CHAPTER 14. VAULTS FOR THE STORAGE OF FLAMMABLE AND COMBUSTIBLE LIQUIDS—STATEMENT OF POLICY

Sec.

Authority

The provisions of this Chapter 14 issued under section 1 of the act of April 27, 1927 (P. L. 450, No. 291) (35 P. S. § 1181), unless otherwise noted.

Source

The provisions of this Chapter 14 adopted October 29, 1993, effective October 30, 1993, 23 Pa.B. 5137, unless otherwise noted.

§ 14.1. Installation of vaults for the storage of flammable and combustible liquids.

The State Police Fire Marshal may permit the installation of vaults for storing flammable and combustible liquids for retail and nonretail distribution if the minimum standards in §§ 14.2—14.6 are met.

§ 14.2. Physical requirements of vaults.

(a) Vaults for retail distribution shall be constructed below grade. Vaults for nonretail distribution may be constructed either above or below grade.

(b) The vault shall completely enclose each tank. There may not be openings in the vault enclosure except those necessary for access to, inspection of, and filling, emptying and venting of the tank. The walls and floor of the vault shall be constructed of reinforced concrete at least 6 inches thick. The top of an above grade vault shall be constructed of noncombustible material constructed to be weaker than the walls to assure that in the event of an explosion inside the vault, the thrust of the explosion will be inside the vault. The top, floor and tank foundation shall be designed to withstand the anticipated loading. The walls and floor of a vault installed below grade shall be designed to withstand anticipated soil and hydrostatic loading. The vault shall be substantially liquid tight and there may be no backfill around the tank. There shall be sufficient space between the tank and the vault to allow for inspection of the tank and appurtenances.

(c) Each vault and its tank shall be suitably anchored to withstand uplifting by groundwater or flooding, including when the tank is empty.

(d) The vault shall be designed to be wind and earthquake resistant, in accordance with sound engineering practice. The vault shall be resistant to damage from the impact of a motor vehicle, or suitable collision barriers shall be provided.

(e) Each tank shall be in its own vault. Adjacent vaults may share a common wall if the top of each vault is constructed to conform to the requirements of subsection (b). The top of each vault shall be constructed of noncombustible material constructed to be weaker than the walls to assure that in the event of an explosion inside the vault, the thrust of the explosion will be directed upward before a significantly high pressure can develop inside the vault.

(f) Connections shall be provided to permit venting of each vault to dilute, disperse and remove vapors prior to personnel entering the vault.

(g) Vaults shall be provided with continuous ventilation at a rate of not less than 1 cubic foot per minute per square foot of floor area, but not less than 150 cubic feet per minute. Failure of the exhaust air flow shall automatically shut down the dispensing system. The exhaust system shall be designed to provide air movement across all parts of the vault floor. Supply and exhaust ducts shall extend to within 3 inches, but not more than 12 inches of the floor. The exhaust system shall be installed in accordance with NFPA 91, Standard For Exhaust Systems For Air Conveying of Materials. A means shall be provided to automatically detect flammable vapors and to automatically shut down the dispensing system upon detection of the flammable vapors in the exhaust duct at a concentration of 25% of the lower flammable limit.

(h) Each vault shall be equipped with a detection system capable of detecting liquids, including water, and of activating an alarm upon detection.

(i) A means to recover liquid from the vault shall be provided. If a pump is used to meet this requirement, the pump may not be permanently installed in the vault. Electric powered portable pumps used to recover liquid shall be suitable for use in Class I, Division I locations, as defined in NFPA 70, National Electric Code.

(j) Vent pipes that are provided for normal tank venting shall extend at least 12 feet above ground level.

(k) Emergency vents shall be vapor tight and shall be permitted to discharge inside the vault. Long-bolt manhole covers will not be permitted for this purpose.

(l) Each vault shall be provided with a means for personnel entry. At each entry point, a warning sign indicating the need for procedures for safe entry into confined spaces shall be posted. Employees and other persons who anticipate entering the vault shall be made aware of and each entry shall conform to applicable Federal regulations regarding confined space entry. Each entry point shall be secured against unauthorized entry and vandalism.

(m) Each vault shall be provided with a suitable means to admit a fire suppression agent. The connection shall be at least 25 feet from the nearest wall of the vault and shall be compatible with standard couplings used by fire departments in that area.

(n) The interior of a vault shall be designated a Class I, Division I location as defined in NFPA 70, National Electric Code.

(o) Each vault shall be equipped with adequate lighting. The lighting shall be explosion proof and conform with NFPA 70, National Electric Code.

(p) Tanks within vaults shall be approved for aboveground use and shall have been tested in accordance with UL 142, Standard for Steel Aboveground Tanks For Flammable Or Combustible Liquids, or an equivalent test procedure. Individual tanks shall be limited to a maximum capacity of 12,000 gallons.

(q) Tanks within above grade vaults shall be at least 25 feet from buildings on the same property, 25 feet from the nearest side of a public way and 50 feet from a property line that may be built upon. Tanks within below grade vaults shall be at least 5 feet from buildings on the same property, 5 feet from the nearest side of a public way and 5 feet from property lines.

Cross References

This section cited in 37 Pa. Code § 14.1 (relating to installation of vaults for the storage of flammable and combustible liquids).

§ 14.3. Piping and ancillary equipment.

(a) A means for determining the liquid level in each tank shall be provided and this means shall be accessible to the delivery operator. A means to sound an audible alarm when the liquid level in the tank reaches 90% of capacity shall be provided. A means either to automatically stop the flow of liquid into the tank when the liquid level in the tank reaches 98% of capacity or to restrict the flow of liquid into the tank to a maximum 2.5 gpm when the liquid in the tank reaches 95% capacity shall also be provided. These provisions may not restrict or interfere with the proper operation of either the normal vent or the emergency vent.

(b) Fuel may not be dispensed from the tank by either gravity flow or pressurization of the tank. A means to prevent the release of liquid by siphon flow shall be provided.

(c) If the tank is at an elevation that produces a gravity head on the dispensing device, the tank outlet shall be equipped with a device that will prevent gravity flow from the tank to the dispenser, such as a normally closed solenoid valve. This device shall be located adjacent to and downstream of the outlet valve specified by 2-3.8.1 of NFPA 30, Flammable and Combustible Liquids Code. The device shall be installed and adjusted so that liquid cannot flow by gravity from the tank to the dispenser in the event of failure of the piping or hose when the dispenser is not in use.

(d) If a submersible pump system is used, a listed emergency shutoff valve shall be installed, as required by 4-3.6 of NFPA 30A, Automotive and Marine Service Station Code.

(e) If a suction pump-type dispensing device is used, a listed, vacuum-actuated shutoff valve, with a shear section, or equivalent-type valve shall be installed directly under each dispensing device. Tanks installed in below grade vaults are not required to comply with this section.

(f) Shutoff and check valves shall be equipped with a pressure-relieving device that will relieve the pressure generated by thermal expansion back to the tank.

(g) Piping shall be routed so that exposure to physical damage is minimized.

Cross References

This section cited in 37 Pa. Code § 14.1 (relating to installation of vaults for the storage of flammable and combustible liquids).

§ 14.4. Corrosion protection.

Any portion of a tank or its piping system that is in contact with the soil shall be protected from corrosion in accordance with sound engineering practice.

Cross References

This section cited in 37 Pa. Code § 14.1 (relating to installation of vaults for the storage of flammable and combustible liquids).

§ 14.5. Tank filling operations.

Delivery operations shall comply with NFPA 385, Standard For Tank Vehicles For Flammable And Combustible Liquids, as well as the following requirements:

(1) The delivery vehicle shall be separated from an aboveground tank by at least 25 feet, except that no minimum separation distance is required for tanks that are filled by gravity.

(2) Tank filling may not begin until the delivery operator has determined tank ullage—available capacity.

(3) Tanks shall be filled through a liquid-tight connection. If the tank is filled by means of fixed piping, either a check valve and shutoff valve with a quick-connect coupling or a check valve with a dry-break coupling shall be installed in the piping where connection and disconnection is made between the tank and the delivery vehicle. This device shall be protected from tampering and physical damage.

Cross References

This section cited in 37 Pa. Code § 14.1 (relating to installation of vaults for the storage of flammable and combustible liquids).

§ 14.6. Installation and use of aboveground tanks for storage and dispensing of Class I and Class II motor fuels.

The Pennsylvania State Police Fire Marshal may permit a maximum storage of 12,000 gallons of Class I and 12,000 gallons of Class II motor fuels aboveground for nonretail distribution. Until revisions to this subpart are accomplished, the following requirements shall be met to obtain a fire/explosion safety approval. Each application is reviewed on a site specific basis and additional provisions may be applied.

(1) Tanks storing Class I motor fuel for dispensing into registered motor vehicles shall have a minimum 2-hour fire rating as described in UL 2085, Outline Of Investigation For Insulated Aboveground Tanks For Flammable and Combustible Liquids, or equivalent test procedure.

(2) The tank shall be located at least 50 feet from buildings and 100 feet from property lines; except that if a 2-hour fire rated tank is utilized, the site distances may be reduced by half.

(3) Bollards shall be installed to protect against collision. Six-inch steel pipes filled with concrete, 3 feet in ground, 4 feet high, 4 feet apart and at least 2 feet from the shell of the tank shall be used. Barriers providing equal or greater protection will be acceptable with the approval of the Pennsylvania State Police Fire Marshal.

(4) Secondary containment capable of handling 110% of the capacity of the tank shall be provided.

(5) A clearly labeled emergency power disconnect switch shall be located not less than 20 nor more than 100 feet from the fuel dispenser.

(6) Warning signs stating ''NO SMOKING'' and ''STOP MOTOR'' shall be conspicuously posted in the dispensing area.

(7) Each tank shall be properly placarded to identify its contents and have a ''NO SMOKING'' sign displayed.

(8) The tank shall be set on a suitable foundation constructed in conformance with the tank manufacturers recommendations and using good engineering practices.

(9) A suitable fire extinguisher of at least 20 B:C rating shall be accessible. Depending on the type and amount of fuel stored, additional fire extinguishment measures may be required.

(10) Suitable security measures including, fencing or lighting, may be required, if deemed necessary under the circumstances to prevent tampering or vandalism.

Cross References

This section cited in 37 Pa. Code § 14.1 (relating to installation of vaults for the storage of flammable and combustible liquids).

§ 14.7. Dispensing of Class I and Class II liquids from tank vehicles.

Section 13.105(f) (relating to loading and unloading) does not prohibit the dispensing of Class I and Class II liquids in the open from a tank vehicle to motor vehicles located at commercial, industrial, governmental or manufacturing establishments and which are intended for fueling vehicles used in connection with their business. The tank vehicle and operation shall be conducted in compliance with Federal and State Departments of Transportation regulations. Approval is not required for operations under this section.

§ 14.8. Fuel tanks for heating and power devices.

Section 13.161(b) (relating to general provisions) does not require approval for tanks supplying fuel to heating or power devices where the capacity of an individual tank does not exceed 3,000 gallons.

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