



ARIZONA CORPORATION COMMISSION
Powering Arizona's Future

2018 Natural Gas and Hazardous Liquids Pipeline Safety Seminar

Breakout Tanks

- ▣ *Breakout tank* means a tank used to (a) relieve surges in a hazardous liquid pipeline system or (b) receive and store hazardous liquid transported by a pipeline for reinjection and continued transportation by pipeline.

49 CFR §195.132 Design and Construction

- ▣ (a) Each aboveground breakout tank must be designed and constructed to withstand the internal pressure produced by the hazardous liquid to be stored therein and any anticipated external loads.
- ▣ (b) For aboveground breakout tanks first placed in service after October 2, 2000, compliance with paragraph (a) of this section requires one of the following:

49 CFR §195.132 Design and Construction

- ▣ (1) Shop-fabricated, vertical, cylindrical, closed top, welded steel tanks with nominal capacities of 90 to 750 barrels (14.3 to 119.2 m³) and with internal vapor space pressures that are approximately atmospheric must be designed and constructed in accordance with API Spec 12F .
- ▣ (2) Welded, low-pressure (i.e., internal vapor space pressure not greater than 15 psig (103.4 kPa)), carbon steel tanks that have wall shapes that can be generated by a single vertical axis of revolution must be designed and constructed in accordance with API Std 620

49 CFR §195.132 Design and Construction

- ▣ (3) Vertical, cylindrical, welded steel tanks with internal pressures at the tank top approximating atmospheric pressures (i.e., internal vapor space pressures not greater than 2.5 psig (17.2 kPa), or not greater than the pressure developed by the weight of the tank roof) must be designed and constructed in accordance with API Std 650
- ▣ (4) High pressure steel tanks (i.e., internal gas or vapor space pressures greater than 15 psig (103.4 kPa)) with a nominal capacity of 2000 gallons (7571 liters) or more of liquefied petroleum gas (LPG) must be designed and constructed in accordance with API Std 2510

49 CFR §195.205 Repair, alteration and reconstruction of aboveground breakout tanks that have been in service.

- ▣ (a) Aboveground breakout tanks that have been repaired, altered, or reconstructed and returned to service must be capable of withstanding the internal pressure produced by the hazardous liquid to be stored therein and any anticipated external loads.

49 CFR §195.205 Repair, alteration and reconstruction

- ▣ (b) After October 2, 2000, compliance with paragraph (a) of this section requires the following:
 - ▣ (1) For tanks designed for approximate atmospheric pressure, constructed of carbon and low alloy steel, welded or riveted, and non-refrigerated; and for tanks built to API Std 650 or its predecessor Standard 12C; repair, alteration; and reconstruction must be in accordance with API Std 653 (except section 6.4.3)

49 CFR §195.205 Repair, alteration and reconstruction

- ▣ (2) For tanks built to API Spec 12F or API Std 620, repair, alteration, and reconstruction must be in accordance with the design, welding, examination, and material requirements of those respective standards.
- ▣ (3) For high-pressure tanks built to API Std 2510, repairs, alterations, and reconstruction must be in accordance with API Std 510

49 CFR §195.264 Impoundment, protection against entry, normal/emergency venting or pressure/vacuum relief for aboveground breakout tanks

- ▣ (a) A means must be provided for containing hazardous liquids in the event of spillage or failure of an aboveground breakout tank.
- ▣ (b) After October 2, 2000, compliance with paragraph (a) of this section requires the following for the aboveground breakout tanks specified:

49 CFR §195.264

- ▣ (1) For tanks built to API Spec 12F, API Std 620, and others (such as API Std 650 (or its predecessor Standard 12C)), the installation of impoundment must be in accordance with the following sections of NFPA-30;
 - (i) Impoundment around a breakout tank must be installed in accordance with section 22.11.2; and
 - (ii) Impoundment by drainage to a remote impounding area must be installed in accordance with section 22.11.1.

49 CFR §195.264

- ▣ (2) For tanks built to API Std 2510 , the installation of impoundment must be in accordance with section 5 or 11 of API Std 2510.

49 CFR §195.264

- ▣ (c) Aboveground breakout tank areas must be adequately protected against unauthorized entry.
- ▣ (d) Normal/emergency relief venting must be provided for each atmospheric pressure breakout tank. Pressure/vacuum-relieving devices must be provided for each low-pressure and high-pressure breakout tank.

49 CFR §195.264

- ▣ (e) For normal/emergency relief venting and pressure/vacuum-relieving devices installed on aboveground breakout tanks after October 2, 2000, compliance with paragraph (d) of this section requires the following for the tanks specified:
 - (1) Normal/emergency relief venting installed on atmospheric pressure tanks built to API Spec 12F must be in accordance with section 4 and Appendices B and C of API Spec 12F.
 - (2) Normal/emergency relief venting installed on atmospheric pressure tanks (such as those built to API Std 650 or its predecessor Standard 12C) must be in accordance with API Std 2000

49 CFR §195.264

- ▣ (3) Pressure-relieving and emergency vacuum-relieving devices installed on low-pressure tanks built to API Std 620 must be in accordance with Section 9 of API Std 620 and its references to the normal and emergency venting requirements in API Std 2000.
- ▣ (4) Pressure and vacuum-relieving devices installed on high-pressure tanks built to API Std 2510 must be in accordance with sections 7 or 11 of API Std 2510.

49 CFR §195.307 Pressure testing aboveground breakout tanks.

- ▣ (a) For aboveground breakout tanks built to API Spec 12F and first placed in service after October 2, 2000, pneumatic testing must be performed in accordance with section 5.3 of API Spec 12 F.

49 CFR §195.307

- ▣ (b) For aboveground breakout tanks built to API Std 620 and first placed in service after October 2, 2000, hydrostatic and pneumatic testing must be performed in accordance with section 7.18 of API Std 620.
- ▣ (c) For aboveground breakout tanks built to API Std 650 and first placed in service after October 2, 2000, testing must be in accordance with sections 7.3.5 and 7.3.6 of API Standard 650

49 CFR §195.307

- ▣ (d) For aboveground atmospheric pressure breakout tanks constructed of carbon and low alloy steel, welded or riveted, and non-refrigerated tanks built to API Std 650 or its predecessor Standard 12 C that are returned to service after October 2, 2000, the necessity for the hydrostatic testing of repair, alteration, and reconstruction is covered in section 12.3 of API Standard 653.
- ▣ (e) For aboveground breakout tanks built to API Std 2510 and first placed in service after October 2, 2000, pressure testing must be performed in accordance with 2007 ASME Boiler and Pressure Vessel Code (BPVC) (Section VIII, Division 1 or 2).

49 CFR §195.428 Overpressure safety devices and overfill protection systems

- ▣ (a) Except as provided in paragraph (b) of this section, each operator shall, at intervals not exceeding 15 months, but at least once each calendar year, or in the case of pipelines used to carry highly volatile liquids, at intervals not to exceed 7½ months, but at least twice each calendar year, inspect and test each *pressure limiting device, relief valve, pressure regulator, or other item of pressure control equipment* to determine that it is functioning properly, is in good mechanical condition, and is adequate from the standpoint of capacity and reliability of operation for the service in which it is used.

49 CFR §195.428

- ▣ (b) In the case of relief valves on pressure breakout tanks containing highly volatile liquids, each operator shall test each valve at intervals not exceeding 5 years.

49 CFR §195.428

- ▣ (c) Aboveground breakout tanks that are constructed or significantly altered according to API Std 2510 after October 2, 2000, must have an overfill protection system installed according to API Std 2510, section 7.1.2. Other aboveground breakout tanks with 600 gallons (2271 liters) or more of storage capacity that are constructed or significantly altered after October 2, 2000, must have an overfill protection system installed according to API RP 2350. However, an operator need not comply with any part of API RP 2350 for a particular breakout tank if the operator describes in the manual required by §195.402 why compliance with that part is not necessary for **the safety of the tank**.

49 CFR §195.428

- ▣ (d) After October 2, 2000, the requirements of paragraphs (a) and (b) of this section for inspection and testing of pressure control equipment apply to the inspection and testing of overfill protection systems.

49 CFR §195.432 Inspection of in-service breakout tanks.

- ▣ (a) Except for breakout tanks inspected under paragraphs (b) and (c) of this section, each operator shall, at intervals not exceeding 15 months, but at least once each calendar year, inspect each in-service breakout tank.

49 CFR §195.432

- ▣ (b) Each operator must inspect the physical integrity of in-service atmospheric and low-pressure steel above-ground breakout tanks according to API Std 653 (except section 6.4.3, Alternative Internal Inspection Interval). However, if structural conditions prevent access to the tank bottom, its integrity may be assessed according to a plan included in the operations and maintenance manual under §195.402(c)(3). The risk-based internal inspection procedures in API Std 653, section 6.4.3 cannot be used to determine the internal inspection interval.

49 CFR §195.432

- ▣ (1) Operators who established internal inspection intervals based on risk-based inspection procedures prior to March 6, 2015 must re-establish internal inspection intervals based on API Std 653, section 6.4.2.
- ▣ (i) If the internal inspection interval was determined by the prior risk-based inspection procedure using API Std 653, section 6.4.3 and the resulting calculation exceeded 20 years, and it has been more than 20 years since an internal inspection was performed, the operator must complete a new internal inspection in accordance with §195.432(b)(1) by January 5, 2017.

49 CFR §195.432

- ▣ (ii) If the internal inspection interval was determined by the prior risk-based inspection procedure using API Std 653, section 6.4.3 and the resulting calculation was less than or equal to 20 years, and the time since the most recent internal inspection exceeds the re-established inspection interval in accordance with §195.432(b)(1), the operator must complete a new internal inspection by January 5, 2017.

49 CFR §195.432

- ▣ (iii) If the internal inspection interval was not based upon current engineering and operational information (i.e., actual corrosion rate of floor plates, actual remaining thickness of the floor plates, etc.), the operator must complete a new internal inspection by January 5, 2017 and re-establish a new internal inspection interval in accordance with §195.432(b)(1).

49 CFR §195.432

- ▣ (c) Each operator must inspect the physical integrity of in-service steel aboveground breakout tanks built to API Std 2510 according to section 6 of API Std 510.

- ▣ (d) The intervals of inspection specified by documents referenced in paragraphs (b) and (c) of this section begin on May 3, 1999, or on the operator's last recorded date of the inspection, whichever is earlier.

49 CFR §195.565 How do I install cathodic protection on breakout tanks?

- ▣ After October 2, 2000, when you install cathodic protection under §195.563(a) to protect the bottom of an aboveground breakout tank of more than 500 barrels 79.49m³ capacity built to API Spec 12F, API Std 620, API Std 650, or API Std 650's predecessor, Standard 12C, you must install the system in accordance with ANSI/API RP 651. However, you don't need to comply with ANSI/API RP 651 when installing any tank for which you note in the corrosion control procedures established under §195.402(c)(3) why complying with all or certain provisions of ANSI/API RP 651 is not necessary for the safety of the tank.

49 CFR §195.573 What must I do to monitor external corrosion control?

- ▣ (d) Breakout tanks. You must inspect each cathodic protection system used to control corrosion on the bottom of an aboveground breakout tank to ensure that operation and maintenance of the system are in accordance with API RP 651. However, this inspection is not required if you note in the corrosion control procedures established under §195.402(c)(3) why complying with all or certain operation and maintenance provisions of API RP 651 is not necessary for the safety of the tank.

49 CFR §195.579 What must I do to mitigate internal corrosion?

- ▣ (d) Breakout tanks. After October 2, 2000, when you install a tank bottom lining in an aboveground breakout tank built to API Spec 12F, API Std 620, API Std 650, or API Std 650's predecessor, Standard 12C, you must install the lining in accordance with API RP 652. However, you don't need to comply with API RP 652 when installing any tank for which you note in the corrosion control procedures established under §195.402(c)(3) why compliance with all or certain provisions of API RP 652 is not necessary for the safety of the tank.