of an education and certification program for service station attendants.

■ Tanker Driver Certification and Training

Tanker driver training programs and materials have been available for years and have surely produced benefits. However, further refinements and improvements can be made to help reduce overfills and surface spillage. Possible future improvements include:

- More rigorous training programs for all tanker drivers, including lessons on drivers' roles in avoiding and reducing spills, spill response and reporting, tank gauging, the purpose and function of overfill protection devices and spill boxes, vapor recovery systems, and health and safety.
- Consistent certification requirements for all tanker drivers (Note: U.S. Department of Transportation requirements already exist).

■ Regulatory Enforcement

Enforcement of the existing UST regulations is a key part of ensuring compliance and preventing fuel losses from UST systems. To improve the enforcement process, some possible future improvements include:

- Consolidation of regulations to reduce overlap and improve clarity.
- Expanded training for regulatory inspectors and verification of the uniformity of that training.

Improvement Must Be Ongoing

Some UST owner/operators and regulatory bodies are already implementing some of these practices. They are to be commended for their progress. Nevertheless, more improvement is possible. By continuing to develop and implement improved management and operation practices, fuel losses from USTs can be reduced even further. ■

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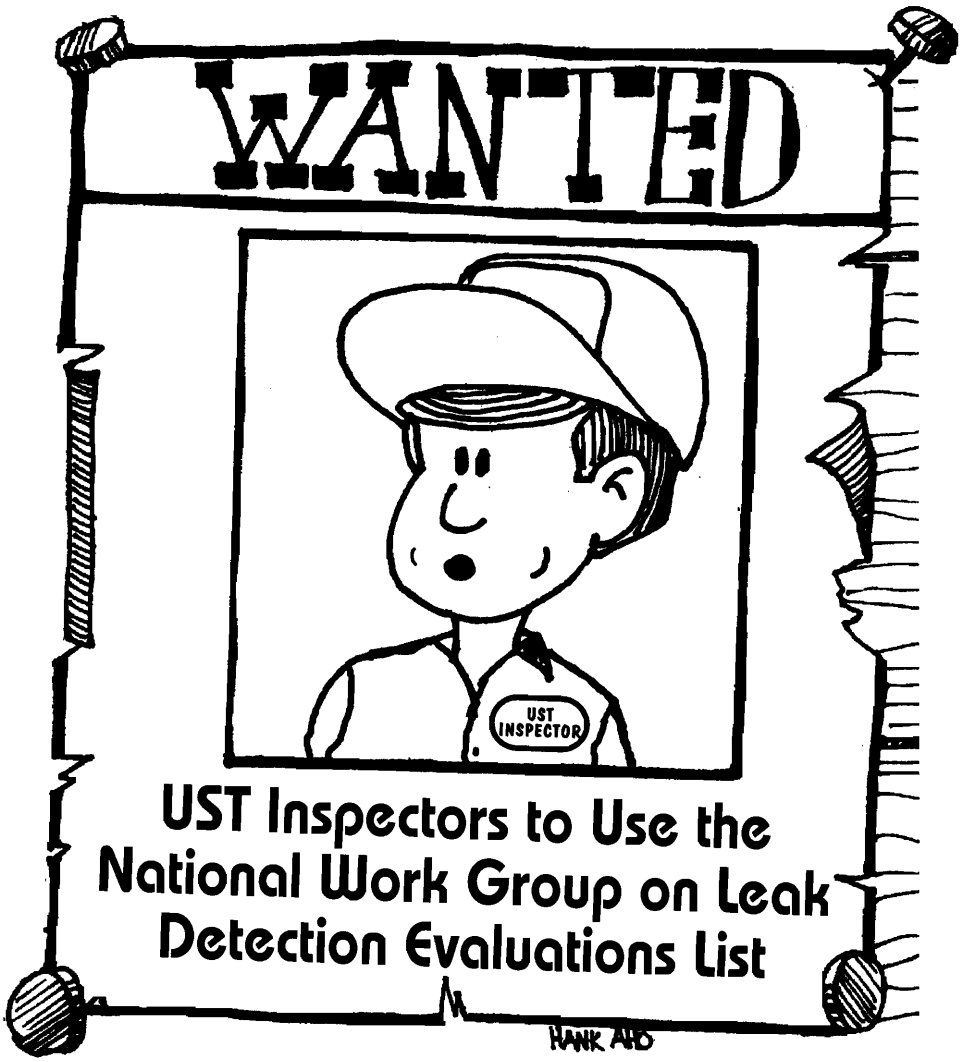
Leak Prevention



by Curt Johnson

As we enter the new millennium and the underground storage tank (UST) program deadlines are all part of the past century, we need to take a fresh look at where we are headed. In the past we worked hard to try to encourage UST owners and operators to install the required leak detection, corrosion protection, and spill and overfill prevention equipment. Now it is time to make sure that owners and operators are using the equipment and using it properly.

Determining whether equipment is being used is fairly straightforward. Determining whether it is being used properly is much more difficult and requires a basic knowledge of the operating principles of the equipment, along with ready access to a comprehensive source of technical information pertaining to the equipment.

When it comes to leak detection equipment, the current National Work Group on Leak Detection Evaluation's (NWGLDE) "List of Leak Detection Evaluations for Underground Storage Tank Systems" can be a valuable resource for UST inspectors. It provides the essential technical information needed to determine whether leak detection equipment is properly applied and operated in the field.

In the past, the NWGLDE List has been promoted primarily as a means for determining whether a certain type of leak detection equipment was properly third-party tested in accordance with an accepted protocol. This publication, however, contains a much broader scope of information that can serve as an important tool for UST inspectors. I am thinking particularly about Part II

■ *continued on page 14*

■ **NWGLDE** *from page 13*

of the publication— "Leak Detection Equipment Specifications"—which provides important tips for making sure that leak detection equipment was installed and is being operated so that it performs according to manufacturer specifications and within EPA UST regulatory performance requirements.

Let me give you a few examples of how UST inspectors can use Part II of the NWGLDE List to check the application and operation of a few methods of leak detection during a compliance inspection.

Automatic Tank Gauging (ATG) Method

The ATG equipment specification sheets have the following 10 categories that provide the UST inspector with information on the correct application and operation of an ATG.

Certification

- As indicated on the NWGLDE List, some tank gauges are certified for two leak rates, 0.1 and 0.2 gph (the others are certified to detect only 0.2 gph leak rates). Make sure that the ATG is set up to test at the appropriate leak rate.
- Because the same ATG can have a different test period and a different waiting time, depending on the leak rate used, confirm that the test period and the waiting time correspond to the appropriate leak rate.

Leak Threshold

- When the leak threshold can be determined, make sure that a leak is being declared when the test results equal or exceed the threshold listed under this category in the NWGLDE List. Remember that the leak threshold is always less than the regulatory standard (0.2 gph). When the measured leak rate exceeds this listed threshold, the test result indicates a suspected release.

Applicability

- Identify the product stored in the tank and make sure that it is listed under this category in the NWGLDE List. Watch out for waste oil tanks. Because properties of used oil are not constant, only mass-based ATG systems are able to test them.

Tank Capacity

- Because different ATGs are limited to different maximum tank sizes, compare the tank volume to the volume listed for maximum tank size. If the volume exceeds the maximum volume listed, then the test results are not acceptable based on the EPA test protocol requirements.
- Check the product level in the tank when the tests are run to make sure that they fall within the acceptable range indicated under this item. The third-party test indicates that test results where the product level is outside this range are not valid.
- As indicated later under the "Comments" category, check for and be concerned about ATG tests that are conducted at consistently low levels.

Waiting Time

- Check the waiting time between delivery and testing, and between dispensing and testing to ensure that the minimum time periods listed under this category are met. If waiting times are shorter than required, then the test results are not acceptable based on the EPA test protocol requirements.

Test Period

- As indicated earlier under "Certification," the test period must correspond to the leak rate. Verify that the tests are being run at least as long as the test period indicated. If the test did not last long enough, then the test results are not acceptable based on the EPA test protocol requirements.

Temperature

- Check the equipment invoice against the manufacturer's probe specifications to determine the number of temperature sensors that are installed on the probe. There must be at least as many indicated under this category in the NWGLDE List to ensure that there are enough in use at all acceptable product test levels. Note: Do not attempt to physically inspect the probe.

Water Sensor

- If a tank gauge stick and water finder paste are available, check the water level and compare this reading against the equipment's water sensor reading. The sensitivity and possible tank tilt (because the stick and gauge are not in the same location) need to be considered when comparing the readings.

Calibration

- Always check records to make sure that the temperature sensors (or thermistors) and probe are being calibrated regularly based on the manufacturer's instructions. Without calibration, this equipment may not detect a leak at the required leak rate or may indicate a leak when none exists.

Comments

The NWGLDE List includes the following comments regarding our group's concerns about the installation and operation of ATGs:

- Check to determine whether and be concerned when an ATG is installed in a manifolded tank system. At present the NWGLDE List shows that none of the ATG systems listed has been evaluated in manifolded tank systems.
- Because ATGs test only the portion of the tank containing product at the time of the test, consistent testing at low product levels should be a concern to inspectors. This situation could allow a leak to go undetected. EPA regulations require testing of the portion of the tank that routinely contains product, which means that the test should be run while the tank is filled as close as possible to its highest level during the month.

Non-volumetric Tank Tightness Test (NVTTT) Method

The NVTTT equipment specification sheets have the following 11 categories that provide the UST inspector with information on proper equipment application and operation.

Certification

- Be aware that the NVTTT is a qualitative method. Thus, the equipment is certified to be able to detect a leak at the listed leak rate, but cannot generate a leak rate during the test.

Leak Threshold

- NVTTT methods use several different ways to determine a leak. One is to put the tank under pressure or vacuum and monitor for loss of either. A second is to put a microphone in the tank, place the tank under vacuum, and listen for bubbles in the area below the product level and the whistling of air in the ullage area. Another is to inject a tracer compound into the tank and monitor for the tracer in the soil outside the tank. For some methods, inspectors will be able to review the test data and verify whether a leak has occurred based on the information in the NWGLDE List. For others, an inspector will only be able to review the data to see whether they look reasonable.

Applicability

- Identify the product stored in the tank using the NVTTT method and make sure that it is listed under this category in the NWGLDE List. Again, watch out for waste oil tanks, because some NVTTT equipment cannot be used for waste oil.

Tank Capacity

- Always check the tank size and/or ullage volume limitations to make sure that it is within the limitations on the NWGLDE List. This step will ensure that the NVTTT will be able to detect a leak at the appropriate leak rate.
- Check the level or volume of the tank, whichever is indicated in the NWGLDE List, when the tests are run to make sure that they fall within acceptable range.

Waiting Time

- Because these methods are independent of temperature, there is usually no waiting time between delivery and testing. However, tests using a tracer do have a waiting time and the inspector needs to ensure that the test complies with the waiting time requirement on the NWGLDE List. If the waiting time is shorter than required, then the test results are not acceptable based on the EPA test protocol requirements.

Test Period

- For tracer tests, the test period is the same as the waiting time. Some NVTTT equipment have very straightforward test periods; others are very complicated. The NWGLDE List normally provides enough information to determine whether the length of the test is sufficient. However, some test periods are dependent on tables that must be obtained from the manufacturer.

Temperature

- As indicated earlier, NVTTT methods are independent of temperature.

Water Sensor

- If you are on-site during a NVTTT vacuum or pressure test and a tank gauge stick and water finder paste are available, check for water in the tank. If water is detected, compare this reading to the equipment's water sensor reading. The sensitivity needs to be considered when comparing the readings.

Groundwater

- All NVTTT methods require that the depth to groundwater within the tank backfill be determined. Always check test records to make sure that the groundwater level was adequately determined and documented. This step is critical for vacuum tests to ensure that the vacuum applied will not collapse the tank. It also provides an opportunity for the tester or the inspector to check for free product. The test should be considered invalid if the tester did not identify and, if necessary, compensate for water in the tank backfill.

Calibration

- Some vendors require the test equipment to be calibrated before each test; others do not. Where applicable, check the operator's records to make sure that the equipment was calibrated.

Comments

Here are some of the issues in this category that should be considered by an inspector:

- For vacuum-type NVTTT equipment used to test older tanks (tanks installed prior to the EPA regulations), it is important for inspectors to determine the type of backfill used around the tanks, because clay backfill may plug the holes in the tank when a vacuum is applied.
- When backfill is saturated with product, vacuum-type NVTT equipment may fail to detect a leak because product, instead of air or water, is drawn into the tank. Inspectors should determine whether monitoring wells within the tank backfill area were checked at the time of the test.

If you would like assistance in determining what to look for during inspections with respect to other types of leak detection equipment, I encourage you to review the NWGLDE List or contact the appropriate NWGLDE member. NWGLDE member phone numbers, fax numbers, e-mail addresses, and business addresses are listed near the front of the NWGLDE List.

In the new millennium, UST inspectors will need to spend more time looking at the operation of leak detection equipment instead of just looking for a box on the wall to confirm that leak detection equipment was installed. The NWGLDE List can be a helpful source of information for UST inspectors performing these inspections. The list can be viewed or downloaded from EPA's Internet home page at *http://www.epa.gov/oust/pubs/index/htm.* ■

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