New England Interstate
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Commission

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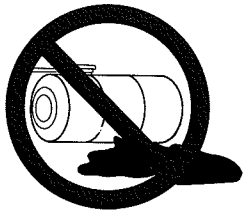
L.U.S.T. LINE



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

THE SEARCH FOR THE HONEST TANK

UST Regulators Beef Up Facility Compliance Enforcement Efforts

It is said that the Ancient Greek Philosopher Diogenes walked through Athens in broad daylight carrying a lighted lamp searching for an honest man.

Today, at the close of the 20th Century, the search for honesty and integrity has expanded into the realm of underground petroleum and hazardous substance storage systems.

BELIEVE IT OR NOT, NOT ALL TANK OWNERS AND OPERATORS HAVE eagerly read their UST regs. Those who have, may not necessarily grasp the nuts and bolts of the regulatory message. Those who understand the message, may not always choose to act...in good time. Some just ignore the regulations. Some adopt a "wait and see" position, with the thought in mind that perhaps no one will notice. On the other hand, if some regulator-type person were to appear on the scene, well then, okay, we'll do something about it.

Of course, there is a fair amount of regulatory awareness out there. The majors, for example, have by and large cast their lots with regulatory rightfulness, having recognized that, in the long run, it is good business. In fact, anyone who has experienced the cost of cleaning up a leak will generally have a clearer picture of the regulatory *raison d'etre.*

Indeed, many tank owners and operators are working at getting their UST systems up to speed, but often these initiatives do not result simply because a copy of UST regs was received in the mail. Often, the business of getting the regulated community into compliance requires further explanation.

Many UST-related trade associations have been helpful in getting the word out. Various courses, conferences, and workshops have been offered by states, universities, and other private groups. But, the real burden of getting the message straight rests largely with the various state and local UST regulatory agencies around the country. Their job is tackled partly through outreach activities such as speeches, presentations, public service announcements, handout materials, and mass mailings that address important compliance deadlines (see *Compliance Letters* on page 8).

But a lot of the explaining is done on a one to one basis. Many regulators spend a good deal of time on the phone

■ *continued on page 2*

Inside

▪ Honest Tank, *continued*

answering questions from owners and operators. *How do I fill out this form? What do I need to do? When do I need to get my tank tested? Do you have information on leak detection systems? Could you explain the financial responsibility requirements?*

"Most of our calls are anonymous" says Lynn Olson-Theodoro, who spends a lot of time answering UST questions at the Connecticut Department of Environmental Protection. "People will call with specific questions that are usually easy to answer, although sometimes I have to read between the lines to figure out what information they really need. Some people ask one question and leave out the questions they should have asked.

"I often spend five minutes to half an hour talking people through how to fill out their registration forms," says Olson-Theodoro. "Some people are not used to being regulated and are nervous because they are dealing with a regulatory agency. I try to calm them down and reassure them, and then I try to explain things.

"The registration forms may require field verification. You can't really be sure you are getting accurate information. Some people obviously haven't set eyes on the regulations and they fill out a form that honestly and blatantly tells us that the facility is not in compliance. Others figure it is a lot easier to lie than comply. Often when we look over the forms we can see that two and two don't add up to four - like cathodically protected fiberglass tanks. We get information that make us suspicious."

LUSTLine

Editor, *Ellen Frye*

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Kate Becker, EPA Project Officer
Jennie Bridge, NEIWPCC Project Officer
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The New England Interstate Water Pollution Control Commission was established by an Act of Congress in 1947 and remains the oldest agency in the Northeast United States concerned with coordination of the multimedia environmental activities of the States of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island and Vermont.

NEIWPCC
85 Merrimac Street, Boston, MA 02114
Telephone: (617)367-8522

Layout, *Ricki Pappo*

> ***"The education part can't be stressed enough; it's a leak prevention measure. We explain to owners and operators how they can take steps to prevent problems rather than having to clean them up. This way we also avoid having owners and operators repeat the same mistakes and violations."***
>
> ***Cris Caporale, DADE County D.E.R.M.***

"We recently mailed out leak detection compliance letters to tank owners and operators and found ourselves swamped with calls," says Kathleen Calloway, UST Program Manager with Delaware's Department of Natural Resources and Environmental Control. "We've had a number of people ask us 'what *is* release detection?' People don't understand the technical standards and the technical terms. With the letter campaigns we're not always sure we've gotten at the truth."

Because registration forms, letter campaigns and phone conversations don't necessarily ensure that all's well on the compliance front, more and more state and local regulatory authorities are trying to explain and enforce UST rules by getting out and doing UST facility compliance inspections. Of course, many state agencies, juggling limited staff and other program priorities, must prioritize, targeting for inspection the facilities they feel need attention sooner than later - the complaints of odors, environmentally sensitive sites, older tanks, incomplete registrations.

Once at the facilities, inspectors can see what's what for themselves. They can verify registration information, check required facility records, look for compliance with technical standards, keep an eye open for the unusual and mysterious, and document these observations. What is more, they use this opportunity to educate and promote goodwill and voluntary compliance by talking face to face with owners and operators.

What You Don't Know Might Hurt You

The facility compliance inspection is first and foremost an enforcement effort; a means of ascertaining, first hand, some truth that registration forms may not adequately convey. Inspectors have found that these site visits are an important way to educate the owner or operator; to shed light on what it takes to achieve UST system honesty and integrity according to applicable rules.

"We have found that the facility inspection is a job that needs to be done," says Chris Caporale of Dade County Florida's Department of Environmental Resource Management. "With the amount of leaks and spills we have seen in the past - and still see going on - we want our inspectors out there to catch these potential problems before they become worse."

"The laws are complex," explains Phil Wilde, an inspector with the Connecticut Department of Environmental Protection. "Often owners and operators are not aware of the requirements. An inspector can go into the field and educate as well as regulate."

"It's not unusual for a tank owner or operator to tell us he was just waiting for us to come and tell him what to do," says Kathleen Calloway. "On first inspections we see a range of about 10 to 20 percent compliance. But, after an inspector has gone over the violations and explained things to the owners or operators, about 50 percent of the facilities take steps to come into compliance voluntarily."

"The education part can't be stressed enough," says Caporale. "It's a leak prevention measure. We explain to owners and operators how they can take steps to prevent problems rather than having to clean them up. This way we also avoid having owners and operators repeat the same mistakes and violations."

Inspectors say that most violations are relatively easy and inexpensive to correct. For example, both Maryland and Delaware have fill port code requirements. The fill covers must be painted specific color codes and symbols that are designed to avoid fuel delivery error. A fuel delivery into a groundwater monitoring well can be disastrous. (Yes, it does happen!) Yet both States report that fill marking is one of the most common violations.

A number one violation noted by UST inspectors far and wide is failure to keep proper inventory records.

Inventory control in combination with tightness testing is currently the most commonly used or misused form of leak detection. "Some owners and operators don't keep inventory records at all. Many do it badly," says Calloway. "Some operators tell us they write their data on the calendar." Yet it doesn't cost anything to keep proper inventory records and good practice can provide an important environmental and business benefit.

Protocol and Body Language

Depending on regulatory policy, facility inspections may be announced or unannounced. Even if the visit is announced, the owner or operator is not going to be able to do too much to prepare for the occasion, except to make sure that all appropriate records are available to the inspector. Alas, sometimes in the absence of up-to-date records, an owner has been known to falsify records – occasionally an inspector will be handed a set of inventory records with the curious appearance of having been too neatly written in one pen in one hand on one day.

For each facility visit the inspector must be prepared for a new collection of players, moods, technical apparatus, recordkeeping techniques, and curiosities. Many tank owners and operators are interested in what inspectors have to say. Others proudly show off their new state-of-the-art investment. Occasionally, an owner is decidedly uncooperative, if not hostile. Often, inspectors arrive at facilities where no one knows anything about the operation. The inspector has to make a yeoman's effort to find an owner, or some responsible person, or anyone who even gives a hoot.

Although the inspection can present logistical and psychodramatic challenges, the inspector must remain even-keeled. "I think the inspector's attitude and personality play a big part not only in compliance but also in keeping an open relationship with the tank owner," says Captain Greg Bestudik with the Springfield, Illinois Department of Fire Safety. "I've seen inspectors get real hard-nosed with the people at a facility, and they got nowhere. They hit a brick wall. Our job is to go in there and say, 'Look, we're here to help you. Let's get your system in shape before you have a problem. If you work with us, we'll work with you.'"

■ *continued on page 16*

Hey Ron Brand We'll Miss You!

OUST Director Retires from EPA Leaving Behind a Model Federal Program

The guy was always talking about paradigm shifts, about doing things better, about total quality management, about continuous improvement. The really odd part of it is, he was talking like this as director of a Federal regulatory agency...ain't that a kick in the head? If you hadn't met the guy, you'd be inclined to quip, "Dream on little dreamer. Like, get back to federal reality man!" But you didn't, because you sort of figured if anyone could get the titanic and complex federal underground storage tank program off the ground, Ron Brand could...and he did.

Ron Brand has announced his retirement from EPA. He is no longer with the Office of Underground Storage Tanks (OUST). He is finishing up his EPA tour of duty on special assignment in the Administrator's Office to work full time (you guessed it) on implementing Total Quality Management (TQM) at EPA.

TQM is a management process that has been employed mostly in private industry, particularly Japanese industry. In a nutshell, the process is one of recognizing where you are, where you want to be, then working toward that end to achieve continuous improvement in quality, productivity, and efficiency - not exactly a bureaucratic modus operandi. But, Ron recognized that a program with a regulated universe as vast as that of the nation's underground storage tanks could only work if the traditional regulatory paradigms were abandoned in favor of a more effective management process.

Ron worked effectively with OUST headquarters and EPA Regional staff, state and local agency personnel, and the private sector to design and implement a model federal program. His innovations in OUST include a "franchise" approach whereby the federal program enables state and local agencies to assume a central role in running their individual programs. He pioneered the application of TQM principles to environmental programs. Most important, under Ron's leadership, the UST program has made remarkable progress in addressing the environmental problems associated with leaking underground storage tanks and getting information out where it needs to be.

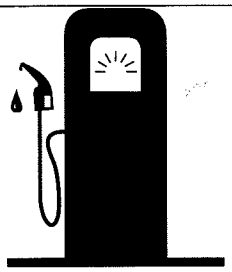
LUSTLine bids Ron a fond farewell and many many tanks for his support and his contributions to effective federal and state partnerships and, above all, environmental protection.

Hello, David Ziegele!

We would like to welcome David Ziegele to the tank family. David was formerly director of EPA's Program Evaluation Division and will now serve as Acting Director of OUST until a permanent director is chosen. Now fully engaged in his new role, Ziegele says he thinks that EPA and state and local agencies can be proud of the rapid progress that the national UST program has made in the last several years. However, he points out that many significant challenges remain.

"I intend to maintain OUST's focus on the three priority areas we've identified for this year - leak detection enforcement, state program development and approval, and streamlining cleanups," says Ziegele. "I would also like to direct more effort toward reducing unnecessary program cost impacts on the regulated community, on implementing agencies, and on the economy as a whole. Overall, EPA's goal will continue to be aimed at helping state and local agencies improve their programs and protecting public health and the environment in the most sensible and cost-effective way possible."■

Inventory Control... The Untold Story



by Marcel Moreau

Now is the time for all good tank owners to get serious about leak detection!

- **DONG..**two leak detection deadlines have passed.
- **DONG..**the pressurized piping leak detection deadline has passed.
- **DONG..**only three more deadlines to go before all storage systems in use must have some form of leak detection.

Ask not for whom the deadline tolls, the deadline could be tolling for thee. But alas, in these uncertain financial times and what with the bewildering array of expensive leak detection hardware, many a tank owner has harkened and heeded the bell by simply resorting to that familiar, inexpensive old standby, inventory control.

In terms of accuracy in detecting leaks or convenience to the operator, inventory control is certainly not the best of leak detection methods, but it is clearly the cheapest. The capital investment - a brand new gauge stick - costs about $7.95. When used in conjunction with tightness testing, inventory control does meet the federal (but maybe not your state or local) leak detection requirements.

Simple in Concept, *But...*

Inventory control technique is simple in concept, but it can become quite complex in the execution. Also, interpretation of the results requires a fairly sophisticated understanding of the sources of error in the method. The procedure involves taking careful measurements and recording, on a daily basis, the amount of liquid in a tank, the amount that has been dispensed, and the amount that may have been delivered. In theory, there should be a balance such that the amount in the tank yesterday, plus the amount delivered today, minus the amount dispensed today, equals the volume in the tank today.

Because of inaccuracies in measuring the volume of liquid in the tank and the volume of liquid dispensed, this calculation will never be exact. But, if it is conscientiously carried out, it will indicate significant problems in the system.

While many owners and operators claim to be doing inventory control, it has been my experience that very few practitioners keep the kind of inventory records that meet the standards set in the federal regulations.

What are those standards? Let's take a quick guided tour through the regulatory criteria with some commentary on why inventory control is rather an imprecise leak detection method.

Keep in mind, the role given to inventory control in combination with tightness testing in the federal regulations is twofold:

- It is a low cost interim measure which can be used during the phase-in of the leak detection requirements.
- It is allowed for the first 10 years of a new or upgraded tank's life on the presumption that the likelihood of a new or upgraded tank's leaking is very small.

Frequency of Inventory Measurements

The amount of product in the tank, the volume dispensed, and the amount of any deliveries must be measured every day that the system is in operation. This means that neither rain, sleet, snow, or dark of night should keep the trusty "stickman" from his appointed rounds. But, the wet/dry line on a gauge stick is hard enough to read in daylight and sunshine, let alone in the dark and rain. Adverse weather conditions clearly affect the accuracy of gauge stick readings.

Accuracy of Inventory Measurements

The measurements of level in the tank must be made to the nearest 1/8 inch. Wooden gauge sticks are available with 1/8-inch markings on them, but because of the tendency of lighter petroleum products such as gasoline to "creep" up the stick and to evaporate, it is difficult to read a wooden stick accurately to within 1/8 inch.

Happily, there is a paste available which can be smeared on the stick prior to inserting it in the tank. The paste changes color when it contacts petroleum products, thus indicating clearly the exact liquid level in the tank. Although this improves the accuracy of gauge stick readings considerably, the technique does not appear to have caught on in practice.

A further obstacle to determining the liquid volume accurately is that tank gauging tables typically do not provide direct conversions from inches to gallons in 1/8-inch increments. (This is true even for tanks being sold today, two years after the federal regulations went into effect!) The person keeping the records must interpolate (or more often, "guesstimate") the number of gallons from the information at hand. Depending on this person's facility with mathematics, he/she can introduce another significant source of error into the inventory recordkeeping procedure.

Here's a sample problem: What is the volume of gasoline in a 10,000-gallon tank that contains 47 3/8 inches of liquid? The tank chart gives the volume at 47 inches as 4,896 gallons and the volume at 48 inches as 5,029 gallons. (Answer at the end of the article.)

Another source of error in measuring the volume of liquid in the tank is that while tank gauging tables assume that the tank is level, most tanks are installed on a small tilt. This tilt could result from failure to level the tank bedding properly. It could also be intentional so that any water that enters the tank would accumulate at the end of the tank where the fill pipe is located, thereby making the water easier to detect and remove.

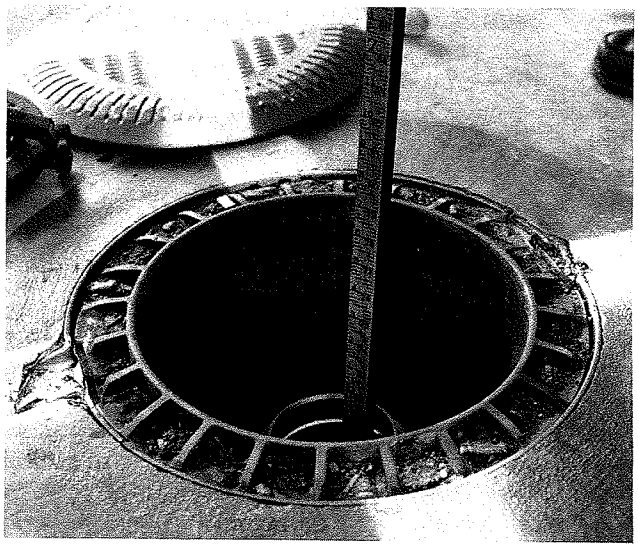
While this tilt is very useful in the early detection of water, it introduces another source of error into the inventory measurements. For example, let's take a 10,000-gallon tank which is 8' in diameter and 26' 9" long. The tank has been carefully installed so that it slopes exactly 1/8 inch per foot toward the fill end of the tank. The fill pipe is located 1 foot from the low end of the tank. You measure 48 3/8 inches of liquid in the tank. Your tank chart, if it is broken down into 1/8-inch increments, will tell you that you have 5,079 gallons of liquid in the tank.

If the tank were perfectly level, however, you would have measured a depth of 46 7/8 inches and converted this into a volume of 4,879 gallons, a difference of 200 gallons between the inventory measurement and the true volume of liquid in the tank. The difference would have been 400 gallons if the tank had been tilted 1/4 inch per foot.

To further confuse the issue, because the tank is a cylinder and does not have vertical sides, the difference between the measured and actual volume of the tank varies with the depth. For example, the tank above with the 1/8 inch tilt would show a 128-gallon difference between the measured and actual volume at the 12-inch level and a 152-gallon difference at the 80 inch level.

Check Tank Bottoms for Water

Keeping track of water is important from a product quality as well as a leak detection point of view. It is important for steel tanks because water in the tank will encourage internal corrosion of the bottom of the tank. Cathodic protection on the outside of a steel tank does not prevent internal corrosion.



The Gauge stick should have 1/8-inch increments

Water content of the tanks should be measured within 1/8 inch on a monthly basis, in addition to product readings. In areas of high water table, incursion of water into the tank is often an indication of the presence of a leak, and is more likely to occur when the liquid level in the tank is low.

Water may also appear in a tank from infiltration through a tank top fitting. Infiltration could result from a broken or loose vent or fill line, a loose cap on the fill pipe, or failure to put secure plugs on the unused tank top fittings.

Physical Measurement of Product Deliveries

A physical reading of the product level before and after a delivery must be performed. In other words, the delivery receipt is not to be taken as the actual amount of the delivery. Rather, the volume should be calculated by using before and after delivery stick readings and the tank gauge chart. In my experience, this is the most common deviation from the inventory control procedures specified by the federal rule.

Errors in recording deliveries are also the most common source of error in many inventory records, according to companies in the business of statistically analyzing inventory control records. Using delivery receipt volumes in the inventory control procedure, instead of the volume measured using a gauge stick, often introduces discrepancies into the records which can bewilder the inventory recordkeeper.

Part of the delivery error is, again, because most tanks are not perfectly horizontal as the tank chart assumes. Let's go back to our example of the 10,000-gallon tank with the 1/8 inch per foot tilt and the fill pipe at the lower end.

The table below shows the delivery error that could result from a 4,000 and 8,000-gallon delivery, when the initial measured liquid level in the tank is 12 inches. The 4,000-gallon delivery would appear to be a 4,070-gallon delivery, and the 8,000-gallon delivery would appear to be an 8,027-gallon delivery. This error is not a constant; it depends on the volume delivered and the initial volume of the liquid in the tank.

Temperature differences between the product delivered and the product

■ *continued on page 6*

	ACTUAL	MEASURED	ERROR
Beginning	10.5"= 597 gal.	12"= 726 gal.	129 gal.
Delivery 4,000 gal.	44 3/4"= 4,597 gal.	46 1/4"= 4,796 gal.	70 gal.
Delivery 8,000 gal.	76 1/2"= 8,597 gal.	78"= 8,753 gal.	27 gal.

■ Inventory Control, *continued*

from page 5

in the tank are another source of error. Product stored in an above-ground bulk plant will often have a dramatically different temperature than that stored in a UST. The product stored above ground is likely to be warmer than the underground product in the summer and colder in the winter, especially in the northern states.

A 4,000-gallon delivery that cools 20°F (from 70° to 50°F) when it adjusts to ground temperature in the summer will show a shrinkage of 54 gallons. In the winter, when the delivered product may be 20°F cooler than the ground temperature (product temperature of 20°F vs ground temperature of 40°F), the result could be a 54-gallon gain in product. The volume change does not occur immediately upon delivery; it occurs over the day or so after delivery as the liquid temperature comes into equilibrium with ground temperature.

Deliveries Must Be Made Through A Drop Tube

Deliveries must be made through a drop tube that extends to within one foot of the tank bottom. This requirement ensures that the gauge stick is held vertically and that a more accurate reading is taken. Drop tubes are fairly standard items on newer tank installations, but many older tanks do not have them. Usually they can be retrofitted if the fill pipe is 3 or 4 inches in diameter.

Calibration of Dispensing Meters

The meter through which product is dispensed must be calibrated to an accuracy of at least 6 cubic inches for every 5 gallons of product. Five gallons is equivalent to 1,155 cubic inches, so this is an accuracy of .5 percent. Usually, calibration is routinely performed on dispensers used in retail operations by weights and measures people. Non-retail dispensers are calibrated infrequently, if ever.

Dispensers should be calibrated yearly to ensure the accuracy of the inventory records. The procedure is simple. It involves dispensing 5 gallons of product into a specially calibrated can and comparing the actual volume dispensed, as indicated by the can, with the volume indicated by the pump meter display. The metering apparatus is then adjusted to bring the volume dispensed to within the tolerance level.

While many owners and operators claim to be doing inventory control, it has been my experience that very few practitioners keep the kind of inventory records that meet the standards set in the federal regulations.

Meters that are even slightly off in calibration can produce significant inventory errors. A meter which is off by 5 cubic inches per 5 gallons, while still within specifications, will introduce a .4% error into the records. This would amount to a 400-gallon error for each 100,000-gallons pumped. Whether the error is a gain or a loss will depend on whether the meter is pumping more or less liquid than it should.

What to Do With the Data

The data must be reconciled on a monthly basis, which means the cumulative error of all the daily readings over the period of a month is compared with the total amount of liquid dispensed during the month. The acceptable margin of error is 1% of the amount dispensed plus 130 gallons. The old American Petroleum Institute standard of 0.5% of the amount dispensed (5 gallons for every 1,000-gallons pumped) was found to result in too many indications of a leak when none, in fact, was present, especially when the amount of fuel dispensed in a month was small. The current EPA standard is thought to be able to reliably detect leaks of 1 gallon per hour (720 gallons per month) with a false alarm rate of about 5%, according to studies commissioned by EPA.

Remember, because the leak detection capabilities of inventory control by itself are limited, this method must be used in conjunction with periodic tightness testing. Tanks that are not corrosion-protected must undergo a tightness test every year. Corrosion-protected tanks and piping that also incorporate spill and overfill protection must be tested every 5 years (state and local regs may be more strict).

The Future of Inventory Control

In the long term, inventory control used in conjunction with tightness testing will not be sufficient as a leak detection option. The federal regs are designed to wean the country away from inventory control as a leak detection technique. This option is allowed initially because it is inexpensive and easily implemented. It, theoretically, gives tank owners no excuse not to initiate some minimal form of leak detection according to the timetable set out in the regulations. But, this combination of inventory control and tightness testing will only be a valid form of leak detection until:

- December 1998 for non-corrosion protected systems, or
- ten years after a new system is installed or an existing system is upgraded with corrosion protection, spill and overfill protection, whichever is later.

Found Difficult and Left Untried?

Inventory control may be inexpensive and legal, but it is a good deal more complex and fraught with more inaccuracies than most owners/operators/regulators would care to know, even when it is done according to the regulations (which it mostly isn't). I personally do not get the warm fuzzy feelings that many tank owners seem to get when they say with complete confidence, "my inventory records are perfect."

Then again, perhaps I am just an old cynic. Perhaps inventory control, as G.K. Chesterton once wrote of Christianity, "has not been tried and found wanting, it has been found difficult and left untried." ■

Marcel Moreau is a nationally recognized petroleum storage specialist. Your comments and opinions on this subject are welcome.

(Answer to the question: 4,946 gallons.)

USE THAT GAUGE STICK RIGHT!

by Charles Erdman, Jr. and Bob Holland

GAUGE (OR "DIP") STICKS HAVE BEEN used to measure the contents of USTs for many years. Gauge sticks are used as part of inventory control which, in conjunction with periodic tightness tests, is one of the methods that owner/operators can use to comply with the leak detection provisions of the federal UST rules - at least until 1998. The dip stick can be a reasonably accurate device for measuring the contents of a tank, provided it is used in a correct and careful manner.

Formerly, dip sticks were implicated in both the abrasion and removal of the protective oxide layer at the bottom of steel USTs (a source of some internal corrosion problems) and the puncturing of fiberglass reinforced plastic (FRP) tanks. However, the manufacturers of virtually all USTs have added "splash" or "striker" plates under the openings of these tanks, substantially reducing the possibility of damage to the structure of the tank.

It is important to be aware of the possible sources of inaccuracy associated with using gauge sticks (see *Inventory Control...The Untold Story* - page 4). For example, gauge charts provided by tank manufacturers (which should provide conversions from inches to gallons in 1/8-inch increments) give theoretical capacities. Actual capacities can vary due to allowable fabrication tolerances in tank sizes. Also, the recommended practice of sloping the tank at installation will cause slight errors.

Even with proper procedure, you must recognize that there are unavoidable errors in measurement. The operator should recognize that measurement error is generally less than 5% between the stick reading and the actual contents of the tank. But remember, EPA's allowable error is 1%.

A few suggestions can help the operator protect his tanks and obtain more accurate stick readings:

1) Use proper equipment. Dip sticks should have 1/8-inch increments. Federal rules for inventory control release detection require measurement of product to the nearest 1/8 inch. Also, it is best to use sticks with nylon or plastic tips that won't wear.

2) The gauge stick should be lowered, not dropped or thrown, into the access port. By lowering the stick carefully, it will remain as close to vertical as possible and give a more accurate reading. The "javelin throw" approach to taking measurements can also damage or puncture the inside of tanks. Careful lowering of the dip stick will prevent removal of the the oxide layer which helps protect the inside of steel tank and/or striker plates, and will prevent puncturing older FRP tanks which may not have striker plates. Some newer tanks have overfill protection devices which employ valves inside the fill pipe. Careful lowering of the stick will prevent damage to these as well.

3) Always "stick" the tank through the same opening. Some tanks have more than one access opening. But, because most properly installed USTs will be sloped 1/8 inch per foot of length, it is necessary to "stick" through the same opening to obtain consistent readings.

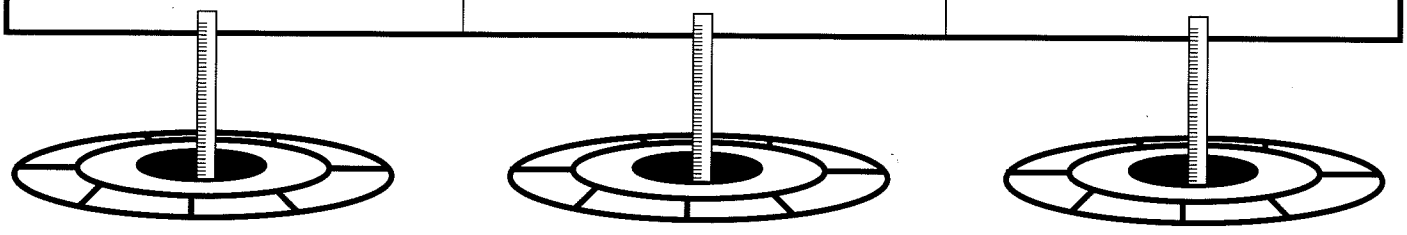
4) If possible, always "stick" the tank through the fill pipe. This is important for a few reasons. First, most gasoline and diesel tanks have a drop tube at the fill pipe which extends from the top of the tank to within about 6 inches of the bottom. This tube helps keep the stick vertical and prevents the tip from striking anything except the striker plate. Second, the fill is usually at the "low" end of the tank. Dipping through this opening allows the operator to check for water in the bottom of the tank.

5) USTs should be checked for water in the bottom of the tank once a month. Water-detecting paste is available from petroleum equipment dealers. This paste can be applied to the end of the dip stick to determine the depth of the water (commonly called the water bottom). When the water bottom approaches 2 inches it should, of course, be removed. If water reappears frequently, it is a good indication that your system is not tight.

6) When carrying dip sticks to and from storage, do <u>not</u> drag them. This will cause the end of the stick to become worn and pointed (a true javelin) and it may dislodge the nylon/plastic tip. In either case, accuracy will be reduced.

Although many newer installations are employing electronic level monitoring devices, we will probably be using the gauge stick for awhile yet. Proper use of sticks will help promote more accurate records for you and more protection of your equipment. ■

Charlie Erdman is Technical Director and Bob Holland is Executive Director of the Association for Composite Tanks.



UST EXCHANGE

The UST Exchange is your forum for promoting the exchange of UST experiences, successes, discoveries, frustrations, and anecdotes. If you have such information, get it off your chest! Write Ellen Frye at NEIWPCC, 85 Merrimac St., Boston, MA 02114, or call 617/861-8088.

Tank Removal...Do Ya Feel Lucky?

by Greg Parker, Wisconsin Department of Natural Resources, Bureau of Solid & Hazardous Waste Management

A FARMER WAS RECENTLY KILLED IN Wisconsin when a tank he was cutting up exploded. Yet, despite this and many similar incidents in other states, there still seems to be widespread skepticism about the explosion hazards posed by tanks. The popular book and video *Tank Closure Without Tears : An Inspector's Safety Guide* (produced by NEIWPCC) analyzes tank safety in terms of the fire triangle, which consists of an ignition source, oxygen, and fuel. Tank explosions can occur only if all three of these elements are present simultaneously. Thus, theoretically, explosion prevention can be achieved simply by eliminating one of these elements. I would like to share my safety concerns within each of these categories.

Ignition Control

At a tank removal I attended last fall, the first thing I noticed was that everyone was smoking, including the local fire chief who was smoking a cigar less than five feet from the tank opening. While people smoke at tank excavations all the time and "nothing ever happens," I am not convinced the risks associated with this activity are negligible or that concerns expressed about such risks are greatly overstated. Given the vast number of tanks which need to be removed - 50,000 in Wisconsin alone - I think there is plenty of opportunity for something to go wrong.

At this same site, I saw the excavator pull out a power saw to cut the fill pipe off of one of the tanks prior to removal. Fortunately, someone convinced him to pry the pipe off, instead. The fact is, such practices go on all the time and are potentially very dangerous. I think both tank removers and inspectors need a lot more education about tank hazards. There needs to be an increased vigilance and willingness on the part of inspectors to enforce the rules of safety.

Vapor Control

Vapor control involves diluting the explosive petroleum vapors in the tank with air to eliminate the fuel side of the fire triangle, a process called purging. The concentration of explosive vapors in a tank atmosphere can fall into one of three ranges: above the upper explosive limit (UEL), within the explosive range, or below the lower explosive limit (LEL). Vapor concentrations above the UEL are too rich to burn. Vapor concentrations below the LEL are too poor to burn. Only vapor concentrations above the LEL and below the UEL are capable of causing an explosive chain reaction.

The process of purging involves taking the tank atmosphere from vapor concentrations in the UEL through the explosive range down to the LEL. *Tank Closure Without Tears* recommends monitoring the tank atmosphere during this process with a combustible gas indicator (CGI). I think it is helpful to review some of the basic operating principles and limitations of CGI's.

A combustible gas indicator is simply an electronic circuit connected to a visual (and/or auditory) display. Combustible gases, including gasoline vapors, are burned by the circuit, or sensor, which operates at a high temperature. This liberates heat which increases the temperature of the circuit, causing it to send a stronger signal to the visual display. The display is scaled in terms of concentrations below the LEL. An instrument reading of 100% indicates vapor concentrations at the beginning of the explosive range.

These basic operating principles raise several safety considerations. First, the CGI must be intrinsically safe; designed so that the combustion occurring in the sensor chamber does not ignite the potentially explosive atmosphere being monitored. There are many CGI's on the market which meet this criteria, so it is not a serious concern. Second, the indicator can only function in an atmosphere which supports combustion (i.e., in the presence of fuel and oxygen). This raises several complex problems some of which have technical solutions and some of which do not.

The first problem is that CGI's will not work properly in oxygen-deficient atmospheres. The instruments will still detect combustible gases, but at a greatly reduced rate. This can lead to inaccurate and misleading results. For example, an oxygen deficient tank atmosphere with vapor concentrations in the explosive range may result in a reading of 15% LEL on the CGI. Properly interpreting such readings requires a thorough knowledge of the process used to inert or purge the tank as well as continuous monitoring and, hence, ultimately depends upon the user. A rule of thumb is always take an oxygen reading prior to taking a CGI reading. The CGI is only accurate when oxygen levels in the tank are atmospheric (20 to 23%).

The second problem is that most CGI's were designed to be personal safety devices as opposed to bonafide atmospheric monitoring devices. Their primary purpose is to detect explosive gases before they build up to explosive levels, so that persons working in the area can leave immediately. They are not designed to monitor a change from an explosive atmosphere to a safe one.

For example, a CGI placed in an atmosphere above the UEL will quickly indicate 100% LEL and then return to zero. This is clearly misleading. Unless the operator is watching the unit continuously and is knowledgeable about this "malfunction," safety can be seriously jeopardized. It seems to me that someone could make a lot of money by developing technology to monitor vapors above the LEL.

■ *continued on page 9*

■ Tank Removal, *continued*

The third problem with the existing technology is closely related to the second. Because CGI's were not designed to operate above the LEL, routinely exposing them to high vapor concentrations makes them difficult to zero and causes them to require frequent calibrations. Many of our field staff have complained about how difficult it is to get an alarmed indicator to shut up after being in a tank. Finally, combustible gas sensors can be disabled by tetraethyl lead, which is still a fairly common gasoline constituent.

Oxygen Control

Oxygen control involves displacing the oxygen in the tank with an inert gas to control the third side of the fire triangle, a process called inertion. I would like to offer a couple of tips on the use of oxygen meters for this purpose. First, choose an oxygen meter with a continuous range of detection (from 0 to 25%). In other words, avoid oxygen meters which are solel designed for personal safety (i.e., 20 to 23%).

Second, do not use your oxygen meter in tanks that are being inerted with carbon dioxide. Carbon dioxide rapidly erodes oxygen sensors; the CO2 from just one tank inertion is capable of destroying a brand new oxygen sensor. Dry ice can still be used confidently if a few basic rules are followed. The American Petroleum Institute (API 1604) recommends using at least 1.5 pounds of dry ice per 100 gallons of tank capacity, distributing the ice evenly throughout the tank, and waiting until all of it has evaporated before proceeding.

"LUSTLine" welcomes reader comments and suggestions on how to cope with these problems.

Compliance Letters Help Target Truant Facilities

by Lisa Lund, Arizona Department of Environmental Quality

The Arizona Department of Environmental Quality implements the UST and LUST programs for the 20,700 regulated tanks and 7,000 facilities in the in the State. As a result of budget problems in the State's general fund, the Department has been limited by the amount of State funds available to the program. Thus, we have limited the focus of the program to outreach activities, program development, and keeping up with two to three LUST cases reported to us daily. Consequently, we have not yet been able to implement an inspections program for existing facilities.

In 1989, when it came time to enforce the leak detection and temporary closure deadlines, we initiated a letter writing campaign. We hoped to narrow down the number of violators to a point at which we could follow through with enforcement, based upon our resource limitations. Initially, we targeted 2,900 facilities that had not met the leak detection deadline and 1,237 facilities with tanks that had been temporarily closed for longer than 12 months. Our data management person (bless her!) prepared a mass mailout to both groups, explaining the requirements and enclosing federal and state guidance materials.

Our first mailings cut our non-compliance rate in half. A second mailing brought that number down to 830 violators of the leak detection deadline and only 50 violators of temporary closure. Letters of Warning were sent to those facilities; we currently have 400 facilities out of compliance. Of those, approximately 90 have sent in schedules for compliance, which are currently in progress.

In our current plan, we divide the remaining facilities into two groups. One group will be inspected by our newly established Inspections Unit; the other group - those facilities we can't inspect during this federal fiscal year - will be invited in for enforcement negotiations. Based on the results of the inspections and meetings, we will go forward with either consent orders or unilateral orders against the facilities that remain in non-compliance.

These are "generic" orders, requiring little preparation time once this point in the enforcement process has been reached. We hope that the letter writing campaign will substantially lower the number of requests for hearings by facilities to appeal these cut-and-dry orders.

Through this process, we have managed to get the word out to the regulated community that we are actively enforcing our UST requirements. We do not believe that this process negates the need for inspecting existing facilities, but it serves as a prioritization tool for targeting inspections. It brings the actual number of violators into realistic proportions so that the enforcement process can be followed through.

Our state assurance fund also gives us an additional hammer; to claim a complete reimbursement from the fund, a facility must be in compliance with all State UST/LUST requirements, must cooperate with the Department, and must operate their tanks with due care. We have found that these eligibility requirements provide incentive to those who are not inclined to comply.

Some problems that should be considered before embarking on this type of letter writing program include:

1) the demand on compliance personnel to answer questions and send out additional information (CRITICAL!),
2) the resources and staff necessary to complete the mailouts, and
3) the never-ending task of updating the database information. ■

Contractor Certification Programs Bloom and Grow

by Joan Cabreza

Contractor certification programs are not news; a few states have had UST installer certification programs for a number of years. In the early stages of the UST program, the Petroleum Equipment Institute, an international trade association concerned with petroleum equipment handling and marketing, had strongly advocated the need for a national certification program.

Several years ago, the timing for such a program would have been perfect, but most states were too busy working on the nuts and bolts of their UST programs to worry about dealing with any additional, non-required programs. Furthermore, state programs were heavily engaged in staffing up and combating the growing numbers of LUST contaminated sites.

However, by 1989, as state programs fell into place, interest in state certification programs began to grow. A wide variety of certification programs began to emerge and, in many instances, helped ease concern that each and every tank installation or removal had to be inspected by state staff. This has been particularly evident in the west, where long travel distances make regulatory oversight of tank comings and goings difficult, at best.

At present, at least 21 states have developed certification regulations and examination requirements, three others (Illinois, Indiana, and North Dakota) have "paper" programs that issue licenses, but require no examinations, and 11 states are actively trying to establish programs. Only 15 states have no programs at all, and their distribution is decidedly geographic; most are located in the south and northeast.

In November, I conducted an admittedly "quick and dirty" telephone survey of state certification programs for the National UST Conference. Although these programs are changing so fast that some of this information may already be outdated, a large enough number of programs are now enough developed that they are worth comparing. The variations also raise a number of interesting questions.

- **Certification Program Fees** - Fees range widely, both in type and amount charged. States like California and Alaska have highly complicated fee structures, charging as much as $900 for a variety of activities that include applications, examinations, study materials, and licenses. Fees may also vary for licensing of individuals and firms, and may depend on the length of time the license is valid. On the other end of the fee scale, states like Mississippi, Washington, and Nebraska charge nothing at all.

Are the "no fee" states missing a golden opportunity for a self-supporting program; or does the good will gained from owners and contractors who already suffer from the costs associated with the tank program offset this? The answer is not clear, although Washington believes that their free exams are responsible for a frustratingly high rate of expensive "no shows" at exam time.

- **Licenses** - Except for California, all existing programs license installers, and many also license removers. California licenses only tank testers, probably the hardest or, at least the most controversial, category to regulate. Alaska, Arkansas, Idaho, Kansas, Oregon, Utah, and Washington also license testers. Region 10 states license the widest variety of categories, including installers, removers, testers, cathodic protection testers, and site assessment/cleanup contractors. Idaho, Iowa, and Montana also certify inspectors, which seems appropriate because the regulator should probably know at least as much as those they regulate. But, does this mean the inspector must pass all of the exams?

Some states, including Alaska, Idaho, Minnesota, Oregon, Washington, and Texas, require separate licenses for installation, removal, and upgrading; others, like Colorado, Iowa, and Kansas issue a combination license. A combination license generally makes it easier and cheaper for contractors, however, the different activities require very different sets of knowledge. Does a combined test result in "watered down" exam content?

While licenses are valid for two years in the majority of states, Colorado, Iowa, Kansas, Montana, Ohio, and Texas have 1 year licenses, and Nebraska has a 3 year license. California offers 1, 2, or 3 year licenses. Wisconsin issues a perpetual license for inspectors.

- **Training and Assistance** - The typical program provides study materials, but only Colorado, Iowa, Minnesota, and Utah require a course. Maine and New Mexico schedule on-site exams to test real-life knowledge; a great idea, but not easy to implement. Maine also requires an installer apprenticeship to insure adequate experience.

- **Continuing Education** - Support for continuing education or other re-license requirements is growing; almost all states require something. There is no average training requirement; the scale ranges from none in California, Florida, and Iowa to 28 hours in Texas. Several states require an additional examination or a retake of the original exam.

- **Management** - Most states run their own certification programs, although several use contractor assistance. Iowa is the only state where a private contractor runs the entire program. Washington and Oregon use a private testing service to administer and grade

SUMMARY OF STATE CERTIFICATION PROGRAMS* (as of 11/90)

ACTIVITY	# OF STATES
CERTIFICATION	
Installers	26
Removers	21
Testers	7
Upgrade/repairs	14
Site assessments/cleanup contractors	1
Cathodic protection testers/design	2
Inspectors	5
States requiring an examination	25
States requiring exam and course	5
License valid	
1 year	9
2 years	14
3 years	3
5 years	1
Training required for renewal	
8 hours	3
15 hours	1
16 hours	1
28 hours	1
Retest/repeat course	5

*Includes programs still under development

examinations. When states use the same testing service or mechanism, this appears to facilitate the development of reciprocal licensing agreements between states.

Sometimes other state requirements unexpectedly complicate state certification programs. For example, Oregon found that to be certified, a contractor also had to obtain a state contractor's license, which required liability insurance and bonding.

Several state license or certification programs are located in agencies different from the UST program. Does this autonomy outweigh the extra coordination needed?

Common Concerns

In spite of the many differences among certification programs, states share many common concerns. Enforcement is a widespread concern; how do you enforce against bad contractors or uncertified people? How do you measure what the contractors really know or how well they carry out their work? How do you measure whether installations, removals, and other tank activities are improved because the program exists? How do you handle reciprocity with other states and still maintain program standards and control? (Oklahoma deals with that one easily, it doesn't allow reciprocity. Region 10 states have taken the opposite approach and are working together to develop a regionwide reciprocity.)

Anyone now pushing for a national certification program faces the dilemma of how to develop such a program when so many different state programs already exist. Indeed, although the idea still surfaces, the optimal time for a national program has probably passed. It is likely that a national program is not the way to go, because so many states are already doing something and in ways that may be uniquely tailored to their needs.

Clearly, the questions and issues are far from answered. But certification programs have made a quantum leap in the past two years, and chances are as states experiment with new approaches and learn from each other, additional improvements will be made. I believe strongly that these programs are likely to be the key to successful implementation of successful UST programs in many states. ■

Joan Cabreza is the EPA UST Coordinator in Region 10. If you would like a detailed summary sheet of Joan's state survey, call 206/553-0344, or FTS 399-0344.

Field Notes

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

UST Industry to Offer "Guided Field Experience" to UST Regulatory Personnel

Think back to the days when you began work at your UST program office. Perhaps it was your first job out of college. Perhaps you had already worked for the state EPA in another department and transferred over when the tank program was established. Then again, maybe the idea of working for the government intrigued you enough that you left industry and joined the public sector work force.

Whatever your educational or vocational background, chances are you did not know much about underground storage tanks when you started in the UST program. Words and phrases like *tank water bottom, rust plug, standpipe test, flex connectors,* and *vacuum extraction* didn't mean much to you at first.

Unfortunately, because the UST program is relatively new, there is not sufficient hands-on training material to acquaint the thousands of professionals in the various state program offices with the many details they need to know. But wait, now the Petroleum Equipment Institute (PEI) and the U.S. EPA are doing something to help fill that void.

PEI and EPA have designed a program in which state and local UST program personnel can learn more about the industry by observing the construction and installation of UST systems and related equipment and services. This jointly sponsored, voluntary program, referred to as a "Guided Field Experience," provides UST regulators and their office staff with an opportunity to observe PEI members installing, maintaining, removing, testing, repairing, and retrofiting tanks and related equipment. By participating in the program, PEI members have the opportunity to demonstrate their products, services, and capabilities to the regulators.

The program is completely voluntary. Neither PEI members nor state and local program staff are required to partake. To date, 34 states and territories have told EPA that they want to be included (see below). PEI members are currently being surveyed to determine the extent of their involvement. PEI will forward a list of participating member companies to EPA headquarters by the end of March. EPA will send this information on to the participating state program directors.

State and local program personnel who wish to avail themselves of this opportunity may contact the volunteer PEI member of their choosing to arrange a mutually agreeable place and time for the guided field experience. As a participant, you will be able to pick-and-choose what you want to observe. The program is designed to be inexpensive (no fees are charged), locally available, and hands-on.

PEI and EPA believe that this is an ideal way to learn by observing how UST systems and related equipment are installed, removed, tested, lined, repaired, and serviced. State and local UST regulatory personnel can find out more about the Guided Field Experience from participating state UST program managers after April 15th.

States and territories participating in the guided field experience program include: Alaska, Arizona, California, Connecticut, Delaware, Washington, D.C., Hawaii, Idaho, Indiana, Kansas, Maine, Maryland, Massachusetts, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Oregon, Pennsylvania, Puerto Rico, Rhode Island, South Carolina, South Dakota, Utah, Vermont, Virginia, Virgin Islands, Washington, West Virginia. It's not too late for states to participate in this program. ■

For more information, contact your EPA Regional Coordinator or OUST's Steve Vineski at 202/475-9723.

EPA HQ UPDATE

UPDATE - State Financial Assurance Funds

The following nineteen states have had their financial assurance fund approved by EPA: Alabama, Georgia, Idaho, Illinois, Iowa, Louisiana, Michigan, Minnesota, Mississippi, Montana, Nevada, New Hampshire, North Carolina, Ohio, Oklahoma, South Carolina, Texas, Utah, and Vermont.

These funds may be used by eligible tank owners and operators to demonstrate compliance with EPA's financial responsibility requirements. Most of these state funds contain some deductible or co-payment that the owner or operator is responsible for paying. Details on the funds are specific to each state and you should contact the state UST program for more information.

Arkansas, Colorado, Florida, Kansas, Kentucky, Nebraska, North Dakota, Tennessee, Wisconsin, and Wyoming have applied to EPA for state assurance fund program approval. Pending approval, owners and operators in these states are considered to be in compliance with EPA's financial responsibility requirements. With or without EPA approval, a total of 43 states currently have UST cleanup funds. ■

UPDATE - OUST Training

OUST is continuing its efforts to develop UST-specific training "courseware" and make it available to state and local governments and the regulated community. Currently:

- **A Leak Detection Train-the-Trainer** course was developed and delivered to state UST staff in Seattle and Chicago last fall and was delivered again in Washington, D.C. in January. Instructor and student manuals will be distributed to course participants and state agencies.
- A **Health and Safety Instructor's Guide** is being developed by EPA's Region 10 UST Office. This UST-specific course is designed to meet the OSHA 24-hour requirement. Once completed, the manual will be distributed to regional and state offices.
- OUST has begun a project to develop **Health and Safety Interactive Video** training. This computer-based course is also designed to meet the OSHA 24-hour requirement. Once completed, course software will be sent to federal and state agencies, and will be offered for sale to the private sector. In a related project, EPA is searching for ways to make the necessary computer equipment easily available.
- OUST is also in the process of developing technical training courses for states to support the concept of the expedited site assessment and pre-approved corrective action technologies. Training courses currently being developed include **vacuum extraction** and **vacuum enhanced free-product recovery.** OUST intends to make these courses available to state agencies in the near future.
- Last but not least, OUST is considering setting up a national training delivery system that includes a **Training Coalition.** The coalition will be a collection of universities, community colleges, or other training entities. These centers will work with EPA to develop and deliver UST courses to the private sector and state and local regulators.

For more information on OUST training activities, contact Steve Vineski on 202/FTS 475-9723 or Peg Rogers on 202/FTS 382-7925. ■

New OUST Publications

- To save you the trouble, OUST has compiled all of those loose leaf summaries on the various leak detection methods into one complete booklet, **Straight Talk on Tanks.** This new document provides basic information on all leak detection options.

To order copies, contact your EPA Regional Office, the RCRA/Superfund Hotline at 1/800/424-9346, or write: U.S.EPA OUST, P.O. Box 6044, Rockville, MD 20850.

- **MUSTs for USTs: A Summary of the Regulations for Underground Storage Tank Systems,** has been revised. The latest edition contains:
  - Updated text,
  - Additional information on tanks eligible for manual tank gauging, and
  - Expanded listings of audio visuals, brochures, and handbooks on USTs, industry codes and standards, and organizations to contact for Tank information.

Copies of "MUSTs for USTs," stock #055-000-00293-2, cost $2.50 each (includes postage and handling). Send requests to: Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
202/783-3238
Pay by VISA or MasterCard by phone or mail (include account number and expiration date) or prepay by check or money order.

- **Field Measurements: Dependable Data When You Need It,** describes several commonly used field measurement techniques and explains how you can use them to make decisions. The guide contains comparisons of common field measurement procedures, descriptions of several procedures, descriptions of the field instruments used with the procedures, a list of manufacturers and distributors, and a glossary of terms.

The guide is intended for state regulators and field personnel who are interested in using field measurement techniques in their programs. Consultants and contractors who perform site assessments will also find the guide of interest. Copies are available at a cost of $5.50 (includes postage and handling) from the U.S. Government Printing Office at the address listed above. Ask for stock #055-000-00368-8.

- **Standard Test Procedures for Evaluating Leak Detection Methods,** is a series of publications that present, in detail, highly technical procedures for testing the following types of leak detection:
  - Volumetric Tank Tightness Test Methods
  - Non-Volumetric Tank Tightness Test Methods
  - Automatic Tank Gauging Systems
  - Liquid-Phase Out-of-Tank Product Detectors
  - Vapor-Phase Out-of Tank Product Detectors
  - Statistical Inventory Reconciliation Methods
  - Pipeline Leak Detection Systems

Manufacturers can use the methods put forth in "Standard Test

■HQ Update, *continued*

Procedures" to evaluate their equipment. They can summarize their results on the short form provided in each Handbook. Manufacturers can distribute the forms to tank owners and state and local regulators, who can use them to verify that the method being described meets EPA standards. Tank owners and government regulators, while benefitting from the results of the testing, are not likely to need the actual, detailed test procedures.

For more information or to obtain copies, contact your EPA Regional Office, the RCRA/Superfund Hotline at 1/800/424-9346, or write: U.S. EPA OUST, P.O.Box 6044, Rockville, MD 20850. ■

TANK BITS

Rhode Island Corrals Major-Owned Facilities for Compliance Enforcement

THE RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (DEM) is taking a new tack with compliance enforcement. The Agency has initiated compliance reviews with major oil companies that own facilities in the State. Instead of dealing with each facility individually, DEM is identifying all of the deficiencies at the facilities owned by each company at one time, so that the companies can address them all at once.

"We seem to be getting cooperation," says Sue Kiernan, Deputy Chief of the State's Groundwater program. "One visit by car or plane can save the company a lot of trips and take care of a lot of business. It's more efficient for them and for us. We can do a lot of the work from the office by using records.""

"Hopefully, as result of these discussions, we can come to some agreement on a compliance time frame, which can then be cemented into a consent agreement. In theory, this is a cost-effective way to get registration deficiencies corrected, leak detection violations resolved, recordkeeping, spill containment, and overfill protection sorted out. I'm sure it won't all go smoothly, but it makes a lot of sense," says Kiernan. ■

Minnesota Tank Owners Who Hire Uncertified Contractors Risk Losing State Fund Reimbursement

THE MINNESOTA POLLUTION CONTROL AGENCY (MPCA) requires that tank owners use only State-certified contractors for installing, repairing, or closing USTs. In fact, tank owners who hire an uncertified contractor for tank closure work risk losing some or all of their financial reimbursement from the state Petrofund. The Petro Board, which administers the leak cleanup reimbursement fund, can drastically reduce a tank owner's possible reimbursement - which is usually 90% of eligible costs.

To be state-certified, contracting companies must employ at least one supervisor who: has a minimum of two years of work in tank service; has taken a 5-day training course approved by the State; and has passed a written exam based on that training. The company must also provide proof that it has adequate financial resources to pay for cleanup of any problems that it might cause while working on a tank. The MPCA reports that there are approximately 174 certified contractors and 362 certified supervisors in the State to date.

To check on the contractor's status, tank owners can ask to see the company's certificate (a photocopy must be posted at all job sites) and the supervisor's wallet-card certification. The MPCA provides a list of State-certified contractors. ■

API Considers a Nationwide Contractor Certification Program

THE AMERICAN PETROLEUM INSTITUTE (API) IS GIVING SERIOUS consideration to developing a tank installer and remover training/certification program. The API is leaning toward providing training through an individual study program, testing at specified locations, and certifying that the individual passed the test and demonstrated knowledge of the subject.

API's Rudy White says this kind of program provide a basis for reciprocity with existing and evolving state programs. API's program could be adapted to specific state needs. State agencies could apply this training and certification as a requirement for licensing programs.

White says improved installation and removal practices play an important role in groundwater protection, which would be the goal of the API certification program. "The objective is to get to the guys in the trenches who are actually doing the work. They are the one who will make a difference."

The die has not yet been cast, however. API is still making some decisions. We'll keep you posted. ■

New API Publication on Cleanup Treatment Effectivness Available

THE AMERICAN PETROLEUM INSTITUTE (API) HAS PUBLISHED *A Compilation of Field-Collected Cost and Treatment Effectiveness Data for the Removal of Dissolved Gasoline Components from Groundwater*. The study was conducted to document, summarize, and evaluate cost and treatment effectiveness data for air stripping and carbon adsorption systems designed to remove dissolved petroleum hydrocarbons from groundwater. The compounds of primary interest were benzene, toluene, ethylbenzene, and xylene isomers (BTEX) as well as the oxygenates methyl-tertiary-butyl ether (MTBE) and isopropyl ether (IPE).

Operating data were gathered from 57 field sites throughout the United States. Treatment system profiles were generated for each site. The data will be used to assist companies in planning pump-and-treat remediation systems for removal of BTEX and oxygenates from groundwater.

The document (order #841-45250) is available to API members for $24.00 ($30.00 for non-members) from API Publications & Distribution Section, API, 1220 L St. N.W., Washington, D.C. 20005. Phone 202/682-8375; Fax 202/682-8537. Prepaid orders should be sent to API, 1970 Chain Bridge Rd., McClean, VA 22109-6000. ■

Petroleum Marketers Seek New Federal Financial Responsibility Legislation

by Jeffrey L. Leiter, Esq.

There has been a confluence of events in recent months in the petroleum UST financial responsibility area that suggests additional Federal legislation is necessary. Gasoline marketers propose that such legislation, if enacted, should distribute funds from the reimposed Leaking Underground Storage Tank (LUST) Trust Fund tax to EPA-approved state UST trust funds for the purpose of accelerating corrective actions.

Recent Developments

The principal regulatory "heartburn" for UST owners and operators, particularly gasoline marketers, continues to be the Federal petroleum UST financial responsibility regulations. According to a December 1990 survey of their members' compliance activities, the National Association of Convenience Stores (NACS), Petroleum Marketers Association of America (PMAA), and Society of Independent Gasoline Marketers of America (SIGMA) found that 25 percent of the respondents still do not have any financial assurance mechanism in place for their tanks. While this percentage shows an improvement from the survey taken a year earlier, the number of gasoline marketers unable to demonstrate the required evidence of financial responsibility remains disturbing.

The NACS, PMAA, and SIGMA survey indicates that 73 percent of the USTs owned by gasoline marketers are covered by a financial assurance mechanism that relies on EPA-approved or submitted state UST trust funds. This percentage is up sharply from the survey of a year ago, while the number of tanks covered by private pollution liability insurance has declined dramatically.

The enactment and implementation of state UST trust funds has moved at a good pace. However, concerns are being raised that many of the state funds are or will be underfinanced to meet their obligations, thereby frustrating the intent of the funds and undermining protection of the environment.

Because of numerous reasons, UST owners and operators, including gasoline marketers, have found it increasingly more difficult to borrow funds for UST-related activities, such as tank upgrades, replacements, and leak detection. Lenders' reluctance or, in some cases, refusal to make UST loans also is affecting corrective actions.

Congress, beginning December 1, 1990, reimposed the 0.1 cent per gallon LUST Trust Fund tax for five years. Because much of the original $500 million fund for "orphan" and catastrophic tank leaks has not been appropriated, the new collections are being used to show a reduction in the Federal budget deficit.

The above developments should be viewed in context with the Federal UST regulations. Assuming that EPA is not anxious to modify its UST financial responsibility requirements, the time is ripe for Congress and others, including state UST regulators, tank owners and operators, and environmentalists to consider legislative changes to improve the UST regulatory program and protect the environment.

The NACS, PMAA, and SIGMA Proposal

The three gasoline marketing groups have been circulating a legislative "straw man." The "guts" of the proposal is that the monies collected from the reimposed LUST Trust Fund tax be distributed to EPA-approved state UST trust funds. NACA, PMAA, and SIGMA still seek a healthy private leak insurance market.

Under the proposal, the Federal UST financial responsibility compliance deadlines would be altered. Compliance would be required when an UST is upgraded or replaced or when a tank site has undergone corrective action. Arguably, the location is "clean" and would be an attractive risk to private insurers. At a minimum, insurers could better quantify their risks and premium costs should be more affordable. Until compliance is required, the state trust fund would provide the financial assurance Congress originally intended.

Because trust fund financing mechanisms may not be adequate to cover obligations, the LUST Trust Fund monies collected over the original $500 million would be allocated to EPA-approved state trust funds on a formula basis determined by Congress or the Agency. This distribution would provide the political incentive for states without trust funds to enact them.

Under the gasoline marketers' proposal, the distributed funds would go to accelerate UST cleanups. However, a state might have the option to set aside a percentage of the distribution for financial assistance to certain eligible tank owners or operators.

In theory, the proposal would accelerate cleanups, because the state would be making decisions on the pace and extent of corrective actions, while at the same time attempting to "husband" or maximize the available monies in the fund.

Also, the states would have an incentive to streamline fund-financed cleanups, because once the LUST site is cleaned up, the owner or operator would "kick out" of the fund coverage and would be subject to demonstrating the required levels of financial responsibility using other private assurance mechanisms, primarily insurance.

Any Questions or Comments?

The gasoline marketers have put forth their proposal as a starting point for serious discussions on further legislative modifications to the Federal UST financial responsibility regulations. NACS, PMAA, and SIGMA invite questions and comments. Contact: Jeff Leiter, 202/342-8490; Lindsey Hutter at NACS, 703/684-3600; or Barbara Faulkner at PMAA, 202/331-1198. ■

Jeff Leiter is an attorney with Collier, Shannon & Scott, counsel to the National Association of Convenience Stores and the Society of Independent Gasoline Marketers of America.

To our Readers:
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To Make the Punishment Fit the Crime...

EPA Provides Guidance on Assessing Civil Penalties for UST Reg Violations

EPA has issued a new directive, *U.S. EPA Penalty Guidance for Violations of UST Regulations*, which puts forward a fascinating approach to assessing civil penalties. Although the document is intended for EPA Regional enforcement staff, it employs concepts and methodologies that may prove useful to state and local UST implementing agency enforcement programs as well. The document's credo is aimed at achieving three goals:

- Encourage timely resolution of environmental problems;
- Support fair and equitable treatment of the regulated community; and
- Deter potential violators from future violations.

EPA's operating theory is that "to deter the violator from repeating the violation and to deter other potential violators from failing to comply, the penalty must place the violator in a worse position economically than if he or she had complied on time."

To achieve this deterrence, the Agency sets up an assessment framework that addresses two approaches: a traditional penalty approach, which involves economic benefit and gravity-based components, and a field citation approach, which involves a pre-established non-negotiable penalty that is applied to certain types of violations and that encourages compliance without a drawn-out appeals process.

The "Economic Benefit Component"

The "economic benefit component" is designed to remove any significant economic benefit that the violator may have gained from noncompliance. It is based on the benefit from both avoided costs and delayed costs. Avoided costs are the operation and maintenance expenditures that the owner or operator should have incurred to be in compliance, but did not. Delayed costs are the expenditures that have been deferred by the violation, but will be incurred to achieve compliance.

Economic Benefit = Avoided Costs + Delayed Costs

The "Gravity-Based Component"

The "gravity-based component" imposes an assessment that penalizes current and/or past non-compliance to ensure that violators are economically disadvantaged relative to owners or operators of facilities in compliance. This entails charging an additional amount, based on the specific violation and circumstances of the case, to penalize the violator for not obeying the law. It also allows for adjustments that reflect the specific circumstances of the violation, the violator's background and actions, and the environmental threat posed by the situation.

The gravity-based component consists of four elements:

- **Matrix value** - based on the extent of the deviation from the requirement and any actual or potential for harm.
- **Violator-specific adjustments to the matrix value** - based on the violator's cooperation, willfulness, history of noncompliance, and other factors.
- **Environmental sensitivity multiplier (ESM)** - a value based on the environmental sensitivity associated with the location of the facility.
- **Days of noncompliance multiplier (DNM)** - a value based on the number of days of noncompliance.

Gravity-Based Component = Matrix Value X Violator-Specific Adjustment X ESM X DNM

The extent of deviation and potential for harm factors of the matrix value break down into major, moderate, and minor violation categories, which are listed in the document's appendices. For example, *failure to provide a release detection method that meets performance requirements* or *failure to maintain records of each repair to a UST* are considered to be major violations in both categories. Whereas a violation such as *installation of inadequate overfill prevention equipment in a new tank* is considered a major deviation from the rule, but a moderate potential for harm.

Economic Benefit + Gravity = Penalty

The penalty guidance document spells out exactly how each factor in the equations can be determined. Ultimately, the economic benefit component is added to the gravity-based component to arrive at the initial penalty target figure assessed in the complaint. After the initial penalty has been presented to the violator, additional adjustments may be made as part of a settlement compromise.

Enforcement Procedures

Another EPA document, *UST/LUST Enforcement Procedures Guidance Manual* released in July 1990, provides guidance to EPA Regional personnel on the range of enforcement actions that may be taken in response to a violation of the UST technical requirements.

The enforcement options vary from initial responses, such as warning letters or notices of violation (NOVs), which encourage compliance, to more stringent actions, such as administrative orders and judicial injunctions, which compel compliance and, if appropriate, penalize violators. In general, enforcement personnel are directed to take enforcement actions that are less costly, but that serve to achieve compliance and create a strong deterrent. If initial action fails to budge the intractable violator, then the severity of the enforcement response will escalate in kind.

The document also addresses field citations as an alternative enforcement response option in certain situations. Similar to traffic tickets, they are essentially modified compliance orders issued by inspectors on-site at a facility. The use of field citations is generally limited to first-time violators in cases where compliance is expected and the violation does not pose an immediate threat to human health and the environment. As stated earlier, a typical field citation assesses a pre-established, non-negotiable penalty, which is usually fairly low (e.g., $100). ■

To obtain copies of OSWER Directive 9610.11, "UST/LUST Enforcement Procedures Guidance Manual," or OSWER Directive 9610.12, "U.S.EPA Penalty Guidance for Violations of UST Regulations," call the OUST Docket, 202/475-9720, or the OUST Hotline, 1/800/424-9346.

■ **Honest Tank,** *continued from page 3*

What Is All This Stuff?

Just as no two sets of finger prints are the same, no two UST facilities are the same. The real story of what's happening with the UST tank and piping system lies buried. At first glance, the inspector sees only product dispensers, labeled or unlabeled manhole covers, collections of vent pipes, patches of asphalt where something may have been installed or removed, perhaps some staining where a fill or overfill spill occurred, and they can get a sense of cleanliness. At first glance, a facility might appear dull.

But walk around a facility - any facility - with an inspector who has been on the beat for a while and you'll find yourself, tra lah, on a magical mystery tour. A manhole is uncovered. Inside, an ant's nest is stirred, beetles scurry. Note, the greasy grubby pump, no sign of a leak detector. What about that cover? A newly installed groundwater monitoring well? The inspector gets her gauge stick to check for slots and depth to water. Note, no water. The groundwater monitoring well has no water.

The inspector asks the facility operator if there are inventory records. The operator says the fuel delivery company keeps track of when the tank is getting low. Hmmm. As you look around, the facility begins to take on a life of it's own.

The inspector is comparing his (or her) agency's registration records with reality, and they often either don't match or need work. For example, the registration form may say that the three steel tanks have cathodic protection, but the the inspector can find no test station, no lead wires, and no record of documentation. If the owner insists the system is cathodically protected, then he bears the burden of proof. "Have the system professionally tested, documented, and send us the results."

"Sometimes people really don't know what they have out there," says Christina Graulau with the San Diego County Department of Health Services. "There is quite a bit of mystery at the older facilities - situations where no one knows exactly where the piping runs or if there were additional tanks that have been abandoned."

Sometimes inspectors must point out to the tank owner that he doesn't have something he apparently thought he had. Because many tank owners don't know what half of this tank and piping stuff is, let alone recognize it, if they have invested in equipment in good faith and are short changed, they may not realize it.

At first glance, a facility might appear dull. But walk around a facility - any facility - with an inspector who has been on the beat for a while and you'll find yourself, tra lah, on a magical mystery tour.

"The other day one of our inspectors opened the monitoring box to an automatic tank gauge system and there was nothing in it...nothing at all," recalls Calloway. If there is a box on the wall associated with an automatic monitoring system, the inspector should ask the operator to show that the system is operational.

UST regulators are scrambling to keep up with how to verify the various things that UST facilities are required to have. "How do we as regulators know that they are using acceptable equipment and using it properly," says Graulau.

"Equipment is the biggest problem," she explains, "the pros and cons. We are trying to develop a reporting format to get some consistency for our files. For example, we would like owners and operators to provide a written monitoring procedure and information on what their equipment does and doesn't do. We would like them to provide annual certification that their equipment works."

The Road to Compliance

The inspector takes notes...in ink...documentation. After a while, when the story of the two 25-year old 8,000 gallon tanks has taken shape, the inspector sits down with the operator and has a talk. It appears there are a number of violations. They go over the check list on which violations have been noted.

The inspector explains the deficiencies and how they can be corrected. He points out some non-regulatory good housekeeping hints. He explains the leak detection options. "Well sir, if you have chosen groundwater monitoring, then you don't have enough wells to adequately cover your tanks. Furthermore, you need to check the wells monthly and keep records. If you are going to do inventory control in combination with tightness testing, then you must still keep those records *and* do your monthly reconciling, and you must be able to show me that you have had the tank tested."

He explains to the operator that he has 30 days to bring the facility into compliance. He tries to make sure the operator understands what needs to be done and asks him to sigh the bottom of the checklist form. He does. The inspector gives him a copy for his records.

This is one scenario that has worked well for regulatory agencies with facility inspection experience. Inspection checklists provide consistency. Many jurisdictions begin enforcement with notices of violation and move up the enforcement ladder if non-compliance persists. A few jurisdictions have employed field citations, which are like traffic tickets, for minor violations.

"Initially I'll determine the degree of the violation," explains Herb Meade, Supervisor with the Maryland Department of Environmental Protection. "If it is something that must be corrected immediately, like not doing release detection, then I write a site complaint and require correction within a certain number of days or, in some cases, a certain number of hours.

"If I find a very serious violation, if I suspect there may have been a release from a particular tank, for example, then I will shut that pump down until corrective action has been taken.

"If it's a case where inventory hasn't been kept in a way I can understand or that meets our regulations, then I'll work with them. Usually, an initial inspection will require follow-up."

Thorough documentation, including photos, is an important part of the inspection procedure in the event of future enforcement actions. "Documentation is also important because if the original inspector has left the agency, anyone can pick up a case and make sense of it," says Caporale.

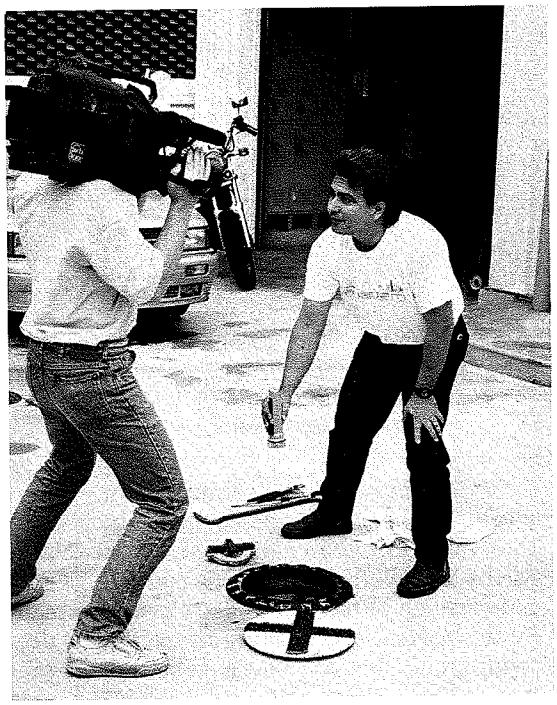
Training, Training, Training

Of course, the job of enlightening the regulated community requires enlightened inspectors. Although federal UST rules set forth minimum requirements, most states and/or localities have their own UST regulations and policies that may be more detailed or stringent.

"It is important to have a structured inspector training program," says Caporale. "Inspectors should study the regs carefully. You don't want to have inspectors out in the field giving operators incorrect or imprecise interpretations of the rules. The idea is to educate not to confuse."

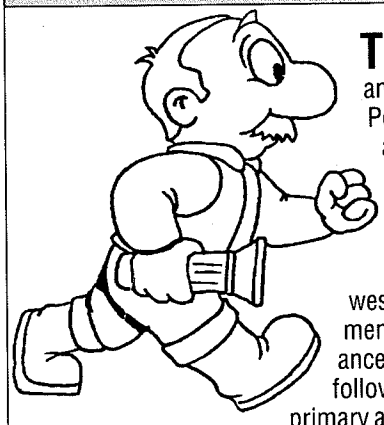
Among tank owners and operators, the distinctions between such regulated items as "suction" versus "pressurized" line delivery systems or between "spill" and "overfill" protection remains equivocal. To some, the task of selecting of a tank tester begets pangs of apprehension. To some, terms like "cathodic protection" or "float vent valve" are, at best, cryptic.

The technical standards for petroleum USTs bring a host of questions and terms which inspectors must understand themselves in order to answer. As deadlines kick in and new hardware appears on the scene, inspectors will need to know what to look for and what they are looking at. "We try to keep up with all the technical developments and pass the information on to our field inspectors," says Graulau. "But it takes field experience to see the nuances of how things really work." ■



On location: Amando Villanueva, Dade County D.E.R.M., searches for the honest tank in NEIWPCC's newest video.

NEIWPCC's New Video & Companion Booklet Deal With UST Facility Compliance Inspections



To shed some light on the subject of facility compliance inspections, the New England Interstate Water Pollution Control Commission (NEIWPCC) has just about completed a new EPA OUST funded video and accompanying booklet titled, you guessed it, *Searching For The Honest Tank: A Guide to UST Facility Compliance Inspections.*

The video stars five UST regulators from east to west and covers inspection priorities, protocol, equipment, documentation, recordkeeping review, compliance with technical standards, and enforcement and follow-up. While state and local inspectors are the primary audience for this material, the information provides compliance insight for tank owners and operators as well.

EPA regions and states will receive copies sometime in April. Copies of the 33-minute video and companion booklet can be ordered at a prepaid cost of $40.00 (shipping and handling included) from NEIETC, 2 Fort Rd., South Portland, Maine 04106. Make checks payable to NEIETC. The video and booklet can also be borrowed from NEIETC for $10.00.

EPA Extends Compliance Date for Pipeline Leak Detection Leak Rate Requirement

Because EPA's standard test procedure for evaluating pipeline leak detection systems was not distributed until October 1990, the Agency decided that manufacturers of this equipment may not have had adequate time to evaluate their systems by the December 22, 1990 compliance date. The Agency was concerned that if some of the major manufacturers of automatic line leak detectors could not complete their evaluations on schedule and withdrew their products from the market, a potential shortfall of equipment could cause widespread noncompliance.

Thus, in the January 2, 1991 Federal Register there is a minor amendment to the original September 23, 1988 Final Rule (53 FR 37145) under Subtitle I of RCRA. The amended version extends for 270 days (or until September, 1991) the time frame that owners and operators have to meet the requirement in paragraph 280.40 (a)(3) that newly installed automatic line leak detectors must meet a specified leak rate (under specified conditions) with a probability of detection of 0.95 and a probability of false alarm of 0.05.

The preamble to the final rule stated that manufacturers of automatic line leak detectors would have time to ensure that their methods met the standards of the rule. To this end, EPA developed test procedures and published them in a series of seven guidance documents called Standard Test Procedures for Evaluating Leak *Detection Methods* (see *HQ Update*). *Pipeline Leak Detection Methods* was the last in this series.

Owners and operators of new and existing USTs are still required to equip all pressurized piping with automatic line leak detectors and either have an annual line tightness test or begin monthly monitoring by December 22, 1990. Also, all automatic line leak detectors are still required to detect 3 gallons per hour at 10 pounds per square inch within one hour.

For additional information, contact the RCRA Hotline at 800/424-9346; for the hearing impaired, call TDD 800/553-7672. In Washington, D.C., the numbers are 202/382-3000 and TDD 202/475-9652. ■

A Mean, But Not Lean, Soil Vapor Survey Boot Camp

A GROUP OF TWENTY UST STATE program personnel of *Pan*-American origin were assembled under a yellow and white striped tent at a former gas station, the site of a heretofore identified gasoline release, at the University of Connecticut in Storrs, Connecticut. They were working in small groups, each engrossed in taking soil vapor, carbon dioxide, and oxygen measurements with a variety of field measurement instruments. Borings had been drilled through the asphalt and into the soil. Presiding over the group were U. Conn's Dr. Gary Robbins, his complement of graduate students, and a scientist from the Midwest Research Institute (MRI).

Trainees performing soil vapor survey manuevers.

Under a grant from EPA's Office of Underground Storage Tanks, Robbins has spent over three years studying the factors influencing soil vapor measurements. During the past year, the insights reaped from this effort have been passed on to about 120 state program personnel in the form of an EPA sponsored "Soil Vapor Survey Boot Camp" - three sessions in Connecticut and one in Minnesota. Aptly named, the "boot camp" involves about four days of rigorous classroom, lab, and field training; an experience that has gotten high marks from its "boots."

"I think this training will help us in getting real time data about a site right away," says Jay Fumusa with the Arizona Department of Environmental Quality. "With the instruments and the know-how we can quickly appraise the extent of a groundwater or soil contamination plume. The course also introduced some new techniques I've never seen before, like monitoring CO2 and O2."

Pat Ellis of the Delaware Department of Natural Resources and Environmental Control said she was sent to the course to see how the soil surveying techniques work, what they are useful for, and what the limitations are. "What I have learned will be very helpful for interpreting data reports that people are sending us."

"This will be very useful in the Coastal Plain areas where I work," says Mike Macicak with the North Carolina Department of Health, Environment, and Natural Resources. "We've been doing soil gas surveying for a while, but we've learned here how some of our techniques can be improved."

"Opening our eyes to an unknown world' has been a prevailing theme in the evaluations we've received," says MRI's Elizabeth Jones, who coordinated much of the training. "Participants learned the limitations of the equipment they are using, which is not widely known. They also learned techniques to compensate for their particular instrument's limitations.

"They are also better able to evaluate reports from consultants with confidence - which is really the heart of the matter. A regulator can decide if a report provides good information, or a lot of hot air. He or she can say with confidence what the consultant needs to go back and do. Regulatory agencies have a lot of interest in this kind training."

"I review a lot of reports from consultants," explains Walt Carlson of the New Hampshire Department of Environmental Services. "I feel more comfortable about evaluating their methodology and interpreting their reports. For example, the flame in a flame ionization detector could have gone out if there was low oxygen in the sample. The consultant might report zero contamination. If we have reason to be suspicious of this we can ask them to go back and measure CO2 levels."

What's It All About?

The boot camp teaches several soil vapor surveying techniques that can provide UST/LUST personnel with an increased level of reliable information about contamination over a large area, in real time, at a reasonable cost, using readily available equipment. Soil vapor surveys can be extremely helpful in UST-related site investigations if the limitations of each approach are understood and the data are evaluated appropriately.

"We're letting the people in this course use a whole variety of instruments so they can evaluate the responses," explains the contagiously enthusiastic Robbins. "With field measurement instruments you can get a direct indication of where a problem is by measuring organic vapors. You can get a more indirect indication of where the problem is by measuring the oxygen and carbon dioxide. Where there has been a spill, the carbon dioxide increases and the oxygen decreases. As you get to the outer limits of the plume the oxygen increases."

"Right now we do things blindly and wait and see what happens," says Robbins. "For soil samples or vapor samples you get different gradations depending on depth. But common practice is to take unrepresentative samples, send then to a lab, wait for the results, then go back and take more samples. Why spend money to get qualitative information on a small sample when that sample does not represent field conditions? Field screening codifies information in an inexpensive way. It's the way to go for cleaning up hundreds of thousands of sites."

A variety of instruments are available for field measurement - flame ionization detectors, photoionization detectors, explosimeters, gas chromatographs, colorimetric detector tubes, oxygen meters, and carbon dioxide meters - but proper techniques for using them are still developing.

"The ways in which these instruments are commonly used can create gross errors," says Marcel Moreau a petroleum storage specialist who attended the course in Minnesota. "If you don't know what you are doing you can get erroneous results. You can underestimate by orders of magnitude."

Soil vapor surveying can be used as an investigation tool: to rapidly evaluate a site, to monitor subsurface tanks, impoundments, and landfills, and to track remediation effectiveness.

The basic soil vapor survey procedure consists of inserting a pipe in the ground, pumping soil air from the subsurface, and conducting an

■ *continued on page 19*

A Toxicity Characteristics Rule Cheat Sheet

*In **LUSTLine's** Bulletin #13 article, **A Hazardous Waste, Or What?**, we discussed EPA's new rule that establishes a toxicity characteristics (TC) test for determining whether a waste contains hazardous characteristics. This rule includes a provision that defers from regulation under Subtitle C, "petroleum-contaminated media and debris" that fail the TC test and are regulated under RCRA's Subtitle I UST corrective action requirements. Under Subtitle C, if these materials had failed the TC test, they would have been regulated as hazardous wastes and, therefore, subject to RCRA's "cradle to grave" hazardous waste management system. This deferral only applies to the 25 newly listed organic chemicals. The following "Cheat Sheet" is a rough reference for what's deferred and what's not deferred within the context of this rule. The fine points of interpretation (and there are fine points) are not included:*

1. Which UST-related "Petroleum Contaminated Media and Debris" are we talking about?

Deferred	Not Deferred
Materials outside the UST: Soil (before & after treatment) Groundwater (before & after treatment) Floating Plume Surface Water Rock, Grass, Stumps Empty Tanks (per Subtitle I definition) Piping	Materials inside the UST: Sludge Water Product Tanks with product or sludge in them

2) How do we know which materials are subject to "UST corrective action requirements?"

Deferred	
Materials listed above as deferred, if generated in response to known or suspected releases from a petroleum UST (including contamination found at closures, site assessments, and replacements).	

3) How do we know which materials are subject to Subtitle I of RCRA?

Deferred	Not Deferred
Materials from USTs as defined in Section 9001 of RCRA and EPA's technical regulations.	Materials from Non-Subtitle I tanks, e.g., heating oil tanks, farm & residential motor fuel tanks < 1,100 gals., and above-ground tanks. However, under Subtitle C of RCRA, all wastes generated from households (single and multiple residences) are excluded from EPA's hazardous waste management regulations. For USTs, this includes contaminated soils from household heating oil tanks and household carbon filter units.

Unresolved Issues:

4) What is the status of newly generated wastes (e.g., spent carbon) resulting from treatment of petroleum contaminated debris? As yet, these residual materials have not been designated as deferred.

5) What about above-ground tanks, pipelines, and spills which are not deferred under the rule? EPA is considering a New York State petition that calls for deferring above-ground tanks, pipelines, and spills from the TC requirement in states with adequate management programs.

■ Soil Vapor, *continued from page 18*

analysis. While sampling the soil air is a relatively simple concept, various approaches are used depending on the survey goals and the equipment available. It is important to use proper methodology and interpret the data correctly.

EPA is encouraging universities and private training organizations to offer this course. The Agency hopes to see a few more offered this spring and summer.

State UST agencies should contact their Regional EPA UST program offices for more information on upcoming training sessions. Non-regulatory folk who are interested in the status of any such training sessions or who would like to offer a training session should write Elizabeth Jones at:MRI, 5109 Leesburg Pike, Suite 414, Falls Church, VA 22041 or phone 703/671-0400. ■

"What Do We Have Here?" - the Booklet - *Now Available*

At last, the companion booklet to NEIWPCC's video, *What Do We Have Here?...An Inspector's Guide to Site Assessment at Tank Closure*, is available - $5.00 per copy or $45.00 for booklet and video. The booklet covers topics discussed in the video in a bit more detail. The video is actually 3 videos on one tape, a 30-minute feature presentation on site assessment at tank closure, plus 2 short presentations, one on field testing instruments (14-minutes) and another on soil and water sampling (7-minutes).

What Do We Have Here? is the second video on tank closure produced by NEIWPCC with a grant from EPA's OUST. The first video and companion booklet, *Tank Closure Without Tears*, deals with safety issues. NEIWPCC's soon to be released third video and booklet, *Searching for the Honest Tank: A Guide to UST Facility Compliance Inspections*, is discussed on page 17.

NEIWPCC videos and booklets can be purchased or borrowed through NEIWPCC's Environmental Training counterpart, NEIETC, 2 Fort Rd., South Portland, ME 04106. Loans are available for the prepaid charge of $10.00.

Straight Talk on Leak Detection

with Joe Thursday,
Leak Detective

The EPA Office of Underground Storage Tanks (OUST) has recently completed a video on leak detection options available to tank owners and operators under federal UST regulations. In Straight Talk on Leak Detection, Detective Joe Thursday presents a fast moving overview of the various leak detection methods and points out some pros and cons owners and operators need to consider in selecting their systems. The 25-minute tape also has a 5-minute introductory segment, Straight Talk From Tank Owners, in which real folks share some of their frustrations and confusion over UST regulatory musts.

The video was well received in previews at the National Association of Convenience Stores (NACS) Convention in September and the Petroleum Equipment Institute (PEI) Convex in October. These organizations represent tank owners and the UST industry.

EPA has distributed copies of the video to EPA Regional Offices and to state UST agencies who may choose to loan them to interested owners or operators. The tape can be purchased for $40.00 from its producer, the non-profit Environmental Media Center. Call 800/522-0362 or, for those in the Metro D.C. area, 301/229-1944, or write: P.O. Box 30212, Bethesda, MD 20814.

Vapor Surveys and Vacuum Extraction

OUST is currently preparing a video that deals with two methods to get improved petroleum cleanups underway faster - vapor surveys and vacuum extraction. OUST projects that thousands of leaks will continue to be discovered. To help address this problem, OUST will use this video to present new methods that can be used to avoid the time delays and expenses usually associated with lengthy cleanups. These site investigation and cleanup techniques offer ways to quickly delineate and remediate contamination. In this business, quick action means lower costs to cleanup contamination that hasn't had time to travel too far.

The video, being produced by the Environmental Media Center, is designed to supplement lecture, lab, and field work courses that EPA has been developing on these subjects. The material is intended for both the regulatory and consultant/contracting communities. For more information on the courses, contact Elizabeth Jones, Midwest Research Institute, at 703/671-0400.

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