

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

Attachment No. 1

Page 1 of 5

PROPOSED STATE STANDARD,
TITLE 8, DIVISION 1, CHAPTER 4

Amend Section 5605 to read:

§5605. Protection of Tanks in Locations That May Be Flooded.

(a) Where an underground or above ground storage tank is located in an area that may be subjected to flooding, installation shall be in accordance with the provisions of NFPA No. 30-4973-2012, Chapter 21, Section 21.7.3, Chapter 22, Section 22.5.2.5, and Section 22.14, Chapter 23, Section 23.14, and Annex A.23.14.1, which are hereby incorporated by reference.

(b) In addition to the requirements of subsection (a), the following requirements apply when an underground or above ground storage tank is located in a flood area (i.e., an area prone to flooding):

(1) No above ground vertical storage tank containing a flammable or combustible liquid shall be located so that the allowable liquid level within the tank is below the established maximum flood stage, unless the tank is provided with a guiding structure such as described in subsections (b) (12), (13), and (14) of this section.

(2) Independent water supply facilities shall be provided at locations where there is no ample and dependable public water supply available for loading partially empty tanks with water.

(3) In addition to the preceding requirements, each tank so located that more than 70 percent, but less than 100 percent, of its allowable liquid storage capacity will be submerged at the established maximum flood stage, shall be safeguarded as follows:

(A) The tank shall be raised, or its height shall be increased, until its top extends above the maximum flood stage a distance equivalent to 30 percent or more of its allowable liquid storage capacity provided the submerged part of the tank shall not exceed two and one-half times the diameter.

(B) As an alternative to (A), adequate noncombustible structural guides, designed to permit the tank to float vertically without loss of product, shall be provided.

(4) Horizontal tanks that are located where more than 70 percent of the tank's storage capacity will be submerged at the established flood stage shall be secured by one of the following methods:

(A) Anchored to resist movement.

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

Attachment No. 1

Page 2 of 5

PROPOSED STATE STANDARD,
TITLE 8, DIVISION 1, CHAPTER 4

(B) Attached to a foundation of steel and concrete or of concrete having sufficient weight to provide load for the tank when filled with liquid and submerged by floodwater to established flood stage.

(C) Secured from floating by other means.

(5) At locations where there is no ample and dependable water supply, or where filling of underground tanks with liquids is impracticable because of the character of their contents, their use, or for other reasons, each tank shall be safeguarded against movement when empty and submerged by high ground water or floodwaters by anchoring, weighting with concrete or other approved solid loading material, or each tank shall be secured by other means. Each such tank shall be so constructed and installed that it will safely resist external pressures due to high ground water or floodwaters.

(6) At locations where there is an ample and dependable water supply available, underground tanks containing flammable or combustible liquids, so installed that more than 70 percent of their storage capacity will be submerged at the maximum flood stage, shall be so anchored, weighted, or secured by other means, as to prevent movement of such tanks when filled with flammable or combustible liquids and submerged by floodwaters to the established flood stage.

(7) Pipe connections below the allowable liquid level in a tank shall be provided with valves or cocks located as closely as practicable to the tank shell. Such valves and their connections to tanks shall be of steel or other material suitable for use with the liquid being stored. Cast iron shall not be permitted.

(8) At locations where an independent water supply is required, it shall be entirely independent of public power and water supply. An independent source of water shall be available when floodwaters reach a level not less than 10 feet below the bottom of the lowest tank on a property.

(9) The self-contained power and pumping unit shall be so located or so designed that pumping into tanks may be carried on continuously throughout the rise in floodwaters from a level 10 feet below the lowest tank to the level of the potential flood stage.

(10) The capacity of the pumping unit shall be such that the rate of rise of water in all tanks shall be equivalent to the established potential average rate of rise of floodwaters at any stage.

(11) Each independent pumping unit shall be tested periodically to insure that it is in satisfactory operating condition.

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

Attachment No. 1

Page 3 of 5

**PROPOSED STATE STANDARD,
TITLE 8, DIVISION 1, CHAPTER 4**

(12) Structural guides for holding floating tanks above their foundations shall be so designed that there will be no resistance to the free rise of a tank and shall be constructed of noncombustible material.

(13) The strength of the structure shall be adequate to resist lateral movement of a tank subject to a horizontal force in any direction equivalent to not less than 25 pounds per square foot acting on the projected vertical cross-sectional area of the tank.

(14) Where tanks are situated on exposed points or bends in a shoreline where swift currents in floodwaters will be present, the structures shall be designed to withstand a unit force of not less than 50 pounds per square foot.

(15) The filling of a tank to be protected by water loading (i.e., to load the tank with water to help secure and strengthen it) shall be started as soon as floodwaters reach flood stage. The rate of filling shall be at least equal to the rate of rise of the floodwaters (or the established average potential rate of rise).

(16) Sufficient fuel to operate the water pumps shall be available at all times to insure adequate power to fill all tankage with water.

(17) All valves on connecting pipelines shall be closed and locked in closed position when water loading has been completed.

(18) Where structural guides are provided for the protection of floating tanks, all rigid connections between tanks and pipelines shall be disconnected and blanked off or blinded before the floodwaters reach the bottom of the tank, unless control valves and their connections to the tank are of a type designed to prevent breakage between the valve and the tank shell.

(19) All valves attached to tanks other than those used in connection with water loading operations shall be closed and locked.

(20) If a tank is equipped with a swing line, the swing pipe shall be raised to and secured at its highest position.

(21) Inspections. The Chief of the Division of Occupational Safety and Health shall ensure, and the Chief or the Chief's authorized representative shall conduct periodic inspections to verify:

(A) That all flammable or combustible liquid storage tanks are in compliance with these requirements and so maintained.

(B) That detailed printed instructions of what to do in flood emergencies are properly posted.

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

PROPOSED STATE STANDARD,
TITLE 8, DIVISION 1, CHAPTER 4

(C) That station operators and other employees depended upon to carry out such instructions are thoroughly informed as to the location and operation of such valves and other equipment necessary to effect these requirements.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

Attachment No. 1

Page 5 of 5

PROPOSED STATE STANDARD,
TITLE 8, DIVISION 1, CHAPTER 4

Add New Section 1550 to read:

§1550. Protection of Tanks in Locations That May Be Flooded.

Tanks are subject to the requirements of Section 5605 of the General Industry Safety Orders.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.