

NFPA 30A Automotive and Marine Service Station Code

1996 Edition



National Fire Protection Association, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101
An International Codes and Standards Organization

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NFPA 30A

Automotive and Marine Service Station Code

1996 Edition

This edition of NFPA 30A, *Automotive and Marine Service Station Code*, was prepared by the Technical Committee on Automotive and Marine Service Stations and acted on by the National Fire Protection Association, Inc., at its Annual Meeting held May 20–23, 1996, in Boston, MA. It was issued by the Standards Council on July 18, 1996, with an effective date of August 9, 1996, and supersedes all previous editions.

Changes other than editorial are indicated by a vertical rule in the margin of the pages on which they appear. These lines are included as an aid to the user in identifying changes from the previous edition.

This document has been submitted to ANSI for approval.

Origin and Development of NFPA 30A

This code originated as Chapter 7 of NFPA 30, *Flammable and Combustible Liquids Code*, and was developed by the Technical Committee on Flammable and Combustible Liquids to provide more detailed requirements for service stations and to anticipate the need to address self-service refueling and alternate fuels. It was first adopted in 1984. The second edition, adopted in 1987, recognized unattended self-service refueling, and a third edition, adopted in 1990, incorporated requirements for lubrication-only service facilities.

The fourth edition, adopted in 1993, incorporated several major amendments, the most important of which allowed aboveground fuel storage tanks at retail service stations, based on a Tentative Interim Amendment to the 1990 edition.

This fifth edition of NFPA 30A includes the following significant changes:

- An increase in the maximum allowable aboveground fuel storage for Class II liquids (i.e., diesel fuel) at fleet refueling operations to 20,000 gal per tank, with a maximum aggregate capacity of 80,000 gal.
- A new Chapter 10 has been added that provides comprehensive fire safety requirements for marine service stations, including fuel-dispensing practices.
- More specific requirements for installation and function of the emergency shear valve at the base of the fuel dispenser.
- New Section 3-8.

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NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents on safeguarding against the fire and explosion hazards associated with the storage, handling, and dispensing of flammable and combustible liquids at automotive and marine service stations and with related activities such as lubrication, minor repairs, adjustments, and routine maintenance work.

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Appendix A.

Information on referenced publications can be found in Chapter 11 and Appendix C.

FOREWORD

This code, known as the *Automotive and Marine Service Station Code*, is recommended for use as the basis for legal regulations. Its provisions are intended to reduce the hazard to a degree consistent with reasonable public safety, without undue interference with public convenience and necessity that requires the use of flammable and combustible liquids. Thus, compliance with this code does not eliminate all hazards in the use of flammable and combustible liquids.

See the *Flammable and Combustible Liquids Code Handbook* for additional explanatory information.

Chapter 1 General Provisions

1-1 Scope and Application.

1-1.1 This code shall apply to automotive service stations, marine service stations, service stations located inside buildings, and fleet vehicle service stations.

1-1.2 This code shall not apply to those service stations, or portions of service stations, where liquefied petroleum gases, liquefied natural gases, or compressed natural gases are dispensed as automotive fuels. [See NFPA 58, *Standard for the Storage and Handling of Liquefied Petroleum Gases*, and NFPA 52, *Standard for Compressed Natural Gas (CNG) Vehicular Fuel Systems*.]

1-1.3 This code shall not apply to fueling facilities at remote locations for large, off-the-road earthmoving and construction vehicles.

1-1.4 Reference shall also be made to NFPA 302, *Fire Protection Standard for Pleasure and Commercial Motor Craft*, for safety precautions while fueling at marine service stations; to NFPA 303, *Fire Protection Standard for Marinas and Boatyards*, for additional requirements applicable to marine service stations; and to NFPA 88B, *Standard for Repair Garages*, for additional requirements for automotive repair facilities.

1-2 Definitions.

Aboveground Storage Tank. A horizontal or vertical tank that is listed and intended for fixed installation, without backfill, above or below grade, and is used within the scope of its approval or listing.

Approved.* Acceptable to the authority having jurisdiction.

Authority Having Jurisdiction.* The organization, office, or individual responsible for approving equipment, an installation, or a procedure.

Basement. A story of a building or structure having one-half or more of its height below ground level and to which access for fire-fighting purposes is unduly restricted.

Bulk Plant or Terminal. That portion of a property where liquids are received by tank vessel, pipelines, tank car, or tank vehicle and are stored or blended in bulk for the purpose of distributing such liquids by tank vessel pipeline, tank car, tank vehicle, portable tank, or container.

Closed Container. A container as herein defined, so sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures.

Combustible Liquid. A liquid having a flash point at or above 100°F (37.8°C).

Combustible liquids shall be subdivided as follows:

(a) Class II liquids shall include those having flash points at or above 100°F (37.8°C) and below 140°F (60°C).

(b) Class IIIA liquids shall include those having flash points at or above 140°F (60°C) and below 200°F (93°C).

(c) Class IIIB liquids shall include those having flash points at or above 200°F (93°C).

(See Appendix B for information about typical liquids found at service stations.)

Container. Any vessel of 60 U.S. gal (227 L) or less capacity used for transporting or storing liquids.

Dispensing Device, Overhead Type.* A dispensing device that consists of one or more individual units intended for installation in conjunction with each other, mounted above a dispensing area typically within the service station canopy structure, and characterized by the use of an overhead hose reel.

Fire-Resistant Tank. A listed aboveground tank that provides fire-resistive protection from exposures to a high-intensity liquid pool fire (see 2-4.5).

Flammable Liquid. A liquid having a flash point below 100°F (37.8°C) and having a vapor pressure not exceeding 40 psia (2068 mm Hg) at 100°F (37.8°C) shall be known as a Class I liquid.

Class I liquids shall be subdivided as follows:

(a) Class IA liquids shall include those having flash points below 73°F (22.8°C) and having a boiling point below 100°F (37.8°C).

(b) Class IB liquids shall include those having flash points below 73°F (22.8°C) and having a boiling point at or above 100°F (37.8°C).

(c) Class IC liquids shall include those having flash points at or above 73°F (22.8°C) and below 100°F (37.8°C).

(See Appendix B for information about typical liquids found at service stations.)

Fleet Vehicle Service Station. That portion of a commercial, industrial, governmental, or manufacturing property where liquids used as fuels are stored and dispensed into the fuel tanks of motor vehicles that are used in connection with such businesses, by persons within the employ of such businesses.

Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation that maintains periodic inspection of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Listed.* Equipment, materials, or services included in a list published by an organization acceptable to the authority having jurisdiction and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, or service meets identified standards or has been tested and found suitable for a specified purpose.

Portable Tank. Any closed vessel having a liquid capacity over 60 U.S. gal (227 L) and not intended for fixed installation.

Safety Can. An approved container, of not more than 5 gal (18.9 L) capacity, having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.

Service Stations.

Automotive Service Station. That portion of a property where liquids used as motor fuels are stored and dispensed from fixed equipment into the fuel tanks of motor vehicles or approved containers and shall include any facilities for the sale and service of tires, batteries, and accessories. This occupancy designation shall also apply to buildings, or portions of buildings, used for lubrication, inspection, and minor automotive maintenance work, such as tune-ups and brake system repairs. Major automotive repairs, painting, and body and fender work are excluded.

Marine Service Station. That portion of a property where liquids used as fuels are stored and dispensed from equipment on shore, piers, wharves, or floating docks into the fuel tanks of self-propelled craft and shall include all facilities used in connection therewith.

Service Station Located inside Buildings. That portion of an automotive service station located within the perimeter of a building or building structure that also contains other occupancies. The service station may be enclosed or partially enclosed by the building walls, floors, ceilings, or partitions or may be open to the outside. The service station dispensing area shall mean that area of the service station required for dispensing of fuels to motor vehicles. Dispensing of fuel at manufacturing, assembly, and testing operations is not included within this definition.

Vapor Processing Equipment. Those components of a vapor processing system that are designed to process vapors or liquids captured during filling operations at service stations, bulk plants, or terminals.

Vapor Processing System. A system designed to capture and process vapors displaced during filling operations at service stations, bulk plants, or terminals by use of mechanical and/or chemical means. Examples are systems using blower-assist for capturing vapors and refrigeration, absorption, and combustion systems for processing vapors.

Vapor Recovery System. A system designed to capture and retain, without processing, vapors displaced during filling operations at service stations, bulk plants, or terminals. Examples are balanced-pressure vapor displacement systems and vacuum-assist systems without vapor processing.

Ventilation. As specified in this code, ventilation is for the prevention of fire and explosion. It is considered adequate if it is sufficient to prevent accumulation of significant quantities

of vapor-air mixtures in concentration over one-fourth of the lower flammable limit.

1-3 Retroactivity. The provisions of this document are considered necessary to provide a reasonable level of protection from loss of life and property from fire and explosion. They reflect situations and the state of the art prevalent at the time the standard was issued.

Unless otherwise noted, it is not intended that the provisions of this document be applied to facilities, equipment, structures, or installations that were existing or approved for construction or installation prior to the effective date of this document, except in those cases where it is determined by the authority having jurisdiction that the existing situation involves a distinct hazard to life or adjacent property.

1-4 Equivalency. Nothing in this code is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this code provided technical documentation is submitted to the authority having jurisdiction to demonstrate equivalency and provided the system, method, or device is approved for the intended purpose.

Chapter 2 Storage

2-1 General Provisions.

2-1.1 Liquids shall be stored in:

- (a) Approved closed containers not exceeding 60 gal (227 L) capacity;
- (b) Tanks in special enclosures inside buildings as described in Section 2-2;
- (c) Aboveground tanks supplying marine service stations as provided in 2-1.6;
- (d) An approved tank that is part of a fuel dispensing system as provided for in 9-3.5;
- (e) Tanks located underground as in Section 2-4 of NFPA 30, *Flammable and Combustible Liquids Code*;
- (f) Tanks or containers inside service station buildings as provided for in 2-3.3 and 2-3.4; or
- (g) Aboveground storage tanks located at service stations with the approval of the authority having jurisdiction and as provided for in Section 2-4.

2-1.2 Vent pipes on tanks storing gasoline shall be in accordance with NFPA 30, *Flammable and Combustible Liquids Code*, paragraphs 2-4.5.1, 2-4.5.2, and 2-4.5.6, as applicable, and shall discharge only upward in order to disperse vapors. (*Also see 9-3.3, 9-3.4, and 9-3.5 of this code.*)

2-1.3 Apparatus dispensing Class I liquids into the fuel tanks of motor vehicles of the public shall not be located at a bulk plant unless separated by a fence or similar barrier from the area in which bulk operations are conducted. Aboveground tanks located at a bulk plant shall not be connected by piping to service station tanks.

2-1.4 Class I liquids shall not be stored or handled within a building having a basement or pit into which flammable vapors can travel, unless such area is provided with ventilation that will prevent the accumulation of flammable vapors therein.

2-1.5* Accurate daily inventory records shall be maintained and reconciled on all Class I liquid and diesel fuel storage tanks for indication of possible leakage from tanks or piping. The records shall be kept at the premises or made available for inspection by the enforcing authority within 24 hours of a written or verbal request. The records shall include, as a minimum, records showing, by product, daily reconciliation between sales, use, receipts, and inventory on hand. If there is more than one system consisting of a tank(s) serving a separate pump(s) or dispenser(s) for any product, the reconciliation shall be maintained separately for each tank system.

2-1.6 Tanks supplying marine service stations and pumps not integral with the dispensing device shall be on shore or on a pier of the solid-fill type, except as provided in (a) and (b).

(a) Where shore location would require excessively long supply lines to dispensers, tanks shall be permitted to be located on a pier, provided that applicable portions of NFPA 30, *Flammable and Combustible Liquids Code*, Chapter 2, relative to spacing, diking, and piping, and Chapter 5, Table 5-9.5.3, relative to electrical classification, are complied with and the quantity so stored does not exceed 1100 gal (4164 L) aggregate capacity.

(b) Shore tanks supplying marine service stations shall be permitted to be located above ground where rock ledges or high water tables make underground tanks impractical. (See also Section 2-4.)

2-1.7 Where tanks are at an elevation that produces a gravity head on the dispensing device, the tank outlet shall be equipped with a device, such as a solenoid valve, positioned adjacent to and downstream from the valve specified in 2-3.8.1 of NFPA 30, *Flammable and Combustible Liquids Code*, so installed and adjusted that liquid cannot flow by gravity from the tank in case of piping or hose failure when the dispenser is not in use.

2-2 Special Enclosures.

2-2.1 Where installation of tanks in accordance with NFPA 30, *Flammable and Combustible Liquids Code*, Section 2-4 is impractical because of property or building limitations, tanks for liquids shall be permitted to be installed in buildings if enclosed as described in 2-2.2 and upon specific approval of the authority having jurisdiction.

2-2.2 Enclosures shall be substantially liquidtight and vapor-tight without backfill. Sides, top, and bottom of the enclosure shall be of reinforced concrete at least 6 in. (15 cm) thick, with openings for inspection through the top only. Tank connections shall be so piped or closed that neither vapors nor liquid can escape into the enclosed space. Means shall be provided to use portable equipment to discharge to the outside any liquid or vapors that might accumulate should leakage occur.

2-2.3 At automotive service stations provided in connection with tenant or customer parking facilities in large buildings of commercial, mercantile, or residential occupancy, tanks con-

taining Class I liquids installed in accordance with 2-2.2 shall not exceed 6000 gal (22,710 L) individual or 18,000 gal (68,130 L) aggregate capacity.

2-3 Inside Buildings.

2-3.1 Except where stored in tanks as provided in Section 2-2, no Class I liquids shall be stored within any service station building except in closed containers of aggregate capacity not exceeding 120 gal (454.2 L). One container not exceeding 60 gal (227 L) capacity equipped with a listed pump shall be permitted.

2-3.2 Class I liquids shall be permitted to be transferred from one container to another in lubrication or service rooms of a service station building provided the electrical installation complies with Chapter 7 and provided that any heating equipment complies with Chapter 8. See also Section 9-7 for other possible sources of ignition.

2-3.3 Class II and Class IIIA liquids shall be permitted to be stored and dispensed inside service station buildings from approved tanks of not more than 120 gal (454 L) for each class, with an aggregate capacity not exceeding 240 gal (908 L).

2-3.4 Class IIIB liquids shall be permitted to be stored in and dispensed from tanks and containers meeting the requirements of Sections 2-2 and 4-2 of NFPA 30, *Flammable and Combustible Liquids Code*, as applicable, inside service station buildings. Tanks and containers that contain only crankcase drainings shall be considered to be containing Class IIIB liquids.

2-3.4.1 Tanks storing Class IIIB liquids inside service station buildings shall be permitted to be located at, below, or above grade provided that adequate drainage or containment is provided.

2-4 Aboveground Storage Tanks at Service Stations.

2-4.1* Except as modified by the provisions of this section, aboveground storage tanks shall comply with the applicable provisions in Chapters 2 and 3 of NFPA 30, *Flammable and Combustible Liquids Code*.

2-4.1.1 Only aboveground storage tanks shall be used. Tanks designed and built for underground use shall not be installed for aboveground use.

2-4.2 Tank Location and Capacity.

2-4.2.1 Tanks storing Class I and Class II liquids at an individual site shall be limited to a maximum individual capacity of 12,000 gal (45,600 L) and an aggregate capacity of 40,000 gal (152,000 L). Tanks storing Class II and Class IIIA liquids at a fleet vehicle service station shall be limited to a maximum individual fueling capacity of 20,000 gal (76,000 L) and an aggregate capacity of 80,000 gal (304,000 L).

2-4.2.2 Tanks shall be located at least:

- (a) 50 ft (15 m) from the nearest important building on the same property;
- (b) 50 ft (15 m) from any fuel dispenser;
- (c) 50 ft (15 m) from the nearest side of a public way; and
- (d) 100 ft (30 m) from any property line that is or might be built upon, including the opposite side of a public way.

Exception No. 1: All distances shall be permitted to be reduced by 50 percent if the tanks are fire-resistant tanks, as defined in Section 1-2, or are installed in vaults that comply with 2-4.4.

Exception No. 2: At commercial, industrial, governmental, or manufacturing establishments, where the tanks are intended for fueling vehicles used in connection with their business, no minimum distance shall be required by 2-4.2.2(b) if the tanks are fire-resistant tanks, as defined in Section 1-2, or are installed in vaults that comply with 2-4.4.

2-4.3 Control of Spillage. Spill control shall be provided in accordance with 2-3.4 of NFPA 30, *Flammable and Combustible Liquids Code*.

Exception: Tanks installed in vaults that comply with 2-4.4 of this code are not required to meet this requirement.

2-4.4 Vaults. Vaults shall be permitted to be either above or below grade and shall comply with the following:

(a) The vault shall completely enclose each tank. There shall be no 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 in. (15 cm) thick. The top of an above-grade vault shall be constructed of noncombustible material and shall be designed to be weaker than the walls of the vault, to ensure that the thrust of any explosion occurring inside the vault is directed upward before significantly high pressure can develop within the vault. The top of an at-grade or below-grade vault shall be designed to safely relieve or contain the force of any explosion occurring inside the vault. The top and floor of the vault and the tank foundation shall be designed to withstand the anticipated loading, including loading from vehicular traffic, where applicable. The walls and floor of any vault installed below grade shall be designed to withstand anticipated soil and hydrostatic loading. The vault shall be substantially liquidtight and there shall 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 its appurtenances.

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

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

(d) Each tank shall be in its own vault. Adjacent vaults may share a common wall.

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

(f) Vaults that contain tanks of Class I liquids shall be provided with continuous ventilation at a rate of not less than 1 ft³ per min per ft² of floor area (0.3 m³ per min per m²), but not less than 150 cfm (4 m³ per min). 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 in. (7.6 cm), but not more than 12 in. (30.5 cm), of the floor. The exhaust system shall be installed in accordance with the provisions of NFPA 91, *Standard for Exhaust Systems for Air Conveying of Materials*. Means

shall be provided to automatically detect any flammable vapors and to automatically shut down the dispensing system upon detection of such flammable vapors in the exhaust duct at a concentration of 25 percent of the lower flammable limit.

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

(h) Means shall be provided to recover liquid from the vault. If a pump is used to meet this requirement, the pump shall not be permanently installed in the vault. Electric-powered portable pumps shall be suitable for use in Class I, Division 1 locations, as defined in NFPA 70, *National Electrical Code*[®].

(i) Vent pipes that are provided for normal tank venting shall terminate at least 12 ft (3.6 m) above ground level.

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

(k) 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. Each entry point shall be secured against unauthorized entry and vandalism.

(l) Each vault shall be provided with a suitable means to admit a fire suppression agent.

(m) The interior of any vault containing a tank that stores a Class I liquid shall be designated a Class I, Division 1 location, as defined in NFPA 70, *National Electrical Code*.

2-4.5* Fire-Resistant Tanks. Fire-resistant tanks shall be listed for the use intended and shall comply with all of the following:

(a) The construction that provides the required fire-resistance shall prevent release of liquid, failure of the primary tank, failure of the supporting structure, and impairment of venting for a period of not less than 2 hours when tested using a fire exposure that simulates a high-intensity pool fire, such as that described in UL 2085, *Standard for Insulated Aboveground Tanks for Flammable and Combustible Liquids*, or equivalent test procedure.

(b) There shall be no openings except those necessary for access to, inspection of, filling, emptying, and venting of the tank. All openings shall be located in the top of the tank.

(c) Each fire-resistant tank shall be suitably anchored to withstand uplifting by groundwater or flooding, including when the tank is empty.

(d) Each fire-resistant tank shall be resistant to damage from impact of a motor vehicle or shall be protected by suitable collision barriers.

(e) Vent pipes that are provided for normal tank venting shall terminate at least 12 ft (3.6 m) above ground level.

(f) Paragraph 2-3.6.7 of NFPA 30, *Flammable and Combustible Liquids Code*, shall not be used to reduce the size of the emergency vent.

2-4.6 Piping and Ancillary Equipment.

2-4.6.1 Means shall be provided for determining the liquid level in each tank and this means shall be accessible to the delivery operator. Means shall be provided to sound an audible alarm when the liquid level in the tank reaches 90 percent of capacity.

Means shall also be provided to automatically stop the flow of liquid into the tank when the liquid level in the tank reaches 95 percent of capacity. These provisions shall not restrict or interfere with the proper operation of either the normal vent or the emergency vent.

2-4.6.2 Fuel shall not be dispensed from the tank by either gravity flow or pressurization of the tank. Means shall be provided to prevent the release of liquid by siphon flow.

2-4.6.3 Where a tank is at an elevation that produces a gravity head on the dispensing device, the tank outlet shall be equipped with a device (such as a normally closed solenoid valve) that will prevent gravity flow from the tank to the dispenser. 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.

2-4.6.4 If a submersible pump system is used, a listed emergency shutoff valve shall be installed at each dispensing device, as required by 4-3.6.

2-4.6.5 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.

Exception: Tanks installed in below-grade vaults are not required to comply with this requirement.

2-4.6.6 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.

2-4.6.7 Piping shall be routed so that exposure to physical damage is minimized.

2-4.7 Physical Protection.

2-4.7.1 Tanks not enclosed in vaults shall be enclosed with a chain link fence at least 6 ft (2 m) high. The fence shall be separated from the tanks by at least 10 ft (3 m) and shall have a gate that is secured against unauthorized entry. Aboveground tanks shall be resistant to damage from the impact of a motor vehicle or shall be protected by collision barriers.

Exception: Tanks are not required to be enclosed within a fence if the property on which the tanks are located already has a perimeter security fence.

2-4.7.2 The area within the fence and within any dike shall be kept free of vegetation, debris, and any other material that is not necessary to the proper operation of the tank and piping system.

2-4.8 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.

2-4.9 Tank Filling Operations.

2-4.9.1 Delivery operations shall comply with applicable requirements of NFPA 385, *Standard for Tank Vehicles for Flammable and Combustible Liquids*, and with the requirements of 2-4.9.2 through 2-4.9.4.

2-4.9.2 The delivery vehicle shall be separated from any aboveground tank by at least 25 ft (7.6 m).

Exception No. 1: No minimum separation distance shall be required for tanks that are filled by gravity.

Exception No. 2: The required minimum separation distance shall be permitted to be reduced to 15 ft (4.6 m) where the fuel being delivered is not a Class I liquid.

2-4.9.3 Tank filling shall not begin until the delivery operator has determined tank ullage (available capacity).

2-4.9.4 All tanks shall be filled through a liquid-tight connection. Where 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 at a point where connection and disconnection is made between the tank and the delivery vehicle. This device shall be protected from tampering and physical damage.

Chapter 3 Piping, Valves, and Fittings

3-1 General. The design, fabrication, assembly, test, and inspection of the piping system shall be in accordance with NFPA 30, *Flammable and Combustible Liquids Code*, Chapter 3, except that, where dispensing is from a floating structure, suitable lengths of oil-resistant flexible hose shall be permitted to be used between the shore piping and the piping on the floating structure as made necessary by change in water level or shoreline.

3-2 Stray Currents. Where excessive stray currents are encountered, piping handling Class I and Class II liquids at marine service stations shall be electrically insulated from the shore piping.

3-3 Location. Piping shall be located so as to be protected from physical damage.

3-4 Shutoff Valves. A readily accessible valve to shut off the supply from shore shall be provided in each pipeline at or near the approach to the pier and at the shore end of each marine pipeline adjacent to the point where a flexible hose is attached.

3-5 Post-Installation Testing. After completion of the installation, including any paving, that section of the pressure piping system between the pump discharge and the connection for the dispensing facility shall be tested for at least 30 minutes at the maximum operating pressure of the system.

3-6* Identification of Piping. Each fill pipe for liquid storage shall be identified by color code or other marking to identify the product for which the tank is used. The color code or marking shall be maintained in legible condition throughout the life of the tank installation.

3-7 Protection Against Excess Pressure. Shutoff and check valves shall be equipped with a pressure-relieving device that will relieve any pressure generated by thermal expansion of the contained liquid back to the storage tank.

3-8 Low Melting Point Materials. Piping components constructed of low melting point materials shall be permitted to be used without backfill in below-grade underground tank sumps.

Chapter 4 Fuel Dispensing System

4-1 Location of Dispensing Devices and Emergency Power Cutoff.

4-1.1 Dispensing devices at an automotive service station shall be so located that all parts of the vehicle being served will be on the premises of the service station. Openings beneath enclosures shall be sealed to prevent the flow of leaking fuel to lower building spaces.

Dispensing devices at marine service stations shall be permitted to be located on open piers, wharves, floating docks, or on shore, or on piers of the solid-fill type, and shall be located apart from other structures so as to provide room for safe ingress and egress of craft to be fueled. Dispensing devices shall be in all cases at least 20 ft (6 m) from any activity involving fixed sources of ignition. Dispensing devices located inside buildings shall comply with Chapter 6.

4-1.2 A clearly identified and easily accessible switch(es) or circuit breaker(s) shall be provided at a location remote from dispensing devices, including remote pumping systems, to shut off the power to all dispensing devices in the event of an emergency. (See 9-4.5 and 9-5.3 for applicable requirements for proper location of the emergency controls.)

4-2 Fuel Dispensing Devices.

4-2.1 Class I liquids and Class II liquids shall be transferred from tanks by means of fixed pumps designed and equipped to allow control of the flow and prevent leakage or accidental discharge.

4-2.2 Dispensing devices for Class I liquids shall be listed. Existing listed or labeled dispensing devices shall be permitted to be modified provided that the modifications made are "Listed by Report" by an approved testing laboratory or as otherwise approved by the authority having jurisdiction. Modification proposals shall contain a description of the component parts used in the modification and the recommended methods of installation on specific dispensing devices, and they shall be made available to the authority having jurisdiction upon request.

4-2.3 A control shall be provided that will permit the pump to operate only when a dispensing nozzle is removed from its bracket or normal position with respect to the dispensing device and the switch on this dispensing device is manually actuated. This control shall also stop the pump when all nozzles have been returned, either to their brackets or to the normal nondispensing position.

4-2.4 Liquids shall not be dispensed by applying pressure to drums, barrels, and similar containers. Listed pumps taking suction through the top of the container or listed self-closing faucets shall be used.

4-2.5 Dispensing devices, except those attached to containers, shall either be mounted on a concrete island or otherwise protected against collision damage by suitable means and shall be securely bolted in place. If located indoors, the dispensing device shall also be located in a position where it cannot be struck by a vehicle that is out of control descending a ramp or other slope. The installation shall be in accordance with the manufacturer's instructions.

4-2.6 Listed hose assemblies shall be used to dispense fuel. Hose length at automotive service stations shall not exceed 18 ft (5.5 m). Where hose length at marine service stations exceeds 18 ft (5.5 m), the hose shall be secured so as to protect it from damage.

4-2.7 A listed emergency breakaway device designed to retain liquid on both sides of the breakaway point shall be installed on each hose dispensing Class I liquids. Such devices shall be installed and maintained in accordance with the manufacturer's instructions.

Where hoses are attached to a hose-retrieving mechanism, the listed emergency breakaway device shall be installed between the point of attachment of the hose-retrieving mechanism to the hose and the hose nozzle valve.

Exception: Such devices shall not be required at marine service stations.

4-2.8 Dispensing devices used to fill portable containers with home heating fuels shall be located at least 20 ft (6 m) from any dispensing devices for Class I liquids. Dispensing devices for liquefied petroleum gas (LPG), liquefied natural gas (LNG), and compressed natural gas (CNG) shall also be located at least 20 ft (6 m) from any dispensing device for Class I liquids.

4-2.9 When maintenance to Class I dispensing devices becomes necessary and such maintenance might allow the accidental release or ignition of liquid, the following precautions shall be taken before such maintenance is begun:

(a) Only persons knowledgeable in performing the required maintenance shall perform the work.

(b) All electrical power to the dispensing devices, to the pump serving the dispensing devices, and to all associated control circuits shall be shut off at the main electrical disconnect panel.

(c) The emergency shutoff valve at the dispenser, if installed, shall be closed.

(d) All vehicle traffic and unauthorized persons shall be prevented from coming within 20 ft (6 m) of the dispensing device.

4-3 Remote Pumping Systems.

4-3.1 This section shall apply to systems for dispensing Class I liquids and Class II liquids where such liquids are transferred from storage to individual or multiple dispensing devices by pumps located other than at the dispensing devices.

4-3.2 Pumps shall be listed and designed or equipped so that no part of the system will be subjected to pressures above its allowable working pressure.

4-3.3 Each pump shall have installed on the discharge side a listed leak detection device that will provide an indication if the piping and dispensers are not essentially liquidtight. Each leak-detecting device shall be checked and tested at least annually according to the manufacturer's specifications to ensure proper installation and operation.

4-3.4 Pumps installed above grade, outside of buildings, shall be located not less than 10 ft (3 m) from lines of adjoining property that can be built upon and not less than 5 ft (1.5 m) from any building opening. Where an outside pump location is impractical, pumps shall be permitted to be installed inside buildings as provided for dispensers in Section 4-1 or in pits as provided in 4-3.5. Pumps shall be substantially anchored and protected against physical damage.

4-3.5 Pits for subsurface pumps or piping manifolds of submersible pumps shall withstand the external forces to which they can be subjected without damage to the pump, tank, or piping. The pit shall be no larger than necessary for inspection and maintenance and shall be provided with a fitted cover.

4-3.6 A rigidly anchored listed automatic emergency shutoff valve shall be installed in accordance with the manufacturer's instructions in each supply line at the base of each individual island-type dispenser or at the inlet of each overhead dispensing device. This valve shall incorporate a fusible link or other thermally actuated device that will close the valve in the event of fire exposure. This valve shall also incorporate a mechanism to close the valve in the event of severe impact or displacement of the dispenser. If the valve incorporates a shear section, the valve shall be rigidly anchored so that the shear section functions as intended. An emergency shutoff valve incorporating a slip-joint feature shall not be used. The automatic closing feature of this valve shall be checked at the time of initial installation and at least once a year thereafter by manually tripping the hold-open linkage.

4-3.7 A vapor return pipe inside the dispenser housing shall have a shear section or flexible connector so that the liquid emergency shutoff valve will function as described in 4-3.6.

4-4 Vapor Recovery Systems.

4-4.1 Dispensing devices incorporating provisions for vapor recovery shall be listed.

4-4.2 Hose nozzle valves used on vapor recovery systems shall be listed.

4-4.3 Means shall be provided in the vapor return path from each dispensing outlet to prevent the discharge of vapors when the hose nozzle valve is in its normal nondispensing position.

4-5 Vapor Processing Systems.

4-5.1 Vapor processing system components consisting of hose nozzle valves, blowers or vacuum pumps, flame arresters or systems for prevention of flame propagation, controls, and vapor processing equipment shall be individually listed for use in a specified manner.

4-5.2 Dispensing devices used with a vapor processing system shall be listed. Existing listed or labeled dispensing devices shall be permitted to be modified for use with vapor processing systems provided they are "Listed by Report" as specified in 4-2.2.

4-5.3 Means shall be provided in the vapor return path from each dispensing outlet to prevent the discharge of vapors when the hose nozzle valve is in its normal nondispensing position.

4-5.4 Vapor processing systems employing blower-assist shall not be used unless the system is designed to prevent flame propagation through system piping, processing equipment, and tanks.

4-5.5 If a component is likely to contain a flammable vapor-air mixture under operating conditions, and can fail in a manner to ignite the mixture, it shall be designed to withstand an internal explosion without failure to the outside.

4-5.6 Vapor processing equipment shall be located outside of buildings at least 10 ft (3 m) from adjacent property lines that can be built upon, except as provided for in 4-5.7. Vapor processing equipment shall be located a minimum of 20 ft (6 m) from dispensing devices. Processing equipment shall be protected against physical damage by the provision of guardrails, curbs, or fencing.

4-5.7 Where the required distance to adjacent property lines that can be built upon as specified in 4-5.6 cannot be obtained, means shall be provided to protect vapor processing equipment against fire exposure. Such means shall be permitted to include protective enclosures that extend at least 18 in. (45.7 cm) above the equipment constructed of fire-resistant or noncombustible materials, installation in below-grade spaces, or protection with an approved water spray system. If protective enclosures or below-grade spaces are used, positive means shall be provided to ventilate the volume within the enclosure to prevent pocketing of flammable vapors. In no case shall vapor processing equipment so protected be located within 5 ft (1.5 m) of adjacent property lines that can be built upon.

4-5.8 Electrical equipment shall be in accordance with Chapter 7.

4-5.9 Vents on vapor processing systems shall be not less than 12 ft (3.6 m) above adjacent ground level, with outlets so directed and located that flammable vapors will not accumulate or travel to an unsafe location or enter buildings.

4-5.10 Combustion or open flame-type devices shall not be installed in a classified area. (See Chapter 7.)

Chapter 5 Pits and Below-Grade and Sub-Floor Work Areas

5-1 Pits, below-grade work areas, and sub-floor work areas used for lubrication, inspection, and minor automotive maintenance work shall comply with the provisions of this chapter, in addition to other applicable requirements of this code.

5-1.1 Walls, floors, and structural supports shall be constructed of masonry, concrete, or other suitable noncombustible materials.

5-1.2 In pits, below-grade work areas, and sub-floor work areas, the required number, location, and construction of means of egress shall comply with the provisions for special purpose industrial occupancies in Chapter 28 of NFPA 101[®], *Life Safety Code*[®]. Stairs shall be noncombustible, slip-proof, and constructed with no accessible space underneath.

5-1.3 Pits, below-grade work areas, and sub-floor work areas shall be provided with exhaust ventilation at a rate of not less than 1 cfm per ft² (0.3 m³ per min per m²) of floor area at all times that the building is occupied or when vehicles are parked in or over these areas. Exhaust air shall be taken from a point within 12 in. (0.3 m) of the floor of the pit, below-grade work area, or sub-floor work area.

Chapter 6 Service Stations Located inside Buildings

6-1 General.

6-1.1 A service station shall be permitted inside a building subject to approval of the authority having jurisdiction.

6-1.2 The service station shall be separated from other portions of the building by wall, partition, floor, or floor-ceiling assemblies having a fire resistance rating of not less than 2 hr.

6-1.3 Interior finish of service stations shall be constructed of noncombustible or approved limited-combustible materials.

6-1.4 Door and window openings in interior walls shall be provided with listed 1 1/2-hr (B) fire doors. Doors shall be self-clos-

ing or shall be permitted to remain open during normal operations if they are designed to close automatically in a fire emergency by provision of listed closure devices. Fire doors shall be installed in accordance with NFPA 80, *Standard for Fire Doors and Fire Windows*.

6-1.5 Fire doors shall be kept unobstructed at all times. Appropriate signs and markings shall be used.

6-1.6 Openings in interior partitions and walls for ducts shall be protected by listed fire dampers. Openings in floor or floor-ceiling assemblies for ducts shall be protected with enclosed shafts. Enclosure of shafts shall be with wall or partition assemblies having a fire resistance rating of not less than 2 hr. Openings in enclosed shafts, for ducts, shall be protected with listed fire dampers.

6-2 Dispensing Area.

6-2.1 The dispensing area shall be located at street level, with no dispenser located more than 50 ft (15 m) from the vehicle exit to, or entrance from, the outside of the building.

6-2.2 Dispensing shall be limited to the area required to serve not more than four vehicles at one time.

Exception: At fleet vehicle service stations, where only Class II and Class III liquids are dispensed, the number of vehicles serviced at any one time shall be permitted to be increased to 12.

6-3 Ventilation.

6-3.1 Forced air heating, air conditioning, and ventilating systems serving the service station area shall not be interconnected with any such systems serving other parts of the building. Such systems shall be installed in accordance with the provisions of NFPA 90A, *Standard for the Installation of Air Conditioning and Ventilating Systems*.

6-3.2 A mechanical exhaust system shall be provided to serve only the dispensing area. This system shall be interlocked with the dispensing system such that air flow is established before any dispensing device can operate. Failure of air flow shall automatically shut down the dispensing system.

6-3.3 The exhaust system shall be designed to provide air movement across all portions of the dispensing area floor and to prevent the flow of flammable vapors beyond the dispensing area. Exhaust inlet ducts shall not be less than 3 in. (7.6 cm) nor more than 12 in. (0.30 m) above the floor. Exhaust ducts shall not be located in floors, or penetrate the floor of the dispensing area, and shall discharge to a safe location outside the building.

6-3.4 The exhaust system shall provide ventilation at a rate of not less than 1 cfm per ft² (0.3 m³ per min per m²) of dispensing area.

6-3.5 The exhaust system shall be installed in accordance with the provisions of NFPA 91, *Standard for Exhaust Systems for Air Conveying of Materials*.

6-3.6 The provisions of 6-3.2, 6-3.3, 6-3.4, and 6-3.5 shall not apply to a service station located inside a building if two or more sides of the dispensing area are open to the building exterior such that natural ventilation can normally be expected to dissipate flammable vapors.

6-4 Piping.

6-4.1 Piping systems shall comply with the provisions of Chapter 3 of NFPA 30, *Flammable and Combustible Liquids Code*.

6-4.2 All fuel and flammable vapor piping inside buildings but outside the service station area shall be enclosed within a horizontal chase or a vertical shaft used only for this piping. Ver-

tical shafts and horizontal chases shall be constructed of materials having a fire resistance rating of not less than 2 hr.

6-5 Drainage Systems.

6-5.1 Floors shall be liquidtight. Emergency drainage systems shall be provided to direct flammable or combustible liquid leakage and fire protection water to a safe location. This might require curbs, scuppers, or special drainage systems.

6-5.2 Emergency drainage systems, if connected to public sewers or discharged into public waterways, shall be equipped with traps or separators.

Chapter 7 Electrical Equipment

7-1 Scope. This chapter shall apply to the installation of electrical wiring and electrical utilization equipment in areas where liquids are stored, handled, or dispensed.

7-2 General Requirements.

7-2.1 All electrical wiring and electrical utilization equipment shall be of a type specified by and shall be installed in accordance with NFPA 70, *National Electrical Code*.

7-2.2 All electrical wiring and electrical utilization equipment shall be suitable for the locations in which they are installed.

7-3 Installation in Classified Locations.

7-3.1 Table 7 shall be used to delineate and classify areas for the purpose of installation of electrical wiring and electrical utilization equipment. The designation of classes and divisions of classified locations is defined in Chapter 5, Article 500, of NFPA 70, *National Electrical Code*.

Exception: The extent of the classified area around a vacuum-assist blower shall be permitted to be reduced if the blower is specifically listed for such reduced distances.

7-3.1.1 A designated classified area shall not extend beyond a solid floor, wall, roof, or other partition that has no communicating openings.

7-3.2 The area classifications given in Table 7 shall be based on the premise that the installation meets the applicable requirements of this code in all respects. Should this not be the case, the authority having jurisdiction shall be permitted to determine the extent of the classified area.

7-3.3 All electrical wiring and electrical utilization equipment that is integral with the dispensing hose or nozzle shall be suitable for use in Class I, Division 1 classified locations.

7-3.4 Where Class I liquids are stored, handled, or dispensed, electrical wiring and electrical utilization equipment shall be designed and installed in accordance with the requirements for Class I, Division 1 or 2 classified locations, as set forth in Table 7 and in NFPA 70, *National Electrical Code*.

7-3.5 Where methyl alcohol-based windshield washer fluids are stored, handled, or dispensed into motor vehicles, electrical wiring and electrical utilization equipment shall be designed and installed in accordance with NFPA 70, *National Electrical Code*, for general purpose (nonclassified) locations.

7-3.6 Where Class II or Class III liquids are stored, handled, or dispensed, electrical wiring and electrical utilization equipment and wiring shall be permitted to be installed in accordance with NFPA 70, *National Electrical Code*, for general purpose (nonclassified) locations.

Table 7 Electrical Equipment Classified Areas — Service Stations

Location	NEC Class I, Group D Division	Extent of Classified Area ¹
Underground Tank Fill Opening	1	Any pit, box, or space below grade level, any part of which is within the Division 1 or 2 classified.
	2	Up to 18 in. above grade level within a horizontal radius of 10 ft from a loose fill connection and within a horizontal radius of 5 ft from a tight fill connection.
Vent — Discharging Upward	1	Within 3 ft of open end of vent, extending in all directions.
	2	Area between 3 ft and 5 ft of open end of vent, extending in all directions.
Dispensing Device ^{2,3} (except overhead type) ⁴		
Pits	1	Any pit, box, or space below grade level, any part of which is within the Division 1 or 2 classified area.
Dispenser	2	Within 18 in. horizontally in all directions extending to grade from (1) the dispenser enclosure or (2) that portion of the dispenser enclosure containing liquid handling components. ³
Outdoor	2	Up to 18 in. above grade level within 20 ft horizontally of any edge of enclosure.
Indoor with Mechanical Ventilation	2	Up to 18 in. above grade or floor level within 20 ft horizontally of any edge of enclosure.
Indoor with Gravity Ventilation	2	Up to 18 in. above grade or floor level within 25 ft horizontally of any edge of enclosure.
Dispensing Device — Overhead Type ^{3,4}	1	The area within the dispenser enclosure, and all electrical equipment integral with the dispensing hose or nozzle.
	2	An area extending 18 in. horizontally in all directions beyond the enclosure and extending to grade.
	2	Up to 18 in. above grade level within 20 ft horizontally measured from a point vertically below the edge of any dispenser enclosure.
Remote Pump — Outdoor	1	Any pit, box, or space below grade level if any part is within a horizontal distance of 10 ft from any edge of pump.
	2	Within 3 ft of any edge of pump, extending in all directions. Also up to 18 in. above grade level within 10 ft horizontally from any edge of pump.
Remote Pump — Indoor	1	Entire area within any pit.
	2	Within 5 ft of any edge of pump, extending in all directions. Also up to 3 ft above floor or grade level within 25 ft horizontally from any edge of pump.
Lubrication or Service Room — with Dispensing	1	Any pit within any unventilated area.
	2	Any pit with ventilation.
	2	Area up to 18 in. above floor or grade level and 3 ft horizontally from a lubrication pit.
Dispenser for Class I Liquids ³	2	Within 3 ft of any fill or dispensing point, extending in all directions.
	2	Entire area within any pit used for lubrication or similar services where class I liquids may be released.
Lubrication or Service Room — without Dispensing	2	Area up to 18 in. above any such pit and extending a distance of 3 ft horizontally from any edge of the pit.
	2	Entire unventilated area within any pit, below-grade area, or sub-floor area.
	2	Area up to 18 in. above any such unventilated pit, below-grade work area, or sub-floor work area and extending a distance of 3 ft horizontally from the edge of any such pit, below-grade work area, or sub-floor work area.
	Nonclassified	Any pit, below-grade work area, or sub-floor work area that is ventilated in accordance with 5-1.3.
Special Enclosure Inside Building Per 2-2	1	Entire enclosure.
Sales, Storage, and Rest Rooms	Nonclassified	If there is any opening to these rooms within the extent of a Division 1 area, the entire room shall be classified as Division 1.

Table 7 Electrical Equipment Classified Areas — Service Stations (Continued)

Location	NEC Class I, Group D Division	Extent of Classified Area ¹
Vapor Processing Systems Pits	1	Any pit, box, or space below grade level, any part of which is within Division 1 or 2 classified area or that houses any equipment used to transport or process vapors.
Vapor Processing Equipment Located within Protective Enclosures (see 4-5.7)	2	Within any protective enclosure housing vapor processing equipment.
Vapor Processing Equipment Not within Protective Enclosures (excluding piping and combustion devices)	2	The space within 18 in. in all directions of equipment containing flammable vapors or liquid extending to grade level. Up to 18 in. above grade level within 10 ft horizontally of the vapor processing equipment.
Equipment Enclosures	1	Any area within the enclosure where vapor or liquid is present under normal operating conditions.
	2	The entire area within the enclosure other than Division 1.
Vacuum-Assist Blowers	2	The space within 18 in. in all directions extending to grade level. Up to 18 in. above grade level within 10 ft horizontally.

For SI Units: 1 in. = 2.5 cm; 1 ft = 0.30 m.

¹For marine application the term “grade level” shall mean the surface of a pier, extending down to water level.

²Refer to Figure 7-1 for an illustration of classified areas around dispensing devices.

³Area classification inside the dispenser enclosure is covered in ANSI/UL 87, *Power Operated Dispensing Devices for Petroleum Products*.

⁴Ceiling-mounted hose reel.

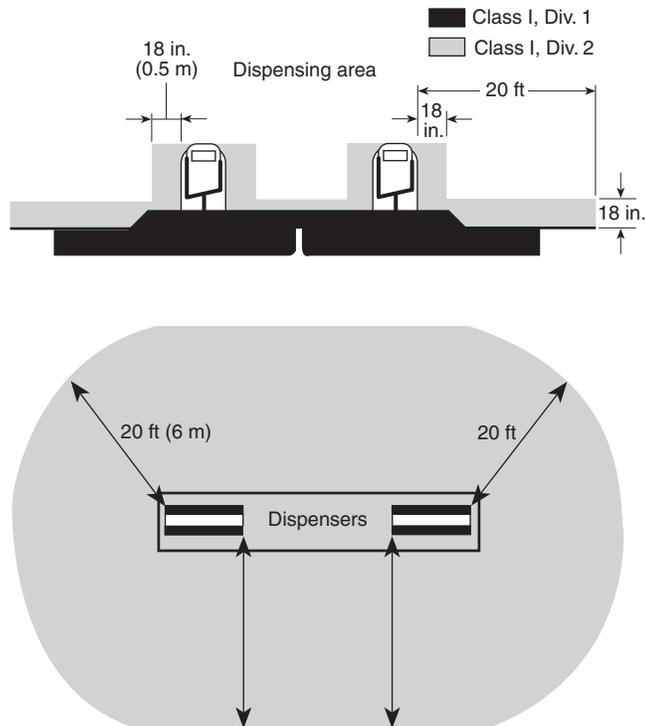


Figure 7-1 Classified areas adjacent to dispensers as detailed in Table 7.

Chapter 8 Heat-Producing Appliances

8-1 Heat-producing appliances shall be installed as provided in Sections 8-2 through 8-6.

8-2 Heat-producing appliances shall be permitted to be installed in the conventional manner except as provided in Sections 8-3, 8-4, 8-5, or 8-6.

8-3 Heat-producing appliances shall be permitted to be installed in a special room that is separated from an area that is classified as Division 1 or Division 2, in accordance with Table 7, by walls that are constructed so as to prevent the transmission of vapors, that have a fire resistance rating of at least 1 hr, and that have no openings in the walls within 8 ft (2.4 m) of the floor that lead to a classified area. Specific small openings through the wall, such as for piping and electrical conduit, shall be permitted, provided the gaps and voids are filled with a fire-resistant material to resist transmission of vapors. This room shall not be used for storage of combustible material. All air for combustion purposes shall be taken from outside the building.

8-4 Heat-producing appliances using gas or oil fuel shall be permitted to be installed in the lubrication or service room where there is no dispensing or transferring of Class I liquids, including the open draining of automotive gasoline tanks, provided the bottom of the combustion chamber is at least 18 in. (46 cm) above the floor and the heat-producing appliances are protected from physical damage.

8-4.1 Solid fuel stoves shall not be permitted in any lubrication room or service room.

8-5 Heat-producing appliances using gas or oil fuel listed for use in garages shall be permitted to be installed in the lubrication or service room where Class I liquids are dispensed or transferred, provided the equipment is installed at least 8 ft (2.4 m) above the floor.

8-6 Electrical heat-producing appliances shall conform to Chapter 7.

Chapter 9 Operational Requirements

9-1 Fuel Delivery Nozzles.

9-1.1 A listed automatic-closing type hose nozzle valve, with or without latch-open device, shall be provided for the dispensing of motor fuels.

9-1.2 If a hose nozzle valve is provided with a latch-open device other than recommended by the valve manufacturer, the latch-open device shall be an integral part of the valve assembly, and such valve latch-open device combination shall meet the applicable requirements of UL 842, *Standard for Valves for Flammable Fluids*. (See also 9-4.4.)

9-1.2.1 At any installation where the normal flow of product may be stopped other than by the hose nozzle valve, such as at pre-pay stations, the system shall include listed equipment with a feature that causes or requires the closing of the hose nozzle valve before product flow can be resumed or before the hose nozzle valve can be replaced in its normal position in the dispenser; or the hose nozzle valve shall not be equipped with a latch-open device.

9-1.3 Overhead-type dispensing devices shall be provided with a listed automatic-closing type hose nozzle valve without a latch-open device.

Exception: A listed automatic-closing type hose nozzle valve with latch-open device shall be permitted to be used if the design of the system is such that the hose nozzle valve will close automatically in the event the valve is released from a fill opening or upon impact with a driveway.

9-1.4 Dispensing nozzles used at marine service stations shall be of the automatic-closing type without a latch-open device.

9-1.5 A hose nozzle valve used to dispense a liquid into a container shall be manually held open during the dispensing operation.

9-2 Dispensing into Portable Containers. No delivery of any Class I or Class II liquid shall be made into portable containers unless the container is constructed of metal or is approved by the authority having jurisdiction, has a tight closure, and is fitted with a spout or so designed that the contents can be poured without spilling. (See NFPA 30, *Flammable and Combustible Liquids Code*, 4-2.1, for further information.)

9-2.1 No sale or purchase of any Class I, Class II, or Class III liquids shall be made in containers unless such containers are clearly marked with the name of the product contained therein.

9-2.2 Portable containers of 12 gal (45 L) capacity or less shall not be filled while they are in or on a motor vehicle or marine craft.

9-3 Attendance or Supervision of Dispensing.

9-3.1 Each service station shall have an attendant or supervisor on duty whenever the station is open for business, who shall dispense liquids into fuel tanks or into containers, except as covered in Sections 9-4 and 9-5.

9-3.2 Listed self-service dispensing devices are permitted at service stations provided that all dispensing of Class I liquids by a person other than the service station attendant is under the supervision and control of an attendant.

Exception: See Section 9-5.

9-3.3 The provisions of 2-1.1 shall not prohibit the temporary use of movable tanks in conjunction with the dispensing of flammable or combustible liquids into the fuel tanks of motor vehicles or other motorized equipment on premises not normally accessible to the public. Such installations shall only be made with the approval of the authority having jurisdiction. The approval shall include a definite time limit.

9-3.4 The provisions of 2-1.1 shall not prohibit the dispensing of Class I and Class II liquids in the open from a tank vehicle to a motor vehicle located at commercial, industrial, governmental, or manufacturing establishments and intended for fueling vehicles used in connection with their businesses. Such dispensing shall be permitted provided:

(a) An inspection of the premises and operations has been made and approval granted by the authority having jurisdiction.

(b) The tank vehicle complies with the requirements covered in NFPA 385, *Standard for Tank Vehicles for Flammable and Combustible Liquids*.

(c) The dispensing hose does not exceed 50 ft (15 m) in length.

(d) The dispensing nozzle is a listed automatic-closing type without a latch-open device.

(e) Nighttime deliveries shall only be made in adequately lighted areas.

(f) The tank vehicle flasher lights shall be in operation while dispensing.

(g) Fuel expansion space shall be left in each fuel tank to prevent overflow in the event of temperature increase.

9-3.5 The provisions of 2-1.1 shall not prohibit the dispensing of Class I and Class II liquids in the open from a fuel dispensing system supplied by an existing aboveground tank, not to exceed 6000 gal (22,710 L), located at commercial, industrial, governmental, or manufacturing establishments, and intended for fueling vehicles used in connection with their business. Such dispensing shall be permitted provided:

(a) An inspection of the premises and operations has been made and approval granted by the authority having jurisdiction.

(b) The tank is safeguarded against collision, spillage, and overflow to the satisfaction of the authority having jurisdiction.

(c) The tank system is listed or approved for such above-ground use.

(d) The tank complies with requirements for emergency relief venting, the tank and dispensing system meet the electrical classification requirements of this code, and the tank complies with the provisions of 2-1.7.

(e) The tank storage shall comply with NFPA 30, *Flammable and Combustible Liquids Code*, Chapter 2.

9-4 Attended Self-Service Stations.

9-4.1 Self-service station shall mean that portion of property where liquids used as motor fuels are stored and subsequently dispensed from fixed approved dispensing equipment into the fuel tanks of motor vehicles by persons other than the service station attendant and shall include facilities available for sale of other retail products.

9-4.2 Listed dispensing devices such as, but not limited to, coin-operated, card-operated, and remote-controlled types shall be permitted at self-service stations.

9-4.3 All attended self-service stations shall have at least one attendant on duty while the station is open for business. The attendant's primary function shall be to supervise, observe, and control the dispensing of Class I liquids while said liquids are actually being dispensed.

9-4.4 It shall be the responsibility of the attendant to (1) prevent the dispensing of Class I liquids into portable containers not in compliance with Section 9-2, (2) prevent the use of hose nozzle valve latch-open devices that do not comply with 9-1.2, (3) control sources of ignition, and (4) immediately activate emergency controls and handle accidental spills and fire extinguishers if needed. The attendant or supervisor on duty shall be mentally and physically capable of performing the functions and assuming the responsibility prescribed in this section.

9-4.5 Emergency controls specified in 4-1.2 shall be installed at a location acceptable to the authority having jurisdiction, but controls shall not be more than 100 ft (30 m) from dispensers.

9-4.6 Operating instructions shall be conspicuously posted in the dispensing area.

9-4.7 The dispensing area shall at all times be in clear view of the attendant, and the placing or allowing of any obstacle to come between the dispensing area and the attendant control area shall be prohibited. The attendant shall at all times be able to communicate with persons in the dispensing area.

9-5 Unattended Self-Service Stations.

9-5.1 Unattended self-service shall be permitted, subject to the approval of the authority having jurisdiction.

9-5.2 Listed dispensing devices shall be used. Coin- and currency-type devices shall only be permitted with the approval of the authority having jurisdiction.

9-5.3 Emergency controls specified in 4-1.2 shall be installed at a location acceptable to the authority having jurisdiction, but the controls shall be more than 20 ft (7 m) but less than 100 ft (30 m) from the dispensers. Additional emergency controls shall be installed on each group of dispensers or the outdoor equipment used to control the dispensers. Emergency controls shall shut off power to all dispensing devices at the station. Controls shall be manually reset only in a manner approved by the authority having jurisdiction.

9-5.4 Operating instructions shall be conspicuously posted in the dispensing area and shall include location of emergency controls and a requirement that the user shall stay outside of his/her vehicle, in view of the fueling nozzle during dispensing.

9-5.5 In addition to those warning signs specified in Section 9-9, emergency instructions shall be conspicuously posted in the dispenser area incorporating the following or equivalent wording:

Emergency Instructions

In case of fire or spill:

1. Use emergency stop button.
2. Report accident by calling (specify local fire number) on the phone. Report location.

9-5.6 A listed, automatic-closing-type hose nozzle valve with latch-open device shall be provided. The system shall include listed equipment with a feature that causes or requires the closing of the hose nozzle valve before the product flow can be resumed or before the hose nozzle valve can be replaced in its normal position in the dispenser.

9-5.7 A telephone or other approved, clearly identified means to notify the fire department shall be provided on the site in a location approved by the authority having jurisdiction.

9-5.8 Additional fire protection shall be provided where required by the authority having jurisdiction. Additional fire protection considerations include such items as fixed suppression systems, automatic fire detection, manual fire alarm stations, transmission of alarms to off-site locations, and limiting gallonage delivered per transaction.

9-6 Drainage and Waste Disposal.

9-6.1 Provision shall be made in the area where Class I liquids are dispensed to prevent spilled liquids from flowing into the interior of service station buildings. Such provision shall be made by grading driveways, raising door sills, or other equally effective means.

9-6.2 Crankcase drainings and liquids shall not be dumped into sewers, streams, or upon the ground, but shall be stored in approved tanks or containers outside any building, or in tanks installed in accordance with Chapters 2 and 3 of this code, until removed from the premises. (See 2-3.4.)

9-7 Sources of Ignition. In addition to the previously stated restrictions of this chapter, smoking materials, including matches and lighters, shall not be used within 20 ft (6 m) of areas used for fueling, servicing fuel systems for internal combustion engines, or receiving or dispensing of Class I liquids. Conspicuous and legible signs prohibiting smoking shall be posted within sight of the customer being served. The motors of all equipment being fueled shall be shut off during the fueling operation except for emergency generators, pumps, etc., where continuing operation is essential.

9-8 Fire Control. Each service station shall be provided with one or more listed fire extinguishers that have a minimum capability of 40-B:C. They shall be located so that an extinguisher will be within 100 ft (30 m) of each pump, dispenser, underground fill pipe opening, and lubrication or service room.

9-8.1 Where required, automatic fire suppression systems shall be installed in accordance with appropriate NFPA standards, manufacturers' instructions, and the listing requirements of the systems. (See Chapter 11 for referenced publications.)

9-9 Signs. Warning signs shall be conspicuously posted in the dispensing area incorporating the following or equivalent wording: (a) WARNING — It is unlawful and dangerous to dispense gasoline into unapproved containers, (b) No Smoking, and (c) Stop Motor.

Chapter 10 Marine Service Stations

10-1 Scope.

10-1.1 This chapter shall apply to that portion of a property where liquids used as fuels are stored, handled, and dispensed from equipment located on shore, or from equipment located on piers, wharves, or floating docks into the fuel tanks of marine craft, including incidental activity, except as covered elsewhere in this code or in other NFPA standards.

10-1.2 This chapter shall not apply to:

- (a) Bulk plant or terminal, loading and unloading facilities;
- (b) Transferring flammable or combustible liquids utilizing a flange-to-flange closed transfer piping system;
- (c) Marine service stations where liquids used as fuels are stored and dispensed into the fuel tanks of marine craft of 300 gross tons (849 m³) or more.

10-1.3 For the purpose of this chapter, the word "pier" shall also mean "dock," "floating dock," and "wharf."

10-2 Storage.

10-2.1 General Provisions.

10-2.1.1 Liquids shall be stored in:

- (a) Tanks located under ground as governed by Section 2-4 of NFPA 30, *Flammable and Combustible Liquids Code*, or
- (b) Tanks located above ground at marine service stations with the approval of the authority having jurisdiction and as provided for in Section 2-4.

10-2.1.2 Tanks supplying marine service stations and pumps not integral with the dispensing device shall be on shore or on a pier of the solid-fill type.

Exception: Where shore location would require excessively long supply lines to dispensers, tanks shall be permitted to be located on a pier, provided that applicable requirements of NFPA 30, *Flammable and Combustible Liquids Code*, Chapters 2 and 3, relative to spacing, diking, and piping, and Chapter 5, Table 5-9.5.3, relative to electrical classification, are met and the quantity so stored does not exceed 1100 gal (4164 L) aggregate capacity.

10-2.1.3 At marine service stations where a tank is at an elevation that produces a gravity head on the dispensing device, the tank outlet shall be equipped with a device (such as a normally closed solenoid valve) that will prevent gravity flow from the tank to the dispenser. 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.

10-3 Piping Systems.

10-3.1 Piping shall be located so as to be protected from physical damage.

10-3.1.1 All piping systems shall be substantially supported and protected against physical damage and stresses arising from impact, settlement, vibration, expansion, contraction, or tidal action.

10-3.1.2 A means shall be provided to ensure flexibility of the piping in event of motion of the pier. Flexible piping shall be of a type designed to withstand the forces and pressures exerted upon piping.

10-3.2 Suitable lengths of oil-resistant flexible hose shall be permitted to be employed between the shore piping and the piping on a floating structure to accommodate changes in water level or shoreline.

10-3.3 A readily accessible valve to shut off the liquid supply from shore shall be provided in each pipeline at or near the approach to the pier and at the shore end of each marine pipeline adjacent to the point where each flexible hose is attached.

10-3.4 Shutoff and check valves shall be equipped with a pressure-relieving device that will relieve any pressure generated by thermal expansion of the contained liquid back to the storage tank.

10-4 Fuel Dispensing Devices.

10-4.1 All hoses shall be listed. Where hose length at marine service stations exceeds 18 ft (5.5 m), the hose shall be secured so as to protect it from damage.

10-4.2 Dispensing nozzles used at marine service stations shall be of the automatic-closing type without a latch-open device.

10-4.3 Dispensing devices at marine service stations shall be permitted to be located on open piers, or on shore or on piers of the solid-fill type, and shall be located apart from other structures so as to provide room for safe ingress and egress of craft to be fueled.

10-4.4 Dispensing devices at marine service stations shall be located so as to minimize exposure to all other operational marina or pleasure boat berthing area facilities. Where tide and weather conditions permit, all liquid fuel handling shall be outside the main berthing areas. Inside marina or pleasure boat berthing areas, fueling facilities shall be so located that, in case of fire aboard a boat alongside, the danger to other boats near the facility will be minimal. No vessel or marine craft shall be made fast to or berthed at any fuel dispensing location except during fueling operations.

10-4.5 No vessel or marine craft shall be made fast to any other vessel or marine craft occupying a berth at a fuel dispensing location during fueling operations.

10-4.6 Apparatus dispensing Class I liquids into the fuel tanks of marine craft of the public shall not be located at a bulk plant unless separated by a fence or similar barrier from the area in which bulk operations are conducted. Aboveground tanks located at a bulk plant shall not be connected by piping to marine service station tanks.

10-4.7 Each marine service station shall have an attendant or supervisor on duty whenever the station is open for business. The attendant's primary function shall be to supervise, observe, and control the dispensing of liquids.

10-5 [RESERVED]

10-6 Sources of Ignition.

10-6.1 All electrical components for dispensing liquids shall be installed in accordance with Chapter 7.

(a) All electrical equipment shall be installed and used in accordance with the requirements of NFPA 70, *National Electrical Code*, as it applies to wet, damp, and hazardous locations.

(b) Clearly identified emergency switches readily accessible in case of fire or physical damage at any dispensing unit shall be provided on each marine wharf so interlocked as to shut off power to all pump motors from any individual location and to reset only from the master switch. Each such switch is to be identified by an approved sign stating "EMERGENCY PUMP SHUTOFF" in 2-in. (5-cm) red block capital letters.

(c) All electrical wiring for power and lighting shall be installed on the side of the marine wharf opposite from the liquid piping system.

(d) Smoking materials, including matches and lighters, shall not be used within 20 ft (6 m) of areas used for fueling, servicing fuel systems for internal combustion engines, or receiving or dispensing of Class I liquids. Conspicuous and legible signs prohibiting smoking shall be posted within sight of the customer being served. The motors of all equipment being fueled shall be shut off during the fueling operation, except for emergency generators, pumps, etc., where continuing operation is essential.

10-7 Grounding/Bonding.

10-7.1 Where excessive stray currents are encountered, piping handling Class I and Class II liquids at marine service stations shall be electrically isolated from the shore piping.

10-7.2 Pipelines on piers shall be adequately bonded and grounded. Bonding and grounding connections on all pipelines shall be located on the pier side of hose riser insulating flanges, if used, and shall be accessible for inspection. (NFPA

77, *Recommended Practice on Static Electricity*, contains information on this subject.)

10-7.3 The fuel delivery nozzle shall be put into contact with the vessel fill pipe before the flow of fuel shall commence and this bonding contact shall be continuously maintained until fuel flow has stopped to avoid possibility of electrostatic discharge.

10-8 Fire Control.

10-8.1 Each marine service station shall be provided with one or more listed fire extinguishers having a minimum classification of 40-B:C located so that an extinguisher will be within 100 ft (30 m) of each pump, dispenser, and pier-mounted liquid storage tank.

10-8.2 Piers that extend more than 500 ft (152 m) in travel distance from shore shall have a Class III standpipe installed in accordance with NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*.

10-8.3 Materials shall not be placed on a pier in such a manner as to obstruct access to fire-fighting equipment or important piping system control valves. Where the pier is accessible to vehicular traffic, an unobstructed roadway to the shore end of the wharf shall be maintained for access by fire-fighting apparatus.

10-9 Portable Tanks and Containers.

10-9.1 The provisions of 2-1.1 shall not prohibit the temporary use of movable tanks in conjunction with the dispensing of flammable or combustible liquids into the fuel tanks of marine craft on premises not normally accessible to the public. Such installations shall only be made with the approval of the authority having jurisdiction.

10-9.2 No delivery of any Class I or Class II liquid shall be made into portable containers unless the container is constructed of metal or is approved by the authority having jurisdiction, has a tight closure, and is fitted with a spout or is so designed that the contents can be dispensed without spilling. (See NFPA 30, *Flammable and Combustible Liquids Code*, 4-2.1, for further information.)

10-9.3 Portable containers of 12 gal (45 L) capacity or less shall not be filled while they are in or on a marine craft.

10-10 Cargo Tank Fueling Facilities.

10-10.1 The provisions of 10-2.1.1 shall not prohibit the dispensing of Class II liquids in the open from a tank vehicle to a marine craft located at commercial, industrial, governmental, or manufacturing establishments when the liquid is intended for fueling marine craft used in connection with their businesses. Such dispensing shall be permitted provided:

(a) An inspection of the premises and operations has been made and approval granted by the authority having jurisdiction.

(b) The tank vehicle complies with the requirements of NFPA 385, *Standard for Tank Vehicles for Flammable and Combustible Liquids*.

(c) The dispensing hose does not exceed 50 ft (15 m) in length.

(d) The dispensing nozzle is a listed automatic-closing type without a latch open device.

(e) Nighttime deliveries shall only be made in adequately lighted areas.

(f) The tank vehicle flasher lights shall be in operation while dispensing.

(g) Fuel expansion space shall be left in each fuel tank to prevent overflow in the event of temperature increase in accordance with 10-11.5.

10-11 General.

10-11.1 It shall be the responsibility of the attendant to (1) prevent the dispensing of Class I liquids into portable containers not in compliance with Section 9-2; (2) be familiar with the dispensing mechanism and emergency shutoff controls; (3) ensure that the vessel is properly moored and that all connections are made; (4) be within 15 ft (4.6 m) of such dispensing controls during the fueling operation and maintain a direct clear unobstructed view of both the vessel fuel filler neck and the fueling facility emergency fuel shutoff mechanism.

10-11.2 Fueling shall not be undertaken at night except under well-lighted conditions.

10-11.3 During fueling operations smoking shall be forbidden on board the boat or vessel and on the dispensing site.

10-11.4 Before opening the tanks of the vessel to be fueled, the following precautions shall be taken:

(a) All engines, motors, fans, and bilge blowers shall be shut down.

(b) All open flames and smoking material shall be extinguished and all exposed heating elements shall be turned off.

(c) Galley stoves shall be extinguished.

(d) All ports, windows, doors, and hatches shall be closed.

10-11.5 After the flow of fuel has stopped:

(a) The fill cap shall be tightly secured.

(b) Any spillage shall be wiped up immediately.

(c) If Class I liquid has been delivered, the entire vessel shall remain opened and bilge blowers turned on and allowed to run for at least 5 minutes before starting any engines or lighting galley fires. If bilge blowers are not available, an additional 5 minutes of ventilation shall be required.

10-11.6 No Class I liquids shall be delivered to any vessel having its tanks located below deck unless each tank is equipped with a separate fill pipe, the receiving end of which shall be securely connected to a deck plate and fitted with a screw cap. Such pipe shall extend to and into the tank. Vessels receiving Class II or Class IIIA combustible liquids shall have the receiving end of the fill pipe securely connected to a deck plate and fitted with a screw cap. Such pipe shall be permitted to connect to a manifold fuel fill system that shall extend to and into each separate tank. Each tank shall be provided with a suitable vent pipe that shall extend from the tank to the outside of the coaming or enclosed rails so that the vapors will dissipate outboard.

10-11.7 Vessel owners or operators shall not offer their craft for fueling unless;

(a) The tanks being filled are properly vented to dissipate vapors to the outside atmosphere and the fuel systems are liquidtight and vaportight with respect to all interiors.

(b) All fuel systems are designed, installed, and maintained in compliance with the specifications of the manufacturer of the vessel.

(c) Communication has been established between the fueling attendant and the person in control of the vessel receiving the fuel so as to determine the vessel's fuel capacity, the amount of fuel on board, and the amount of fuel to be taken on board.

(d) The electrical bonding and grounding systems of the vessel have been maintained in accordance with the specifications of its manufacturer.

10-11.8 A suitable sign with the following legends printed in 2-in. (5-cm) red block capital letters on a white background shall be conspicuously posted at the dispensing area of all marine service stations:

BEFORE FUELING:

(a) Stop all engines and auxiliaries.

(b) Shut off all electricity, open flames, and heat sources.

(c) Check all bilges for fuel vapors.

(d) Extinguish all smoking materials.

(e) Close access fittings and openings that could allow fuel vapors to enter enclosed spaces of the vessel.

DURING FUELING:

(a) Maintain nozzle contact with fill pipe.

(b) Wipe up spills immediately.

(c) Avoid overfilling.

(d) Fuel filling nozzle must be attended at all times.

AFTER FUELING:

(a) Inspect bilges for leakage and fuel odors.

(b) Ventilate until odors are removed.

Chapter 11 Referenced Publications

11-1 The following documents or portions thereof are referenced within this code and shall be considered part of the requirements of this document. The edition indicated for each reference is the current edition as of the date of the NFPA issuance of this document.

11-1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, 1996 edition.

NFPA 30, *Flammable and Combustible Liquids Code*, 1996 edition.

NFPA 70, *National Electrical Code*, 1996 edition.

NFPA 80, *Standard for Fire Doors and Fire Windows*, 1995 edition.

NFPA 88B, *Standard for Repair Garages*, 1991 edition.

NFPA 90A, *Standard for the Installation of Air Conditioning and Ventilating Systems*, 1996 edition.

NFPA 91, *Standard for Exhaust Systems for Air Conveying of Materials*, 1995 edition.

NFPA 101, *Life Safety Code*, 1994 edition.

NFPA 302, *Fire Protection Standard for Pleasure and Commercial Motor Craft*, 1994 edition.