners and operators to begin performing release detection. These UST systems must already meet all other parts of the UST regulation.
- **Requiring that airport hydrant systems and field-constructed tanks meet requirements under the new subpart K.** In the 1988 UST regulation, USEPA deferred some USTs from most requirements, but we always intended to look at them again. Our analysis showed it is now appropriate to include those tanks in the federally regulated universe. Because of their unique nature, how they function, and their design, we tailored the regulatory requirements for airport hydrant systems and field-constructed tanks and consolidated them in one location, subpart K, of the 2015 UST regulation.
- **Partially excluding wastewater treatment tank systems, UST systems containing radioactive material, and UST systems that are part of emergency generator systems at nuclear power generation facilities,** which were deferred in the 1988 UST regulation. USEPA partially excluded these tanks from most of the UST regulation, but we continue to maintain installation requirements and require release response and corrective action for these UST systems.
- **Defining compatibility of emerging fuels and determining how owners demonstrate compatibility.** Section 280.32 of the 1988 UST regulation required that UST systems be compatible with the substances stored in them. Given the increased use of new and emerging fuels, such as biofuels and biodiesel, we thought it important to continue emphasizing new fuels and their compatibility with the systems in which they are stored.
- **Updating codes of practice.** This adds newer codes of practice, updates titles of codes of practice, and removes codes of practice that are not applicable or no longer exist.

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■ Revised UST Regulation
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- **Making editorial and technical corrections.** This corrects spelling, numbering, and other editorial errors.

How Are UST Owners and Operators Affected by Changes in the 2015 UST Regulation?

The changes in the 2015 UST regulation affect both small and large UST owners and operators, including owners and operators of USTs on tribal lands. The location of owners' and operators' UST systems, such as whether the systems are in Indian country, states with state program approval (SPA), or non-SPA states, determines when and how the 2015 UST regulation affects them. That means a subset of the 570,000 federally regulated USTs in the United States will immediately be subject to the 2015 UST regulation.

UST Owners and Operators in Indian Country

Owners and operators of UST systems in Indian country must comply with all 2015 UST requirements; this now includes operator training and secondary containment requirements, which did not previously apply in Indian country. The 2015 UST regulation fulfills objectives in USEPA's August 2006 UST Tribal Strategy, where both USEPA and tribes recognized the importance of requirements that ensure parity in program implementation among states and in Indian country.

UST Owners and Operators In SPA States and Territories

As of June 2015, 38 states as well as the District of Columbia and Puerto Rico have state program approval. Under SPA, state programs operate in lieu of the federal UST program. Owners and operators with UST systems in SPA states must continue to follow their state or territorial requirements. Those requirements remain in place until a state revises its requirements to meet the 2015 federal UST regulation. That means the 2015 UST regulation does not affect UST owners and operators in SPA states until those states either revise their UST requirements or their SPA status changes.

UST Owners and Operators in Non-SPA States and Territories

UST owners and operators in the remaining 16 non-SPA states and territories must meet both the 2015 UST requirements and their states' requirements. That means the 2015 UST regulation affects these non-SPA state owners and operators. In addition, owners and operators in those states must follow their states' UST requirements.

The changes in the 2015 UST regulation affect owners and operators whose UST systems were partially deferred, such as airport hydrant systems, field-constructed tanks, or UST systems storing fuel solely for use by emergency power generators, in the 1988 UST regulation.

Owners and Operators of Airport Hydrant Systems and Field-Constructed Tanks

The U.S. Department of Defense is one of the primary owners of airport hydrant systems and field-constructed tanks. Previously, the 1988 UST regulation required that airport hydrant systems and field-constructed tanks meet the interim prohibition requirements of subpart A (corrosion protected, made of non-corrodible materials, or otherwise designed and constructed to prevent releases during the operating life of the facility due to corrosion or structural failure) and release response and corrective action requirements of subpart F. Because of the unique nature of airport hydrant systems and field-constructed tanks and because they function and are designed differently than conventional USTs, we consolidated the regulatory requirements for these two categories in one location, subpart K, of the 2015 UST regulation. We think that owners and operators of airport hydrant systems are currently performing many of the requirements in the 2015 UST regulation and will only need to make minor modifications to their current practices.

Owners and Operators of UST Systems with Emergency Power Generators

Approximately 20 states currently require release detection for UST systems storing fuel solely for use by emergency power generators. USEPA deferred these systems from release detection in the 1988 UST regulation. Per the 2015 UST regulation, UST systems for use by emergency power generators must have release detection and secondary containment and use interstitial monitoring. We think the majority of federally owned emergency generator tanks already meet the release detection requirement.

How Are State and Territorial UST Programs Affected by the SPA Requirements?

State and Territorial UST Programs with SPA

The changes may require some state and territorial UST programs to modify their existing requirements, make them consistent with and at least as stringent as the 2015 UST regulation, and then reapply for state program approval. The 38 SPA states as well as the District of Columbia and Puerto Rico have three years to reapply for state program approval.

State and Territorial UST Programs without SPA

For the remaining 16 states and territories without state program approval, the 2015 UST regulation applies to UST system owners and operators. If in the future these states and territories want to obtain SPA, they may need to adjust their existing state regulations.

How Did We Determine Which Areas to Change?

Over the past three decades, USEPA's guiding principle in running the national UST program has been one of inclusion. We have always looked to you, our partners, for your thoughtful input and valuable expertise. So when it came time to figure out which areas of the 1988 UST regulation to change, we naturally reached out to a wide variety of stakeholders.

We elicited input and considered ideas from states, tribes, owners and operators, equipment manufacturers, environmentalists, and community groups. Your input helped us determine potential areas for change. And after extensive stakeholder outreach, we compiled a list of proposed changes that would most appropriately address gaps in

We are extremely excited about these program-altering changes, which strengthen UST prevention and detection practices, increase emphasis on properly operating and maintaining UST equipment, and ensure parity in implementing the national UST program. The 2015 UST regulation will allow us to better prevent and detect releases from UST systems. Because of this regulation, people's health and our country's environment will be better protected from UST releases.

the 1988 UST regulation and consider the latest technology.

We published proposed regulations in 2011 and accepted public comments over a five-month public comment period. After carefully analyzing all the comments, we developed the 2015 UST regulation, which USEPA published in the July 15, 2015 *Federal Register.*

Next Steps and What Do We Need from States, Owners, Industry, Others?

We now move to the implementation phase for the 2015 UST regulation. We are reaching out to our stakeholders and spreading the word; developing training and plain language documents to foster implementation; and enlisting the help of our partners to successfully implement the 2015 UST regulations.

We are extremely excited about these program-altering changes, which strengthen UST prevention and detection practices, increase emphasis on properly operating and maintaining UST equipment, and ensure parity in implementing the national UST program. The 2015 UST regulation will allow us to better prevent and detect releases from UST systems. Because of this regulation, people's health and our country's environment will be better protected from UST releases.

For more on the 2015 UST regulation, see USEPA's website, website, *www.epa.gov/oust*. ■

Want to hear about what USEPA is doing to protect, preserve, and clean up our land?

Follow @EPAland on Twitter. In addition to other subjects, you will also see some tweets about underground storage tanks.

At Last!

OUST's Petroleum Vapor Intrusion Guide

The USEPA's guide for addressing petroleum vapor intrusion (PVI), *Technical Guide For Addressing Petroleum Vapor Intrusion At Leaking Underground Storage Tank Sites,* EPA 510-R-15-001, is now available on the agency's website, *www.epa.gov/oust/cat/pvi/*. A USEPA Office of Underground Storage Tanks (OUST)-led workgroup developed the guide as a collaborative effort over a period of years, beginning in 2009. The project was initiated at the request of partners and stakeholders who felt that national guidance was needed to ensure vapor intrusion would be adequately considered and addressed at LUST sites. In addition to the input from the workgroup, OUST received helpful input during the 2013 public review period and 2014 interagency review.

The guidance will also help regulators, consultants, and other stakeholders avoid misinterpreting the potential for vapor intrusion and performing unnecessary investigations. Helping better target resources is critical given that more than 70,000 LUST sites are in the "cleanup pipeline." This technical guide is a companion to the USEPA Office of Solid Waste and Emergency Response's (OSWER's) more general vapor intrusion guide (see *www.epa.gov/oswer/vaporintrusion/*). Together, these two documents replace the 2002 draft vapor intrusion guide.

The PVI Guide

The PVI guide focuses on releases of PHCs from USTs regulated under 40 CFR part 280. It takes the aerobic biodegradation of PHCs into account and provides screening criteria based on physical separation distances between vapor sources and potential receptors. The screening criteria were derived by analyzing a large data set of samples from leaking UST sites. The PVI guide applies to new and existing releases of PHCs and non-PHC fuel additives from leaking USTs, as well as previously closed sites where the implementing agency has reason to suspect there may be a potential for PVI. Although USEPA developed the guide based on data from typical UST sites, it may also be helpful when addressing PHC contamination at comparable non-UST sites.

OSWER's More General VI Guide

The more general OSWER vapor intrusion guide addresses a wide variety of sites and a broader range of contaminants. It includes non-petroleum sites, as well as comingled plumes of petroleum and chlorinated solvents and petroleum contamination at sites that are not comparable to UST sites (e.g., refineries).

What Now?

OUST is planning to host a webinar about the PVI guide. Also, USEPA's Office of Research and Development (ORD) has developed several technical documents supporting the PVI guide (see *www.epa.gov/oust/cat/pvi/*). If you have questions, contact Hal White at white.hal@epa.gov. ■

Field Notes

from Robert N. Renkes, Executive Vice President, Petroleum Equipment Institute (PEI)

First Impressions on USEPA'S New UST Rule

Now that the U.S. Environmental Protection Agency's (USEPA's) first major update to its 1988 underground storage tank (UST) rule has been finalized, we'll be getting reactions from various corners of the UST-related world—regulators, tank owners/operators, equipment manufacturers, and service companies. So here's my initial take after listening to scores of tank owners/operators, equipment manufacturers, and service companies.

- **PEI Recommended Practices.** USEPA reviewed information from more than 25 code-making groups on more than 200 codes of practice that have been developed or revised since the 1988 UST regulation. USEPA reviewed PEI's *Recommended Practice for Testing and Verification of Spill, Overfill, Leak Detection and Spill Containment* (PEI/RP1200) and in the 2015 regulation included it in areas where testing or inspection is required. The agency also reviewed and included PEI's *Recommended Practice for the Inspection and Maintenance of UST Systems* (PEI/RP900) in the walkthrough inspections portion of the 2015 regulation.

  The warnings about the use of vent-restriction devices contained in Section 7.3.3 of PEI's *Recommended Practices for Installation of Underground Liquid Storage Systems* (PEI/RP100-11) were instrumental in USEPA's decision to no longer allow the use of flow restrictors for new UST system installations and when overfill prevention equipment is replaced.

  Including these documents in the federal rule is a credit to the dozens of men and women representing the equipment, UST owner/operators, and regulatory communities who unselfishly shared their time and knowledge to produce useful and widely accepted recommended practices. Thanks for all of you who participated in the process.

  All of PEI's recommended practices are reviewed and updated on a regular basis. The committee responsible for writing PEI/RP900 elected to wait until the final rule was published before updating their recommended practice. Now that the regulation is out, I expect work on the second edition of RP900 to begin this November. Look for both RP1200 and RP100 to be revised and available sometime during the first half of 2016.

- **Stakeholder Outreach.** UST technology has changed a great deal since the 1980s and the update to the regulation will help bring us up to date. USEPA's stakeholder outreach before publishing the 2011 proposed regulation was extensive. I know that because I attended all of the public meetings leading up to the publication of the proposed regulation. Furthermore, USEPA continued to meet with all interested stakeholders during and after the five-month comment period. The final rule demonstrates that USEPA sought input from the regulated community.

- **Periodic Testing of Secondary-Containment Tanks and Piping.** To date, USEPA's decision not to require the testing of these UST systems has raised the most eyebrows among PEI contractor members. PEI members almost unanimously agree that their tank-owner customers did not want to test secondarily contained tanks and piping because of the cost involved. They get that, and understand why USEPA made the decision they did given the comments in opposition to such a requirement in the original proposal. But PEI members don't believe that testing those systems creates a disincentive for owners and operators who care about keeping petroleum out of the ground and water from upgrading their systems with secondary containment.

- **Fair and Balanced.** It is obvious that USEPA carefully considered all of the comments submitted during the public comment period, including concerns regarding potential costs to small businesses, and worked to minimize those costs by making certain changes to the final UST regulation. No group got everything they wanted—they never do—but every tank owner association representative I have talked with so far says they can live with the final rule. In full disclosure, I did not talk with any implementing agency before I wrote this column. I figure they are too busy trying to determine what the rule means to their program.

- **Prognosticating.** I read all of the comments submitted to USEPA on the proposed regulation that ended April 16, 2012. After analyzing those comments, I wrote an article for the Third Quarter 2012 *PEI Journal* where I drew my own conclusions about what changes might or might not be reflected in the final regulations. Bottom line: I got 72 percent correct. That would equate to an unheard of batting average in baseball or result in a once-in-a lifetime field goal percentage in basketball, but if we were in school I would be average at best. I plan to do better next time. ■

Tank-nically Speaking

by Marcel Moreau

*Marcel Moreau is a nationally recognized petroleum storage specialist whose column, **Tank-nically Speaking**, is a regular feature of* LUSTLine*. As always, we welcome your comments and questions. If there are technical issues that you would like to have Marcel discuss, let him know at* **marcel.moreau@juno.com.**

Of Saws, Hammers, and Leak Detection

Why Inventory Can't Find Leaks in Satellite Piping

The preamble to the federal rule, published over a quarter century ago, stated that all the methods of leak detection described in the rule, "appear to be successfully detecting releases when properly applied."[1] The USEPA's position at the time was that all leak detection methods included in the federal rule would work equally well if the guidelines presented in the rules were followed.

Policy versus Science

While equality among leak detection methods may be politically correct from a rule-writing perspective, it is not scientifically correct from a physics perspective. For example, groundwater monitoring is founded on vastly different principles than automatic tank gauging. A tank-tightness test is worlds away from inventory control as a leak detection method. The actual mechanics of how leak detection methods work require that different methods have different abilities to detect different types of leaks. Although any of the leak detection methods described in the federal rule may be used to comply with the regulations (assuming all the guidelines in the regulations are followed), the magnitude and locations of the leaks that can be detected by these different methods vary greatly.

This was brought home to me by a recent query from a regulator who wondered why line-leak detectors could be used for leak detection on the satellite piping that runs between the master and the satellite dispenser at a truck stop but statistical inventory reconciliation (SIR) could not. As I thought about my answer, I realized that part of the regulator's issue was taking the regulatory philosophy that all leak detection methods are effective a bit too literally, combined with an understanding of the workings of various leak detection methods that was a bit too shallow.

Why I'm Writing this Article

I have two goals in writing this article: first, to point out that all leak detection methods are not created equal, and second, to provide a concrete example by discussing why it is that line-leak detectors can find leaks in satellite piping but inventory-control-based methods of leak detection, whether traditional, SIR, or automated, cannot.[2]

The methods of leak detection described in the federal UST rule are tools we can use to find leaks. While most people are familiar with visible leak detection whereby you observe drips from a faucet or a ceiling, leak detection involving flammable liquids escaping from components of a storage system buried beneath the ground is a pretty esoteric topic of discussion at most cocktail parties. For this reason, I'll start by discussing some tools that most people can relate to: saws and hammers.

While saws and hammers can both be used to build a wooden birdhouse, they have very different roles to play in the construction process. Likewise, automatic line-leak detectors and SIR can both be used to detect leaks in pressurized piping, but they have very different roles to play because they operate on very different principles.[3] While it is obvious to most people why you can't drive a nail with a saw, it is perhaps not so obvious why you can't find leaks in satellite piping with inventory control. Let's start by looking at the operating principles behind each of these two methods of leak detection.

Operating Principles of Line-Leak Detectors

Line-leak detectors operate on the following general principles:

- Electronic line-leak detectors (ELLDs) monitor pressure in the piping between two defined points. Usually these points are the check valve in the submersible turbine pump (STP) and the solenoid valve(s) in the dispenser(s). Piping that is NOT between these points in the piping system is not monitored.
- For the piping to be considered tight, the ELLD needs to see that the pressure in the piping between the check valve and the solenoid valve(s) remains reasonably constant during the test period.
- Mechanical line-leak detectors (MLLDs) also use pressure to find leaks in piping but the operating principle is different. MLLDs want to see a rapid rise in the pressure in the piping when the submersible pump is first turned on.
- MLLDs find leaks between the point where the fuel leaves the MLLD and the solenoid valve(s) in the dispenser(s). Piping that is

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not between these two points is not monitored.

- Both ELLDs and MLLDs work by monitoring *pressure* in the piping.
- ELLDs and MLLDs don't give a hoot how many gallons are pumped through the piping each hour or each day or each month. To conduct a test, they must monitor the pressure in the piping during a period when no fuel is moving through the piping.[4]

Operating Principles of Inventory Control

Inventory control operates on the following general principles:

- Inventory is all about arithmetic. Inventory is all about calculating how much fuel went into the storage system, how much came out, and how much is left. Inventory is an accounting procedure.
- Inventory works by comparing the volume of fuel delivered (based on the bill of lading), the volume of fuel dispensed (based on the dispenser meter measurements), and how much is left in the tank (based on ATG or gauge stick measurements).
- Measuring how much fuel goes through the piping each day is a key part of the inventory procedure.
- Inventory finds leaks between the fill pipe and the meter(s) in the dispenser(s). If fuel leaves the storage system for any reason between the fill pipe and the meter(s) it will show up as missing product in the inventory records.
- Inventory doesn't give a hoot about pressure; it works on both suction and pressure piping systems.
- Once the fuel has gone through the dispenser meter and has been accounted for, inventory has no way of knowing what happens to the fuel. If the dispensing hose has a hole and one out of every ten gallons that goes through the

TERMINOLOGY

Automated Inventory: A more recently developed method of leak detection where all of the inventory data are automatically gathered. Delivery volumes, sales volumes, and volume in the tank are all simultaneously recorded at frequent intervals throughout the day without any human intervention. Because no humans are involved in the data gathering, the accuracy of the data is greatly improved and the number of data points that can be gathered is greatly increased. Proprietary statistical techniques are applied to the data to determine if a leak may be present. As for SIR, automated inventory vendors must show that their software can detect leaks of 0.2 gallons per hour with a probability of detection of at least 95 percent and a probability of false alarm of no more than 5 percent to be acceptable as a leak detection method. Because the data gathering techniques for automated inventory are so different from the once-a-day data gathered for SIR, automated inventory control must be evaluated using a different protocol. This protocol is commonly referred to as the Continuous In-Tank Leak Detection (CITLD) protocol.

Check Valve: A valve in a piping system that only allows fluid to flow in one direction. The flow of the fluid opens the valve and the valve closes automatically when fluid flow stops. In both pressurized and suction fuel piping systems, the check valve serves to keep the piping full of fuel when the pump is turned off. In suction pumping systems the check valve is normally located in the dispenser cabinet. In pressurized pumping systems the check valve is located in the pump head at the top of the tank. The check valve in a pressurized pumping system is sometimes referred to as a "functional element" because it serves as a pressure-relief device as well as a check valve.

Line-Leak Detector: In the federal regulations a line-leak detector is defined as a device that will detect a leak in a pressurized piping system of three gallons per hour within a time frame of one hour. The three-gallon per hour leak rate is defined at a pressure of 10 pounds per square inch.

Master/Satellite Dispenser: Most long-distance trucks have two fuel tanks, one on each side of the vehicle. To simplify and speed up the fueling of these trucks, most truck stops provide fueling lanes where there are two nozzles connected to a single meter so tanks on both sides of a truck can be fueled at the same time in a single sales transaction. The dispenser that contains the meter and the credit-card reader is called the master dispenser. The dispenser on the other side of the vehicle has no meter or credit-card reader (it's basically just a stand to hold the nozzle) and is known as the satellite dispenser.

Solenoid Valve: A solenoid valve controls the flow of a fluid using an electromagnet (solenoid) to open and close the valve mechanism. In a fuel dispenser, the solenoid valve controls the flow of fuel to the nozzle. The solenoid valve is normally closed and opens only after a method of paying for the fuel has been established. Solenoid valves are in the closed position when both mechanical and electronic line-leak detectors conduct a test.

Statistical Inventory Reconciliation (SIR): A method of leak detection first developed in the 1980s that takes traditional inventory data and applies statistical techniques to these data to determine whether a leak may be present. The statistical techniques used by each SIR vendor are usually proprietary. To be acceptable as a leak detection method, a SIR vendor must show that their software can detect leaks of 0.2 gallons per hour with a probability of detection of at least 95 percent and a probability of false alarm of no more than 5 percent.

Traditional Inventory: Inventory control that uses simple arithmetic to analyze the inventory data. The sum of the daily variances at the end of the month is compared to the regulatory standard of 1 percent of sales plus 130 gallons to determine whether the inventory data may indicate a problem. This standard will find leaks of about a gallon per hour with a probability of detection of 95 percent and a probability of false alarm of 5 percent.

meter falls on the ground instead of going into a vehicle, the inventory records will still come out perfectly (assuming there are no other holes in the system). Inventory has no way of knowing where the fuel goes after it leaves the meter.

- Inventory is like a bank account. You track how much is deposited, how much is withdrawn, and how much is left. If you withdraw $50 from an ATM (the equivalent of a dispenser meter), the bank subtracts $50 from your account and the reconciliation at the end of the month will accurately reflect the remaining funds in your account. But there is no way for the bank to know whether you spent the $50 on food, or movies, or clothes, or whether the money fell out of your pocket and was lost.

What Happens When These Operating Principles Are Applied to Satellite Piping?

- With regard to the satellite piping that runs between a master dispenser and a satellite dispenser, consider the following: In a master/satellite dispenser setup there is only one meter. The whole purpose of the master/satellite dispenser is so that two nozzles can be used to simultaneously fill the tanks on both sides of a truck in a single sales transaction. In today's electronic world it would be possible to use two meters, one in the master dispenser and one in the satellite dispenser, and automatically add the volume measured by each meter to calculate a total volume dispensed. But satellite dispensers go back to a time when all meter mechanisms were mechanical, and adding the sales volume from two meters and calculating the cost would have involved pencil and paper and a mathematically competent fueling attendant. While technology today is vastly different, the tradition of a single meter in the master dispenser persists.

- In the early master/satellite dispensers, a single solenoid valve

■ *continued on page 10*

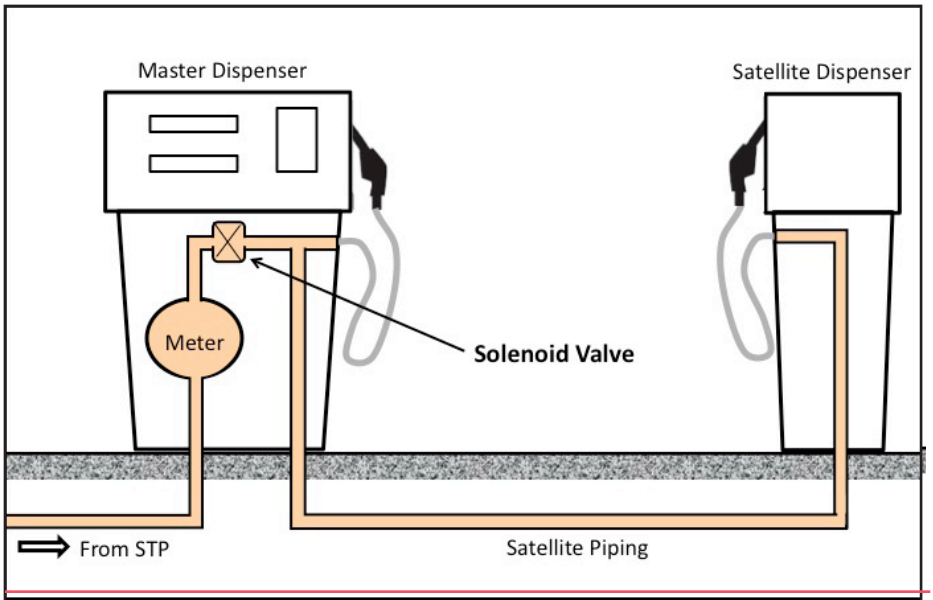

Figure 1. *In the earlier days of master/satellite dispensers, a single solenoid valve was installed upstream of the point where the satellite piping branched off the master dispenser piping. The single solenoid valve controlled the flow of fuel to both the master and satellite nozzles. Line-leak detectors conduct their tests when the solenoid valve is closed, so they cannot "see" leaks beyond the solenoid valve. When the piping was set up in this way the satellite piping was not in compliance with line-leak detection requirements. The satellite piping is also downstream of the master dispenser meter, so inventory-based leak detection methods would not find leaks in the satellite dispenser piping.*

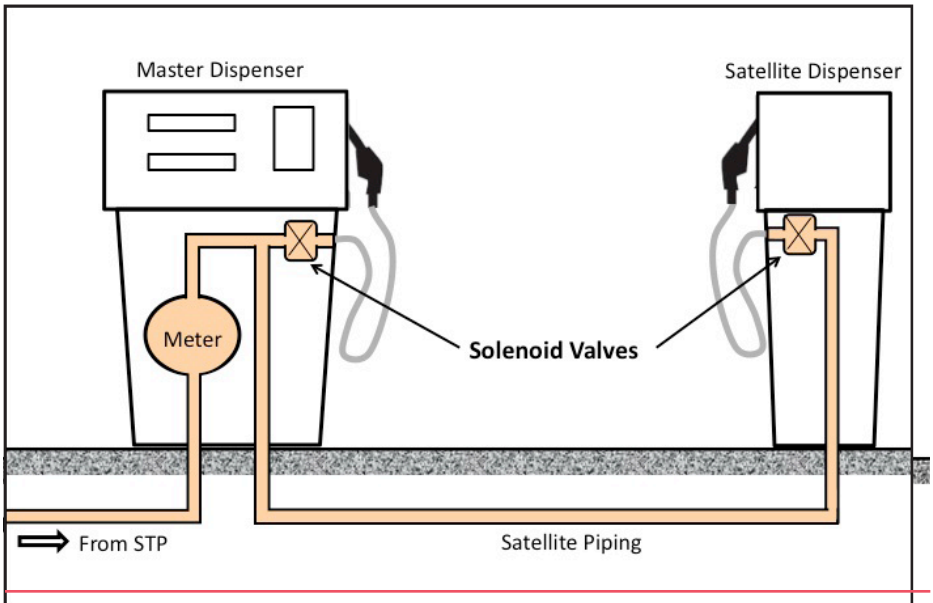

Figure 2. *These days, two solenoid valves are installed in master/satellite dispensers. Because there are no valves in the piping between the line-leak detector and the satellite piping, the leak detector can "see" leaks in the satellite piping and the satellite piping is in compliance with line-leak-detection regulations. But the satellite piping is still downstream of the master dispenser meter, so inventory-based leak detection methods still cannot be used on satellite dispenser piping.*

■ Tank-nically Speaking

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was positioned in the piping before the point where the piping to the satellite dispenser branched off from the master dispenser piping (see Figure 1). Because both MLLDs and ELLDs do their testing when the solenoid valve is closed, this meant that the piping to the satellite dispenser was beyond the solenoid valve and leaks in the satellite piping would not be detected by either a MLLD or ELLD. Fortunately, the technology to solve this problem was quite simple: just use two solenoid valves, one in the master dispenser and one in the satellite dispenser. The solenoid valve in the master dispenser is positioned after the point where the satellite piping branches off from the master dispenser piping (see Figure 2). Because there is no valve between the line-leak detector and the satellite piping, leaks in the satellite piping can be detected by both MLLDs and ELLDs.

➤ While there are two solenoid valves in master/satellite dispensers sold today so that line-leak detection for satellite piping is typically not a problem, master/satellite dispensing systems still have only *one* meter in the master dispenser. Inventory cannot know what happens to fuel after it leaves the meter in the master dispenser. If there is a hole in the piping that leads to the satellite dispenser, the inventory records will still come out perfectly (assuming no other holes in the system) because the fuel has gone through the meter and has been accounted for. This is true for all inventory-based leak detection systems, including traditional inventory reconciliation, SIR, and automated inventory systems certified under the continuous in-tank leak detection (CITLD) protocol.

But Wait, You Protest...

SIR and automated inventory are certified by the manufacturer to find leaks in piping and these methods are accepted by the National Work Group on Leak Detection Evaluations (NWGLDE) as piping leak detection methods! That is correct, these methods can be used for leak detection on pressure and suction piping in general, they just can't be used for satellite piping. Although the certification protocol is silent on whether these methods apply to satellite piping, I'm hoping that the discussion above has made it clear that these methods will not find leaks in satellite piping.

Then how come the rules don't include traditional inventory control as a piping leak detection method? Good question. It is clear that traditional inventory will detect leaks in piping (except satellite piping) if the leak is big enough and the inventory records are kept carefully enough. I couldn't find a direct statement in the preamble of the 1988 federal rule for why traditional inventory is not an acceptable leak detection method for piping. I think it can be inferred from the discussion in the preamble that USEPA did not believe that traditional inventory, which the agency determined could only reliably detect leaks of a gallon an hour, was sufficiently protective of human health and the environment in light of the risk of large leaks posed by pressurized piping.[5]

Amen

So there you have it. Because of their different principles of operation, MLLDs and ELLDs can find leaks in satellite piping if the solenoid valves are set up correctly, but inventory control, no matter where the solenoid valves are located or how automated or sophisticated the inventory analysis, cannot find leaks beyond the dispenser meter. This could change someday if a second meter were installed in the satellite dispenser, but as far as I know, there is no such satellite dispenser in existence today.

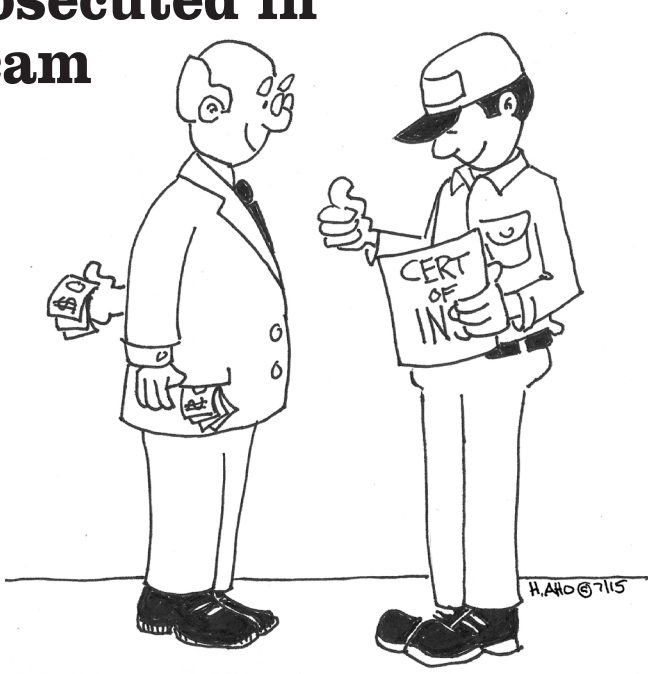
Any other leak detection questions? Send me a note at: marcel.moreau@juno.com ■

Endnotes

1. *Federal Register,* Vol. 53, No. 185, September 23, 1988, p. 37142.
2. See terminologies that accompany this article for the distinctions I make among these three methods of inventory control.
3. For purposes of this discussion, I'm going to set aside the different sizes of leaks that line leak detectors and SIR are able to detect. The point I want to make is that SIR cannot find leaks in satellite piping no matter how big the leak might be.
4. For a more detailed discussion of the workings of line leak detectors, see "Of Blabbermouths and Tattletales: The Life and Times of Automatic Line Leak Detectors," *LUSTLine* Bulletin #29, June 1998, available in the *LUSTLine* archives at *www.neiwpcc.org*.
5. *Federal Register,* Vol. 53, No. 185, September 23, 1988, p. 37157.

Three Insurance Agents Prosecuted in Michigan UST Insurance Scam

by Ellen Frye



Over a two-year period the USEPA and FBI uncovered and disrupted a fraud scheme by insurance agents who fabricated insurance certificates for underground storage tanks (USTs) in Michigan. Once the scheme came to light, on a tip, USEPA and FBI agents initiated an undercover operation in the Lansing, Michigan area. The undercover operation documented that the participants were selling fake insurance certificates for cash to gas station owners who were unwilling to pay the substantial cost for genuine UST insurance.

The investigation determined that, between 2011 and 2013, insurance agents Dean Tucker and Allen Chadderdon sold approximately 175 fake certificates to gas station owners in more than 30 different cities, including Battle Creek, Lansing, Manistique, Ann Arbor, and Detroit, earning them over $80,000.

Chadderdon and Tucker obtained hundreds of dollars (and sometimes substantially more) in cash payments for each fake document sold. That money was pure profit to them—there was no actual policy behind the certificate. A third insurance agent, Jeff Ashton, bought certificates from Tucker and Chadderdon and resold them to his clients. Criminal search warrants were served at the insurance agents' business offices on October 8, 2013.

Federal and state regulations require owners and operators of certain USTs to provide assurance that they can finance a cleanup in the case of a spill or leak. In states without state assurance funds, most owners and operators comply with this requirement by obtaining liability insurance. However, gas station owners with tanks more than 30 years old, or with an "open release status" or an "existing pollution condition" due to a previous or ongoing leak, are typically charged far more for their UST insurance. Insurance companies can also require costly and time-consuming environmental studies prior to issuing a policy.

Tucker and Chadderdon took advantage of this situation by offering clients a fake certificate of insurance to show to regulators. The fake certificates concocted by Chadderdon and Tucker looked identical to genuine insurance certificates and could easily trick an UST inspector to believe that the owner had the necessary insurance in place.

Immediately following the disruption of the criminal scheme, USEPA and Michigan Department of Licensing and Regulatory Affairs (MDLARA) regulators swung into action, inspecting the gas stations that had received the fake certificates. News of the criminal investigation had become known to many of the gas station owners, and some of them quickly obtained valid insurance. Gas stations that were unable to come up with proof of valid insurance were "red-tagged" (i.e., shut down until insurance was obtained).

Financial Coverage Is a Must

The potential for harm to the communities in which these stations operated without valid insurance is obvious. A leaking underground storage tank impacts not only the land immediately surrounding the tank, but can also endanger a community's water supply and contaminate waterways as it travels underground or through storm drains.[1] This is why both federal and state regulations require owners and operators of USTs to prove that they have the financial wherewithal to remediate any pollution and compensate those injured by a release from an UST.

The insurance policies available in the market ensure that owners and operators of USTs have $1 million in available coverage to respond to a leak. According to state cleanup programs, the average cost to clean up a site is $125,000. Also important, if an UST is uninsurable in the market, the owner must update the aging tanks or otherwise bring the facility into compliance. Since the inception of the federal UST regulations, more than 1.8 million USTs have been closed; there were fewer than 7,000 confirmed releases in FY14; and 447,000 cleanups had been completed by the end of FY14.

The Penalties

Tucker and Chadderdon pled guilty to fabricating the insurance certificates in federal court in Grand Rapids, MI. On December 3, 2014, Chadderdon was fined $20,000 and imprisoned for one day and required to perform 200 hours of community service. On March 5, 2015, Tucker received the same sentence. On February 6, 2015, Jeff Ashton was charged in relation to the fraud scheme. On June 08, 2015, he was sentenced to: 30 days of home confinement included in 24 months of probation. The sentence also included a $5,000 fine; 200 hours of community service; attending a substance abuse treatment program; surrender of his insurance license; and a $100 special assessment. In a separate action, in March 2015 the Michigan Department of Insurance and Financial Services revoked both Tucker's and Chadderdon's insurance licenses.

"About half of the nation's population gets its drinking water

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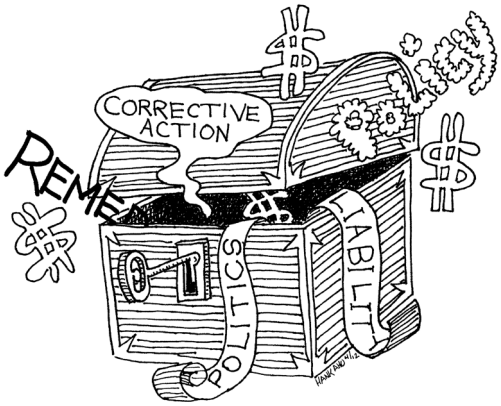
Unlocking the Mystery of FR

A straight-talking column by Jill Williams Hall, Senior Planner with the Delaware Department of Natural Resources and Environmental Control (DNREC). She can be reached at jill.hall@state.de.us.



How Do You Know That an FR Document Is for Real?

The recent insurance scam uncovered in Michigan has caused state inspectors to ask some important questions, such as: How do I know whether the same type of scam is happening in my state? Should I be doing something differently? Unfortunately in today's era of technology there are no easy answers to the dilemma of verification of paper documentation. With a computer and a little ingenuity you can produce virtually anything on paper—diplomas, money, fake insurance certificates. So what can one expect of state UST inspectors when they review financial responsibility documents? Call the insurance company to verify? Can we reasonably expect that states have the staffing levels to call the insurance company on every insurance certificate for every UST site? The simple answer is "no." So what can we do?

- First and foremost, the state must require some reasonable form of documentation—either a copy of the insurance policy or alternately a certificate of insurance—this is *not* simply an Acord form, the insurance industry standardized form. An Acord form does not supply the minimum information required to ensure that appropriate insurance is in place. Minimally the documentation must be at least a certificate of insurance that mirrors the one found in the federal UST regulations. In addition, it is not a bad idea to request a copy of the "Declarations" page of the insurance policy. While both the certificate and the Declarations page can be falsified, the information provided on those documents can then be verified. Requiring the Declarations page in addition to the certificate would require that a nefarious individual would have to put in some extra effort to create both a certificate and Declarations page. Might this act as a deterrent due to the extra effort and knowledge required on the part of the individual doing the falsification? Perhaps.
- Once you have in hand a policy or certificate of insurance, ensure that your inspectors know what they are reviewing. The USEPA document *Financial Responsibility for Underground Storage Tanks: A Reference Manual* (*www.epa.gov/oust/pubs/frustman.htm*) and the Association of State and Territorial Solid Waste Management Officials guidance document *Guide to Tank Insurance* (*www.astswmo.org/Pages/Policies_and_Publications/Tanks.htm*) are excellent resources. Make sure inspectors do a comparison of the language in the submitted certificate of insurance with the required language in your state regulations. If the certificate of insurance deviates from the required language do not accept it as documentation. Require a resubmittal of the certificate that has the exact language required by regulation.
- Do a certain percentage of spot checks every year. Pick a reasonable number that you know your staff can support and have them call the insurance company on the policy or certificate to verify that 1) the insurance company exists, 2) all the information submitted agrees with what the insurance company has on file, and 3) the signature is that of a valid representative of the company. As your inspectors become more seasoned and familiar with correct documentation they'll learn to spot discrepancies. Empower and encourage them to verify any information that doesn't seem "quite right." This becomes a bit of an art, rather than a science, where you learn to rely on your intuition. Follow those instincts—it won't hurt to verify information but it may hurt not to.
- Create a list of insurance companies that you have verified are legitimate companies licensed to sell tank insurance in your state. Currently the number of insurance companies offering tank pollution liability insurance is fairly limited. New companies do come along, so if you spot a name that is not on the list, do the required research and see if you need to add it or if you have uncovered a false company. Partner with your state insurance commissioner's office—they have the insurance expertise you need.
- For the more sophisticated forms of financial responsibility such as bonds, letters of credit, and guarantees you may want to partner with a sister state agency with financial expertise, if such expertise does not exist in your agency. UST staff typically have technical scientific backgrounds, not financial. If something is out of your league be willing to admit it, not ignore it, and reach out to find assistance. Create a partnership with a sister financial agency and ask if they can review financial documents. Remember the only stupid question is the unasked one.
- And always keep in mind that educating our tank owners and operators is the best defense. In the end, if a release occurs and they have no valid financial responsibility mechanism, they are the ones who stand to lose their livelihood. ■

Getting to That High-Hanging Fruit

Building Consensus Through Corrective Action Conferences

by Jeff White

This is the tale of how the Iowa Department of Natural Resources (DNR) developed its system for making difficult decisions for leaking underground storage tank (LUST) sites. I'll discuss how the corrective action (CA) conference process fits in the Iowa Risk-Based Corrective Action (RBCA) program; why the conferences were implemented; how we quantify CA outcomes; how the conferences are managed to facilitate consensus; and finally, I'll provide an assessment of successes and challenges of the CA process.

First, let's go back to 1995 when the Iowa Legislature enacted the initial legislation for UST regulation in the state. The UST Section of the Iowa DNR was established to regulate fuel systems and address releases from those systems. The regulations required that contaminated sites—those that "failed" site checks—undergo assessment and be classified as high risk, low risk, or no action required (NAR).

In 1989, the Iowa Legislature created the Comprehensive Petroleum Underground Storage Tank Fund (the Fund), an independent organization designed to provide reimbursement for the assessment and cleanup of LUST sites. To qualify for the funding program, all UST sites had to undergo site checks (i.e., soil and groundwater sampling) to determine whether the fuel systems had leaked. Those site checks had to be completed by October 26, 1990.

By the 1990s and early 2000s, high-risk LUST sites with single-contaminant plumes, nearby drinking water wells, or vulnerable water lines—the low-hanging fruit—were successfully addressed using tried and true CA approaches (e.g., over-excavation, plugging water wells and providing an alternative water source, or replacing vulnerable water lines).

In 1997, a relatively complex RBCA system was initiated to evaluate risk to human health and the environment from UST releases. The system, still in use today, consists of a three-tiered approach for evaluating risk. Tier 1 is a simple assessment that includes collecting a limited number of samples and comparing contaminant concentrations to a lookup table of standards. The Tier 2 assessment involves defining the extent of contamination and using predictive contaminant transport models to determine risk. The Tier 3 assessment allows a less structured and more creative approach that can be used instead of or after Tier 2 to evaluate or reevaluate risk. For example, a high-risk drinking water well might be cleared in Tier 3 by demonstrating that the water well pumps from a "clean" aquifer that is geologically isolated from the contaminated aquifer.

Our Quagmire

By 2004, CA efforts for nearly 1,200 high-risk sites had bogged down because of difficulties reaching consensus about methods for addressing these more complex challenges. Many high-risk sites stalled at the post Tier 2 stage due to a CA process that was complex, cumbersome, and simply not working well.

Between 1987 and 2004, the process for determining CA technology went like this: The DNR accepted the Tier 2 Report as high-risk and required the responsible party (RP) to hire an environmental consultant to develop a CA plan. The consultant (Iowa Certified Groundwater Professional or CGP) submitted a CA proposal with estimated costs to the RP (usually the property owner) and the Fund. The Fund would accept or reject the proposal; if the Fund accepted it, the CGP prepared and submitted a corrective action design report (CADR) to the DNR and the Fund. If the Fund rejected the proposal, the CGP submitted a new proposal or the Fund put the CADR out to bid. Eventually a CGP completed a CADR, the DNR reviewed the CADR and if DNR accepted it, the CGP was directed to implement the CADR and provide reports to all.

The hitch was that the remediation or CA approach that was acceptable to the Fund might not be acceptable to DNR or vice versa. Thus, the inefficiencies built into the process had the potential for multiple resubmittals of plans and budgets attempting to satisfy the various approval authorities. Further, if a large, complex site needed multiple CA events, the proposal process could take years. And no one person knows all about remediation technologies, success rates, costs, and site conditions. We were deep into backlog country.

Finding a Solution

As a result of the backlog, in July 2004 the DNR sponsored an intensive, week-long business process improvement event to explore options to develop efficiencies in managing a LUST site from start to finish. Representatives from the DNR, CGPs, the Fund, Petroleum Marketers Mutual Insurance Company, and RPs participated in this event. During that event it became apparent that the quagmire in the RBCA process was moving a high-risk site from monitoring into corrective action. The focal point then became how to better support consensus and achieve more corrective action.[1] The group examined the existing system and identified causes for delays.

The general outcome of this complex and somewhat tedious process was a system of structured corrective action conferences and designation of a CA specialist whose main function is to facilitate the conferences (facilitator).

Corrective Action Conferences

At these conferences, the DNR facilitator, the DNR project manager, the RP, the CGP, and representatives of the funding agency (the Fund or other insurance company) meet in person or by conference call to pose

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■ **Corrective Action Conferences**
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questions and discuss the site. At times, other interested parties (e.g., city personnel, adjacent property owners, DNR staff from other sections) also participate. They discuss, for example, current tanks status, findings of prior investigations, or challenging geological and physical site characteristics; explore funding options; and consider possible corrective action approaches or technologies. The initial plan was for each site to have one or two conferences. Half the sites needed only one conference. However, in the past 10 years, 1 percent have involved four or more conferences, and two sites needed nine meetings.

The goal of each conference is to remove barriers to CA and reach consensus on a plan and schedule in order to move the site to closure. Once the details of the plan have been hammered out, all parties sign a memorandum of agreement (MOA). Initially the MOA was a "handshake" agreement, but in 2008 the Iowa Administrative Code was amended so that an MOA becomes a legally binding document between the DNR and the RP. Although CA conferences began in 2004, the full-time facilitator was added to the UST staff in 2005 after the DNR obtained additional funding from the USEPA.

The Facilitator

For the facilitator, preparation and structure are the keys to conference success. Preparation ensures that all participants come to the conference knowing as much as possible about the history, geology, and other factors unique to the site. The facilitator must work closely with the DNR project manager to schedule the conference; require the CGP to provide a detailed worksheet (with recommendations) at least 10 days before the first conference; send out reminders of the upcoming conference; and understand the history and conceptual site model.

Structure ensures that participants feel comfortable participating and know how to contribute to the discussion. The facilitator provides a consistent agenda; promotes inclusiveness and respect from all participants; steers the discussion toward consensus; takes careful notes of the conversation and decisions; and provides detailed notes to the DNR project manager for review and dissemination.

Besides scheduling, facilitating, and providing detailed notes on the conferences, the facilitator serves as a resource for technical review of CADRs, remediation proposals, remediation monitoring reports, and Tier 3 reports. The facilitator also maintains a database to track report submittals, remediation startups and shutdowns, and other significant events.

Track Record

The UST Section conducted its first CA conferences in July 2004, and generally held six to eight meetings a week. In 2004 and 2005, staff held 471 conferences. However, starting in 2006 the number of corrective actions—remediation or Tier 3—undertaken for the higher-hanging fruit increased significantly while the number of conferences gradually decreased to an average of about 60 conferences per year. From inception through the end of 2014, just over 1,200 conferences have been held to discuss CA plans for more than 630 LUST sites.

Why has this approach worked? Communication leads to consensus. We meet, talk, and work together, and get to know and trust each other. Conferences generally are the only occasions for CGPs to meet and get feedback from the Fund, the facilitator, and their DNR project managers. RPs get their concerns addressed and questions answered, receive regulatory and scientific viewpoints, and have a platform to provide their viewpoints and tell their stories. For example, one station owner's business was located in a community near a major recreational lake in Iowa. He expressed concerns that his site not be shut down to conduct an excavation during the summer, the height of his busiest season. We were able to schedule work around his concerns.

With a Little Help from Forensics

One success story involves a LUST site in eastern Iowa that has free product, increasing groundwater BTEX concentrations, and a nearby drinking water well. In a series of four conferences in 2011 to 2012, the conference participants commissioned additional investigation, including product forensics, and determined that the product and contamination were not from a new release. A subsurface, laser-induced fluorescence survey suggested that the LNAPL is primarily held in fractures within the unsaturated clay matrix. Participants agreed to conduct a pilot test and install a soil vapor extraction system, if appropriate. The pilot test showed potential; the system was installed in 2013; and reports indicate the system is working well.

Successes

Over time, the CA conference approach has demonstrated several key strengths. First, the framework has been structured in a way that promotes input from all parties but is flexible enough to support the negotiations and steps toward consensus on CA plans for difficult sites (e.g., highly contaminated sites, commingled plumes, recent releases, complex stratigraphy, or combinations of these factors). The process has allowed us to adapt to changes in regulations, funding constraints, fluctuations in the industry, and developments in technology. Conferences have improved communication and transfers of knowledge and increased trust. But the most crucial outcome is that corrective actions are being implemented, and LUST sites are being closed.

In over ten years, 97 percent of the conferences have been successful. The conferences concluded with a plan that outlined practical, innovative, cost-effective technologies and/or established approaches for alternative assessments under Tier 3; set schedules for work and reporting; specified funding; and guided CA at LUST sites across the state. A review of the site records reveals that conference participants selected the following :

- Tier 3 alternative evaluations such as demonstrating plume stability (40% of the sites)
- Excavating contaminated soil and treating at a soil landfarm/landfill (25%)

■ *continued on page 17*

Wander LUST

....a walkabout with Jeff Kuhn.....

Jeff Kuhn is with the Montana Department of Environmental Quality (MDEQ) and a venerable veteran of petroleum remediation at the state and national levels. Through this column he takes us on "walkabouts" across the fascinating world of underground storage tanks. Jeff welcomes your comments and suggestions and can be reached at jkuhn@mt.gov.

Nuggets of Time

Most towns in Montana come alive in June as winter snow recedes and the weather warms. Suddenly everyone tries to get it all in before the snow flies again in the fall—which can be any time after Labor Day, or for that matter, tomorrow. Folks who live in northern climates are especially sensitive to the passage of the seasons, and of time itself. My friends in New England really felt it this year.

Recently I was reminded of the passage of time when our office moved to a new location, necessitating some high-level sorting of stratigraphic layers of dusty, faded publications, notes, and files. Housecleaning is a good exercise and generally cathartic in nature. But I was immediately struck by the immensity of work associated with so many projects undertaken over the years—work representing the collective efforts of many, many people. Some of these projects had profound implications for the development of the program. Others were well intended, but in retrospect had limited scope or were quickly superseded by more important, rapidly evolving issues.

I'm not suggesting that anyone could have had the foresight to save the time and effort expended on any of these projects. Each was significant and fulfilled a specific purpose. State program needs can change very quickly. When the UST Program was created, the first USEPA Office of Underground Storage Tanks (OUST) Director, Ron Brand, and USEPA coworkers insisted on developing a *new* state program franchise approach that encouraged partnership, innovation, and creativity to address unique state program needs.

In his 2013 book, *True Green*, Brand provides some insight into the origin of this new program:[1] "In a publication we issued, we said: 'Perhaps the best way to begin defining EPA's responsibilities is to say what the Regional Offices will not be doing:

- They won't run the UST program for the state
- They won't dictate behavior at the state level
- They won't second-guess individual state decisions'."[2]

What Ron Brand started has continued with a great deal of momentum behind it. The National Tanks Program has learned a lot in its 30 years. It has been an exceptional model for state-federal partnership, and is distinctly different from other federal grant programs.

This partnership has created an open line of communication that gives OUST the distinct advantage of being able to "think on its feet" and better respond to state needs. On a federal level, OUST has been incredibly open to the input of states. When disagreements occur they are typically quickly resolved through the leadership of state and federal program contacts involved in forums such as the Association of State and Territorial Solid Waste Management Officials' (ASTSWMO) Tanks Subcommittee. State UST/LUST programs have reaped the benefits of that collaboration and the open dialogue created by partnership. We should all applaud OUST for that effort—states really want to see that open dialogue continue.

And Then Came Email... Email...Email

As I sorted through paperwork from years of program management I was more and more amazed at the level of human effort that went into each memo and letter written before the use of internet email. How did we do anything before email? The changes wrought by this simple tool are staggering. Although email creates its own nightmares, I can think of no other tool that has so revolutionized the way our programs interact with partner agencies and all of our stakeholders. We now have the ability to quickly share ideas and gain consensus on issues. In fact, most days it is difficult to keep up with the constant

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■ **Nuggets of Time** *from page 15*

stream of information as online discussions evolve (or devolve).

Entropy, the "lack of order or predictability; gradual decline into disorder"seems to parallel the principle that even the most well-intended email discussions can quickly unravel and go the wrong direction.[3] Those who depend heavily on email usually hit critical mass at some point and resort to a time-proven method of communication—the phone—crude technology, but very effective.

After separating out project-specific, legally sensitive, and milestone documents, I was left with a slowly advancing glacial mass of paper representing years of hard work, staff discussions, countless meetings, workgroup notes, and phone calls. I even found a pile of the small telephone message notes we speared on metal prongs on top of our desks—now gone like my rolodex.

The Nuggets

As I continued to sort and pile paper for recycling I thought about time on a human scale versus the concept of time, which provides a different frame of reference for geologists. After all, I tell my wife, "it took a million years for soil to form in the yard. Can't the bathroom remodeling project wait just a little longer?" But she is a professional musician, and all great symphonic works have a definite beginning and ending. They don't just fade away in geologic time.

With that thought I returned to my office purging of old paper files, thanking Ron Brand for setting in motion an UST/LUST program paradigm that gave birth to each of the nuggets—publications, concepts, enhanced understandings and approaches, new tools and technologies—the prizes of hard-earned work right up to the present that I rediscovered. For example:

• *MUSTs for USTs* • Total Quality Management—TQM • *Revelation* Database • *LUSTLine* articles tracking timely topics • Lab in A Bag • Program Streamlining • *Straight Talk on Tanks, Don't Wait Until '98* • '98 Report Card of the UST Program • State Trust Funds • Risk-Based Corrective Action (RBCA) • USTfields • *Ready for Reuse* • Green Gas Stations • the Petroleum Equipment Institute's (PEI's) development of numerous UST-related Recommended Practices • OUST memo (Sammy Ng) allowing tank removal as part of an investigation at LUST Trust sites • ASTSWMO's MtBE Workgroup • OUST Backlog Report • and from more recent time, my notes from many ASTSWMO Core Report meetings…and the list goes on.

Each of these program initiatives bear testimony to a tremendous partnership involving federal, state, tribal, local, industry, and environmental consulting representatives, all collaborating in a way that has shaped the UST Program as we know it today. How can we know where we're going if we don't value where we've been in the past? It's important for those who come after us to value both our successes and our failures if they are to value the evolution of the program and the close working partnerships we've fostered.

How can we know where we're going if we don't value where we've been in the past? It's important for those who come after us to value both our successes and our failures if they are to value the evolution of the program and the close working partnerships we've fostered.

As I did my sorting, I suddenly sensed with satisfaction the weight of things gone right—cleaning out the cobwebs yet keeping the tremendous web of connections and the collective efforts of so many good people I've worked with—so many nuggets of time.

Back to the Future

It's the weekend now and the June sun has risen to the point of obliterating the screen on my laptop. The magpies are crowing incessantly, and my coffee is cold—time to get started on Saturday morning chores. My son has no concept of spearing phone messages on a metal prong, of hand typing memos on a typewriter, or of walking from cubicle to cubicle to poll staff members about a suitable meeting time. He lives and breathes in cyberspace—the electronic world where ideas are communicated in milliseconds.

But hey, my son now has a phonograph; listening to scratchy old vinyl LPs is apparently very much in these days. It's great when the next generation rediscovers what we already knew worked well and was, well, cool. And despite federal budget cuts I'm hopeful for the future of the tanks program. I don't see environmental cleanup easing up anytime soon. The state-federal partnership that undergirds the UST program is healthy and fully engaged, demonstrating that some ideas are just plain good ideas that stand the test of time.

Bill Torrey, a well-known USEPA Region 1 program manager, captured the sentiment this way:

"The theme of the office was to make states successful. We appreciated how OUST empowered states and offered tools and flexibility so that states could find creative solutions to UST challenges."

Thanks Bill, I couldn't agree more. It's a great feeling to be part of such a partnership and understand the model it represents for other federal programs. Time to look toward the future as the program rolls on! ■

Endnotes

1. Ron Brand, in "True Green: Executive Effectiveness in the U.S. Environmental Protection Agency," Dec. 6, 2013.
2. U.S. EPA. 1989. Commitment to Cooperation: Franchising the UST Program. EPA/530/UST-89/011.
3. Definition of entropy: *http://www.oxforddictionaries.com/us/definition/american_english/entropy.*
4. Bill Torrey quote in "Underground Storage Tanks: Building on the Past to Protect the Future," EPA 510-R-04-001, USEPA Office of Underground Storage Tanks, March 2004.

■ Corrective Action Conferences
from page 14

- Installing or modifying a remediation systems, such as air sparging (25%)
- Modifying or eliminating a receptor, such as plugging a drinking water well (7%)
- Other options (3%)

By the end of 2014, the high-risk backlog had been reduced to fewer than 480 sites. Approximately 4 percent of the conference sites have reached NAR classification, and NAR classifications generally increase each year.

Opportunities

The conferences have become a vehicle for discussion and experimentation with changes in rules, guidance, and procedures. For example, vapor intrusion risk in Tier 2 has been based upon 1995 ideas and sampling procedures. However, during some CA conferences DNR staff, the facilitator, and CGPs have discussed procedures to re-evaluate risk for Tier 2 high-risk receptors in Tier 3 using ITRC/USEPA-recommended vapor intrusion guidelines. Also, new techniques for investigation and remediation of soil and groundwater contamination have been proposed, explained, discussed, and evaluated inside and outside of conferences.

Some challenges remain. For example, how do we get unfunded sites to implement CA? How should we address sites with persistent free product/LNAPL and determine when free product has been removed to the extent practicable? How can we reclassify the hundreds of low-risk (monitor only) sites? Which injection technologies work in which subsurface materials under what conditions?

Despite these challenges, the CA conference process has proven its worth as an effective means of obtaining consensus and remediating LUST sites. ■

Endnote

1. Iowa DNR. 2009. Kaizen Corrective Action Process. *http://www.iowadnr.gov/InsideDNR/RegulatoryLand/UndergroundStorageTanks/LeakingUndergroundTanks/LUSTCorrectiveAction.aspx*.

Jeff White is with the UST Section of the Iowa Department of Natural Resources. He is a certified groundwater professional and well contractor in Iowa and a professional geologist in Kansas and Nebraska. He is transitioning from being the CA Facilitator to becoming the Enforcement Coordinator for the UST Section. He can be reached at jeff.white@dnr.iowa.gov.

■ Insurance Agents Prosecuted
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from groundwater supplies," said Randall K. Ashe, Special Agent in Charge of USEPA's criminal enforcement program in Michigan. "Leaking underground storage tanks pose a significant threat to the quality and safety of that groundwater. To protect human health and the environment, EPA must receive accurate and honest documents. These recent pleas demonstrate that insurance agents who callously place the American people at risk by falsifying official certificates will be held accountable for their actions."

The case was investigated by a law enforcement task force consisting of the United States Postal Inspection Service, the Michigan Department of Natural Resources Environmental Investigations Section, and the Lansing Police Department in addition to USEPA's Criminal Investigation Division and the Federal Bureau of Investigation. ■

Ellen Frye is the editor of LUSTLine. *For more information on this case, contact Richard Porter, USEPA, Criminal Investigation Division Special Agent (734) 692-7659, porter.rich@epa.gov, or Erick Thorson, Michigan Department of Natural Resources, Environmental Investigation Section Detective (586) 753-3720, thorsone@michigan.gov.*

Endnote

1. One example is the release of diesel fuel from a gas station UST in November, 2006 in Luna Pier, Michigan, which resulted in more than $1 million in cleanup costs. The subsequent investigation determined that the station owner had failed to maintain insurance coverage for the UST.

SNAPSHOTS FROM THE FIELD

Here's what can happen when you improperly anchor ballast to a new tank in high groundwater.

Photo by Ryan Harrigan, CT@T

FAQs from the NWGLDE

…All you ever wanted to know about leak detection, but were afraid to ask.

How to Get a New Leak Detection Device Listed on the NWGLDE Website

In this issue's FAQs from the National Work Group on Leak Detection Evaluations (NWGLDE) we discuss the procedure that must be followed before a leak detection device may be listed by the NWGLDE. Please note: the views expressed in this column represent those of the work group and not necessarily those of any implementing agency.

Q. I have a new leak detection device, and I want to get it listed on the NWGLDE website. How do I do that?

A. This is a very basic question, but a detailed answer could take several pages, so we will provide the following *Reader's Digest* version. The NWGLDE website contains more details in Listing Procedures and Requirements at *www.nwglde.org/downloads/listing_requirements_pdf.pdf* and in the NWGLDE Policy Memo #3 at *www.nwglde.org/Policy3_PDF.pdf*.

- **Contact an independent, or "third-party," evaluator to discuss having an evaluation of your leak detection method.**

"Third-party evaluators" include consulting firms, test laboratories, not-for-profit research organizations, and educational institutions that have no conflict of interest with you or your company. The evaluator can tell you about specific evaluation requirements for your method, whether special testing equipment or facilities will be needed, how long the evaluation process may take, and of course, how they price their services. Evaluators that have performed UST leak detection evaluations can be found in the lower right corner of all NWGLDE leak detection equipment listings at *www.nwglde.org*. After you have engaged an evaluator, you will receive a report summarizing results of the testing process according to specific report guidelines. Additional supporting documentation may be submitted with the evaluation.

- **Perform the evaluation according to an approved protocol.**

The NWGLDE has reviewed and approved numerous protocols for testing various leak detection methods and equipment. NWGLDE-approved protocols are located at *www.nwglde.org/protocols.html* on our website. One of them should be applicable to your method; however, in years past it was not uncommon for a new technology to appear before there was an approved protocol for evaluating it. This produced a "cart before the horse" situation for the NWGLDE whose mission is to review third-party evaluations according to an approved protocol. In those cases, the evaluator would need to draft an applicable evaluation protocol that was reviewed and approved by the NWGLDE before a review of the equipment evaluation could be undertaken.

For some equipment, it might be necessary to modify or amend an existing protocol to make it applicable to the method or equipment being tested. If that is the case, then the evaluator must make sure the NWGLDE is aware of those protocol modifications and in agreement with them *before* the evaluation is done. It would be counterproductive to have to redo an evaluation simply because protocol amendments were not acceptable to the NWGLDE, or never shared with us in advance of the evaluation.

- **Once the evaluation is completed, submit it to the NWGLDE for review.**

Submittal of a final evaluation is the last step in the NWGLDE listing process and it can be complicated. It is very important for vendors to understand that serving on the NWGLDE is not a full-time job for any member. Members work for individual states, counties, or USEPA, and their first work obligation is to their employer. Their NWGLDE responsibilities normally take a back seat to the demands of their employer. All members have agreed to make time available to accomplish NWGLDE activities, but there are times when member work demands may cause a review to take longer than usual.

Work Group Policy Memo #3, which is referenced above, states: *For planning purposes, anticipate at least a six-month review process for a complete evaluation package*. If the evaluation submittal package is complete, it would rarely require six months for a review. However, if there are unanswered questions, additional documentation to be provided, or additional testing needed, the review process could take six months or longer. In order to ensure that the process will be able to move forward, it is very important to communicate with the NWGLDE throughout the review process.

That being said, the review process itself is as follows:

1. The evaluation package is distributed to members of a specific review team according to leak detection technology. The teams typically consist of two to four persons and are subcommittees of the

FAQs… continued from page 18

entire group. A list of teams and team members is posted on the NWGLDE website.

2. Although all team members receive the package, a lead reviewer often does the initial review.
3. Any concerns or problems identified are discussed with the rest of the team and then with the vendor.
4. If the vendor resolves the concerns, then the review proceeds.
5. If the vendor is nonresponsive, the team may suspend the review process.
6. If the vendor disputes any concern(s) of the team, there is an opportunity to bring the concern(s) before the entire NWGLDE for further discussion and resolution.
7. Once the team has finished its review and all concerns are satisfied, a draft leak detection method listing is developed. The team then sends the vendor a proposal of how the listing will appear on the NWGLDE List.
8. If the vendor has concerns, the team will work with the vendor to resolve them.
9. If the vendor is satisfied with the listing, the team leader sends it to the NWGLDE chair, who circulates it to the entire NWGLDE with a set period to concur or express any concerns with the draft.
10. After the members are satisfied with the draft listing, the chair sends it to the NWGLDE webmaster who updates the website listing.

More specific details of the review procedure can be found in Work Group Policy Memo #3, available on the NWGLDE website. ■

About the NWGLDE

The NWGLDE is an independent work group comprising eleven members, including ten state and one USEPA member. This column provides answers to frequently asked questions (FAQs) the NWGLDE receives from regulators and people in the industry on leak detection. If you have questions for the group, contact them at questions@nwglde.org.

NWGLDE's Mission

- Review leak detection system evaluations to determine if each evaluation was performed in accordance with an acceptable leak detection test method protocol and ensure that the leak detection system meets EPA and/or other applicable regulatory performance standards.
- Review only draft and final leak detection test method protocols submitted to the work group by a peer review committee to ensure they meet equivalency standards stated in the U.S. EPA standard test procedures.
- Make the results of such reviews available to interested parties.

New from ASTSWMO

Compilation of State UST Fund Fraud & Abuse Cases

The Association of State and Territorial Solid Waste Management Officials' ASTSWMO Tanks Subcommittee's State Fund–Financial Responsibility Task Force has developed a new *Compilation of State UST Fund Fraud & Abuse Cases.* The document chronicles instances of state underground storage tank (UST) fund fraud and abuse nationwide. The Task Force, through its regional members, contacted every state to solicit entries for the document spreadsheet. States were asked to be as specific as possible, but were cautioned not to divulge anything that was confidential or they did not want to be made public.

The spreadsheet provides summaries of cases that have been submitted to ASTSWMO by state UST managers, including a description of the fraud cases, how they were detected, and case outcomes. The intent of the spreadsheet is to assist states in detecting any similar cases in their own state. The Task Force will update the spreadsheet on a regular basis. If you have examples you would like to add to the next version you may send them to Charles Reyes at charlesr@astswmo.org. The document is available on the ASTSWMO website: *www.astswmo.org.* ■

L.U.S.T.LINE
New England Interstate Water
Pollution Control Commission
Wannalancit Mills
650 Suffolk Street, Suite 410
Lowell, MA 01854

Non-Profit Org.
U.S. Postage
PAID
Wilmington, MA
Permit No.
200

National Tanks Conference & Expo

Hope to See You in Phoenix!

Registration for the 25th National Tanks Conference and Expo in Phoenix, Arizona is open. The 2015 agenda features sessions covering a wide range of underground storage tank topics, including biofuels, remediation technologies, crucial financial responsibility issues, and the new regulations. In addition to the educational sessions, ample opportunities for informal networking will be provided, allowing you to share knowledge and experiences with fellow attendees.

The Expo will feature informative booths from state, tribal, and federal agencies, as well as displays from vendors showcasing the latest tanks-related products and services. As a host city, Phoenix offers several outstanding social opportunities, which we know will enhance your conference experience.

The conference website will be updated regularly with the latest information, so please visit often. Additionally, if you wish to be included on the National Tanks Conference email list to receive periodic updates and reminders about the conference, please send your email address to NTCInfo@neiwpcc.org. ■