

Chapter 7 – RELEASE DETECTION REQUIREMENTS**001. GENERAL REQUIREMENTS FOR ALL UST SYSTEMS**

Owners and operators shall conduct and record the daily product inventory control requirements as described in 004.01A-G of this chapter for all new and existing UST systems.

[Exception: UST systems eligible for and utilizing manual tank gauging in accordance with 004.02 of this chapter do not need to meet the daily inventory requirement.]

In addition, owners and operators of new and existing UST systems shall use a method, or combination of methods, of release detection that:

001.01. Can detect a release from any portion of the tank and the connected underground piping that routinely contains product;

001.02. Is installed, calibrated, operated, and maintained in accordance with the manufacturer's instructions, including routine maintenance and service checks for operability or running condition; and

001.03. Meets the performance requirements in 004 or 005 of this chapter, with any performance claims and their manner of determination described in writing by the equipment manufacturer or installer. In addition, methods used after January 1, 1991 except for methods permanently installed prior to that date, must be capable of detecting the leak rate or quantity specified for that method in 004.02, 004.03 and 004.04 or 005.01 and 005.02 of this chapter with a probability of detection of 0.95 and a probability of false alarm of 0.05.

001.04. When a release detection method operated in accordance with the performance standards in 004 and 005 of this chapter indicates a release may have occurred, owners and operators must notify the State Fire Marshal within 24 hours in accordance with 006.01B in Chapter 6.

001.05. Owners and operators of all UST systems must comply with the release detection requirements of this chapter.

001.05A. Any existing UST system that cannot apply a method of release detection that complies with the requirements of this section must complete the permanent closure procedures in Chapter 10.

002. REQUIREMENTS FOR PETROLEUM UST SYSTEMS

Owners and operators of petroleum UST systems must provide release detection for tanks and piping as follows:

002.01. Tanks. Tanks must be monitored at least every 30 days for releases using one of the methods listed in 004.04 through 004.06 below except that:

002.01A. UST systems that meet the performance standards in Chapter 4 or Chapter 5, and the monthly inventory control requirements in 004.01 or 004.02 of this chapter, may use tank precision testing (conducted in accordance with 004.03 below) at least every five (5) years for 10 years after the tank is installed or upgraded under 002 in Chapter 5.

002.01B. UST systems that do not meet the performance standards in Chapter 4 or Chapter 5 must be upgraded under Chapter 5 or permanently closed under 002 in Chapter 10; and

002.01C. Tanks with capacity of 1000 gallons or less may use weekly tank gauging in accordance with 004.02 below.

002.02. Piping. Underground piping that routinely contains regulated substances must be monitored for releases in a manner that meets one of the following requirements:

002.02A. Pressurized piping. Underground piping that conveys regulated substances under pressure must:

002.02A1. Be equipped with an automatic line leak detector conducted in accordance with 005.01 below; and

002.02A2. Have an annual line tightness test conducted in accordance with 005.02 below or have monthly monitoring conducted in accordance with 005.03 below.

002.02B. Suction piping. Underground piping that conveys regulated substances under suction must either have a line tightness test conducted at least every three (3) years and in accordance with 005.02 below, or use a monthly monitoring method conduct in accordance with 005.03 below. No release detection is required for suction piping that is designed and constructed to meet the following standards:

002.02B1. The below-grade piping operates at less than atmospheric pressure;

002.02B2. The below-grade piping is sloped so that the contents of the pipe will drain back into the storage tank if the suction is released;

002.02B3. Only one check valve is included in each suction line;

002.02B4. The check valve is located directly below and as close as practical to the suction pump; and

002.02B5. A method is provided that allows compliance with 002.02B2 - 002.02B4 to be readily determined.

003. REQUIREMENTS FOR HAZARDOUS SUBSTANCE UST SYSTEMS

Owners and operators of hazardous substance UST systems must provide release detection that meets the following requirements:

003.01. Hazardous substance UST systems must meet the release detection requirements for petroleum UST systems in 002 and 004 and the design standards of 003.02.

003.02. Release detection at new hazardous substance UST systems must meet the following requirements:

003.02A. Secondary containment systems must be designed, constructed and installed to:

003.02A1. Contain regulated substances released from the tank system until they are detected and removed;

003.02A2. Prevent the release of regulated substances to the environment at any time during the operational life of the UST system; and

003.02A3. Be checked for evidence of a release at least every 30 days.

[*Note:* The provisions of 40 CFR 265.193, Containment and Detection of Releases, may be used to comply with these requirements.]

003.02B. Double-walled tanks must be designed, constructed, and installed to:

003.02B1. Contain a release from any portion of the inner tank within the outer wall; and

003.02B2. Detect the failure of the inner wall.

003.02C. External liners (including vaults) must be designed, constructed, and installed to:

003.02C1. Contain 100 percent of the capacity of the largest tank within its boundary;

003.02C2. Prevent the interference of precipitation or ground-water intrusion with the ability to contain or detect a release of regulated substances; and

003.02C3. Surround the tank completely (i.e., it is capable of preventing lateral as well as vertical migration of regulated substances).

003.02D. Underground piping must be equipped with secondary containment that satisfies the requirements of 003.02A above (e.g., trench liners, jacketing of double-walled pipe). In addition, underground piping that conveys regulated substances under pressure must be equipped with an automatic line leak detector in accordance with 005.01 below.

003.02E. Other methods of release detection may be used if owners and operators:

003.02E1. Demonstrate to the State Fire Marshal that an alternate method can detect a release of the stored substance as effectively as any of the methods allowed in 004.02 - 004.06 below can detect a release of petroleum;

003.02E2. Provide information to the State Fire Marshal on effective corrective action technologies, health risks, and chemical and physical properties of the stored substance, and the characteristics of the UST site; and,

003.02E3. Obtain approval from the State Fire Marshal to use the alternate release detection method before the installation and operation of the new UST system.

004. METHODS OF RELEASE DETECTION FOR TANKS.

Each method of release detection for tanks used to meet the requirements of 002 above must be conducted in accordance with the following:

004.01. Inventory control. A daily product inventory control system (or another test of equivalent performance) must be utilized which is capable of detecting a release of at least 1.0 percent of flow-through plus 130 gallons on a monthly basis in the following manner:

004.01A. Inventory volume measurements for regulated substance inputs, withdrawals, and the amount still remaining in the tank shall be recorded each operating day;

004.01B. The equipment used must be capable of measuring the level of product over the full range of the tank's height to the nearest one-eighth of an inch;

004.01C. The regulated substance inputs shall be reconciled with delivery receipts by measurement of the tank inventory volume before and after delivery;

004.01D. Deliveries shall be made through a drop tube that extends to within six inches of the tank bottom;

004.01E. Product dispensing shall be metered and recorded within the local standards for meter calibration or an accuracy of six (6) cubic inches for every five (5) gallons of product withdrawn; and

004.01F. The measurement of any water level in the bottom of the tank shall be made to the nearest one-eighth of an inch at least once a month.

004.01G. Inventory shall be reconciled on a monthly basis and reconciled records shall be retained for five years.

[*Note:* Practices described in the American Petroleum Institute Publication 1621, "Recommended Practice for Bulk Liquid Stock Control at Retail Outlets," may be used, where applicable, as guidance in meeting the requirements of this section.]

004.02. Manual tank gauging. Manual tank gauging must meet the following requirements:

004.02A. Tank liquid level measurements shall be taken at the beginning and ending of a period of time during which no liquid is added to or removed from the tank;

004.02B. Level measurements shall be based on the average of two consecutive stick readings at both the beginning and ending of the period;

004.02C. The measurement of any water level in the bottom of the tank shall be made to the nearest one-eighth of an inch at least once a month.

004.02D. The equipment used shall be capable of measuring the level of product over the full range of the tank’s height to the nearest one-eighth of an inch.

004.02E. If the variation between beginning and ending measurements exceeds the weekly or monthly standards in the following table, a leak is suspected and the tank is subject to the requirements of 006.01B of Chapter 6:

<u>Nominal Tank Capacity & Dimensions</u>	<u>Weekly Standard (one test)</u>	<u>Monthly Standard (average of four tests)</u>	<u>Minimum Test Duration</u>
550 gallons or less	10 gallons	5 gallons	36 hours
551-999 gallons	13 gallons	7 gallons	36 hours
1,000 gallons (64" x 73")	9 gallons	4 gallons	44 hours
1,000 gallons (48" x 128")	12 gallons	6 gallons	58 hours
1,001-2,000 gallons	26 gallons	13 gallons	36 hours

004.02F. Tanks of 1,000 gallons or less nominal capacity may use this as the sole method of release detection. Tanks of 2,000 gallons or less may use this method in place of daily inventory control in 004.01 above in combination with tank tightness testing requirements in 002 of this chapter. Tanks of more than 2,000

gallons nominal capacity may not use this method to meet the requirements of this section.

004.03. Tank tightness testing. Tank tightness testing (or another test of equivalent performance) must be capable of detecting a 0.1 gallon per hour leak rate with a probability of detection of 95% and a probability of false alarm no more than 5%. Tank tightness tests must be performed when the tank is at least 95% full, while accounting for the effects of thermal expansion or contraction of the product, vapor pockets, tank deformation, evaporation or condensation, and the location of the water table.

004.03A. The tank tightness test shall be conducted in accordance with a code or standard of practice developed by a nationally recognized association or independent testing laboratory.

004.03B. The tank tightness test shall be performed by qualified personnel who possess the requisite training, experience and competence to conduct the test properly, who are present at the facility and who maintain responsible oversight throughout the entire testing procedure, and who have been certified by the manufacturer or developer of the testing equipment as being qualified to perform the test. The tank precision test shall be conducted in strict accordance with the testing procedures developed by the system manufacturer or developer.

004.04. Automatic tank gauging. Equipment for automatic tank gauging that tests for the loss of product and conducts inventory control must meet the following requirements:

004.04A. The automatic product level monitor test must be able to detect a 0.2 gallon per hour leak rate from any portion of the tank that routinely contains product; and

004.04B. Inventory control (or another test of equivalent performance) shall be conducted in accordance with the requirements of 004.01 above.

004.05. Interstitial monitoring. Interstitial monitoring between the UST system and a secondary barrier immediately around or beneath it may only be used if the system is designed, constructed and installed to detect a leak from any portion of the tank that routinely contains product and also meets one of the following requirements:

004.05A. For double-walled UST systems, the sampling or testing method must be able to detect a release through the inner wall in any portion of the tank that routinely contains product.

[*Note:* The provisions outlined in the Steel Tank Institute’s “Standard for Dual Wall Underground Storage Tanks” may be used as guidance for aspects of the design and construction of underground steel double-walled tanks.]

004.05B. For UST systems with a secondary barrier within the excavation zone, the sampling or testing method used must be able to detect a release between the UST system and the secondary barrier.

004.05B1. The secondary barrier around or beneath the UST system shall consist of artificially constructed material that is sufficiently thick and impermeable (at least 10^{-6} cm/sec for the regulated substance stored) to direct a release to the monitoring point and permit its detection.

004.05B2. The barrier must be compatible with the regulated substance stored so that a release from the UST system will not cause a deterioration of the barrier allowing a release to pass through undetected.

004.05B3. For cathodically protected tanks, the secondary barrier must be installed so that it does not interfere with the proper operation of the cathodic protection system.

004.05B4. The ground water, soil moisture, or rainfall must not render the testing or sampling method used inoperative so that a release could go undetected for more than 30 days.

004.05B5. The site must be assessed to ensure that the secondary barrier is always above the ground water and not in a 25-year flood plain, unless the barrier and monitoring designs are for use under such conditions.

004.05B6. Monitoring wells must be clearly marked and secured to avoid unauthorized access and tampering.

004.05C. For tanks with an internally fitted liner, an automated device must be able to detect a release between the inner wall of the tank and the liner, and the liner must be compatible with the substance stored.

004.06. Other methods. An alternative method of release detection, or a combination of methods, may be used if:

004.06A. It can detect a 0.2 gallon per hour leak rate or a release of 150 gallons within a month with a probability of detection of 0.95 and a probability of false alarm of 0.05; or

004.06B. The State Fire Marshal may accept another method if the owner and operator can demonstrate that the method can detect a release at least as effectively as any of the methods allowed in 004.03-004.05 of this chapter. If the method is accepted, the owner and operator must comply with any conditions imposed by the State Fire Marshal on its use to ensure the protection of human health and the environment.

005. METHODS OF RELEASE DETECTION FOR PIPING

Each method of release detection for piping used to meet the requirements of 002 above must be conducted in accordance with the following:

005.01. Automatic line leak detectors. Methods which alert the operator to the presence of a leak by restricting or shutting off the flow of regulated substances through piping or triggering an audible or visual alarm may be used only if they detect leaks of three (3) gallons per hour at 10 pounds per square inch line pressure within one (1) hour. An annual test of the operation of the leak detector must be conducted in accordance with the manufacturer's specifications.

005.02. Line tightness testing. A periodic test of piping may be conducted only if it can detect a 0.1 gallon per hour leak rate at one and one-half times the operating pressure.

005.03. Applicable tank methods. The methods in 004.05 of this chapter may be used if designed to detect a release from any portion of the underground piping that routinely contains regulated substances.

006. RELEASE DETECTION RECORD-KEEPING

All UST system owners and operators must maintain records in accordance with 006 in Chapter 6 demonstrating compliance with all applicable requirements of this chapter. The records must include the following:

006.01. All written performance claims pertaining to any release detection system used, and the manner in which these claims have been justified or tested by the equipment manufacturer or installer, must be

maintained for five (5) years, or for another reasonable period of time determined by the State Fire Marshal, from the date of installation.

006.02. The results of any sampling, testing, or monitoring must be maintained for at least five (5) years, except that the results of tank tightness testing conducted in accordance with 004.03 of this chapter must be retained until the next test is conducted.

006.03. Written documentation of all calibration, maintenance, and repair of release detection equipment permanently located on-site must be maintained for at least one year after the servicing work is completed, or for another reasonable time period determined by the State Fire Marshal. Any schedules of required calibration and maintenance provided by the release detection equipment manufacturer must be retained for five (5) years from the date of installation.

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