



DEPARTMENT OF PUBLIC SAFETY AND CORRECTIONS

Public Safety Services



V. J. BELLA
STATE FIRE MARSHAL

I. J. "MIKE" FOSTER, JR.
GOVERNOR

MEMO

To: District Supervisors, Pat Day, Inspection Personnel
From: Steve Gogreve *SG*
Subject: Protection of supports for above ground flammable and combustible liquids storage tanks
Date: November 23, 1998

Recently some questions have surfaced concerning protection of steel supports on existing above ground flammable and combustible liquids storage tanks. After researching the code as far back as 1955, supports were required to be protected by materials having a fire resistance rating of not less than two (2) hours, except that steel saddles need not be protected if less than 12 inches high. Attached you will find a copy of the 1955 and 1973 code.

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Members.

National Fire Codes

Vol. I

Flammable Liquids and Gases

Revised to July 30

1955

NATIONAL FIRE PROTECTION ASSOCIATION
INTERNATIONAL
60 BATTERYMARCH ST., BOSTON 10, MASS.

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between a container and the center line of the dike shall be 10 feet. Suitable means shall be taken to prevent the accumulation of flammable liquids under adjacent liquefied petroleum gas containers such as by diking, diversion curbs, or grading. Where dikes are used with flammable liquid tanks, no liquefied petroleum gas container shall be located within the dike.

204. Foundations and Supports: Tanks shall rest directly on the ground or on foundations or supports of concrete, masonry, piling, or steel. Exposed piling or steel supports shall be protected by fire-resistive materials to provide a fire-resistance rating of not less than two hours.

* 204-01 ANCHORAGE: Where a tank is located in an area that may be subjected to flooding, the applicable precautions outlined in NFPA No. 30A, Tanks in Locations Subject to Floods (see page 30A-1).

205. Stairs, Platforms and Walkways: Stairs, platforms and walkways shall be of steel, concrete, or wood.

206. Dikes and Walls.

206-01 CRUDE PETROLEUM: Tanks or groups of tanks containing crude petroleum* shall be diked or other suitable means taken to prevent discharge of liquid from endangering adjoining property or reaching waterways. Where a diked enclosure is required under this section, it shall have a capacity not less than that of the tank or tanks served by the enclosure.

206-02 FLAMMABLE LIQUIDS OTHER THAN CRUDE PETROLEUM: Individual tanks or groups of tanks, where deemed necessary by the Chief on account of proximity to waterways, character of topography, or nearness to structures of high value, or to places of habitation or assembly, shall be diked or the yard shall be provided with a curb or other suitable means taken to prevent the spread of liquid onto other property or waterways. Where a diked enclosure is required under this section, it shall have a net capacity not less than that of the largest tank plus 10 per cent of the aggregate capacity of all other tanks served by the enclosure.

206-03 DIKE CONSTRUCTION: Except where protection is provided by natural topography, dikes or retaining walls required under the foregoing section shall be of earth, concrete or solid masonry designed to be liquid tight and to withstand a full hydraulic head, and so constructed as to provide the required protection. Earthen dikes 3 ft. or more in height shall have a flat section at

*Certain products, not petroleum products, handled in special process and chemical plants may have boil-over characteristics somewhat like those of crude petroleum.

* LATTER EDITIONS OF THE CODE ALLOWED UP TO
12 INCHES WITHOUT PROTECTION 2052

26-10 120. Precautions to be Taken While Fire Protection Equipment is Shut Off for Repairs or Alterations

1201. A watchman should be placed on duty and required to continuously patrol all sections of the premises where water is shut off at the sprinkler or other automatic fire protection equipment until such time as protection is restored.

1202. A man should be stationed at the valve so that the valve may be reopened promptly if necessary. It is the intent of this paragraph that the man shall remain within 10 feet of the valve and shall have no other duties than this responsibility. This procedure is considered imperative when fire protection is shut off immediately following a fire.

1203. An inspection should be made of all other fire protection equipment prior to shutting off water in order to make sure they are in operative condition.

1204. In cases of changes of fire protection equipment, all possible work should be done in advance of shutting off water so that final connections can be quickly made and protection promptly restored. Many times it will be found that by careful planning, open outlets can be plugged and protection restored on a portion of the equipment while the alterations are being made.

1205. Where changes are being made in underground piping, all possible piping should be laid before shutting off water for final connections.

NOTE: A commercially available emergency plug or tapered soft wood plug 18 inches long, 1/2-inch smaller than the inside diameter of the pipe at the small end and tapering 1 inch to the large end, can be used as an emergency stop. The wooden plug may be driven tightly into the open end of a pipe or the commercial plug placed in a bell thus permitting the turning of water into portions of the system in case of fire, or unexpected delay in completing the work. One or more, as conditions may warrant, of each size of plugs corresponding to sizes of piping involved in alterations should be provided in advance of shutting off of water. Provide suitable blocks and wedges for backing.

1206. If deemed necessary or practicable by the authority having jurisdiction, the use of temporary feed lines such as temporary piping for reconnection of risers by hose lines, etc., shall be developed to afford maximum protection.

Flammable and Combustible Liquids Code

NFPA No. 30 — 1973

1973 Edition of No. 30

This 1973 edition of the Flammable and Combustible Liquids Code supersedes the 1972 edition and all previous editions. This Code was prepared by the Sectional Committee on General Storage of Flammable Liquids, approved by the NFPA Flammable Liquids Correlating Committee, and adopted by the National Fire Protection Association at its meeting, May 14-18, in St. Louis, MO.

This edition reflects a change in the breakpoint between flammable and combustible liquids from 140° F to 100° F. Numerous changes in the code and in the definitions were made to reflect this change. Other changes or additions were made in the following: 1060, 1071, 13, 2052, 2125, 2145, 2159, 2171, 2173, 2251, 2342, 31, 4020(c), 4210, 5123, 5144, 5520, 6040, 6510, 6260, 7111, 7116, 8612 and 9030. Other changes were made for editorial clarity.

Origin and Development of No. 30

From 1913 to 1957 this standard was written in the form of a municipal ordinance known as the Suggested Ordinance for the Storage, Handling and Use of Flammable Liquids. In 1957 the format was changed from a municipal ordinance to a Code although the technical provisions were retained. During the 59-year existence of this suggested ordinance and Code, numerous editions have been published as conditions and experiences have dictated; for details see NFPA Technical Committee Reports.

2348. Tanks storing Class I, Class II and Class IIIA liquids inside buildings shall be equipped with a device, or other means shall be provided, to prevent overflow into the building. Suitable devices include, but are not limited to, a float valve, a preset meter on the fill line, a valve actuated by the weight of the tank contents, a low head pump which is incapable of producing overflow, or a liquidtight overflow pipe at least one pipe size larger than the fill pipe discharging by gravity back to the outside source of liquid or to an approved location.

24. Supports, Foundations and Anchorage for All Tank Locations.

2410. Tanks shall rest on the ground or on foundations made of concrete, masonry, piling or steel. Tank foundations shall be designed to minimize the possibility of uneven settling of the tank and to minimize corrosion in any part of the tank resting on the foundation. Appendix E of API Standard 650, Specification for Welded Steel Tanks for Oil Storage, and Appendix B of API Standard 620, Recommended Rules for the Design and Construction of Large, Welded, Low-Pressure Storage Tanks,* provide information on tank foundations.

2420. When tanks are supported above the foundations, tank supports shall be installed on firm foundations. Supports for tanks storing Class I, Class II or Class IIIA liquids shall be of concrete, masonry or protected steel. Single wood timber supports (not cribbing) laid horizontally may be used for outside aboveground tanks if not more than 12 inches high at their lowest point.

2430. Steel supports or exposed piling for tanks storing Class I, Class II or Class IIIA liquids shall be protected by materials having a fire resistance rating of not less than two hours, except that steel saddles need not be protected if less than 12 inches high at their lowest point. At the discretion of the authority having jurisdiction, approved water spray protection or its equivalent may be used in lieu of fire-resistive materials to protect supports.

2440. The design of the supporting structure for tanks such as spheres shall require special engineering consideration. Appendix N of the API Standard 620, Recommended Rules for the Design and Construction of Large, Welded, Low-Pressure Storage Tanks,* contains information regarding supporting structures.

*Available from American Petroleum Institute 1801 K St., N.W., Washington, DC 20006.

2450. Every tank shall be so supported that the concentration of loads on the supports shall be observed.

2460. Where a tank is located in an area subject to flooding, the applicable precautions shall be observed.

2470. In areas subject to earthquakes, tank supports and connections shall be designed to resist seismic shocks.

25. Sources of Ignition.

2510. In locations where flammable liquids are stored, precautions shall be taken to prevent the occurrence of igniting sources of ignition. Sources of ignition include flames, lightning, smoking, cutting, grinding, frictional heat, sparks (static, electrical), and other sources of ignition, chemical and physical radiant heat. Recommended Practice No. 77, and Lightning Protection (API Standard C5.1-1969) provide information on sources of ignition.

26. Testing.

2610. All tanks, whether shop-built or field erected, shall be tested before they are placed in service in accordance with the applicable paragraphs of the Code and the ASME Code stamp, API monogram, or Underwriters' Laboratories, Inc., or other recognized testing agency, or compliance with this test. Tanks not tested in accordance with these Codes shall be tested before placed in service in accordance with good engineering practice. The test shall be made to the sections on testing in API Standard 620, 2042 or 2052.

2620. When the vertical length of the tank is such that when filled with liquid the static head at the bottom of the tank exceeds 10 feet, the tank and related piping shall be tested in accordance with the static head thus imposed. The height of the vent above the top of the tank shall be specified in accordance with the static test pressure shall be specified in accordance with the Code.

2630. In addition to the test called for in 2610, the tank and connections shall be tested for

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