

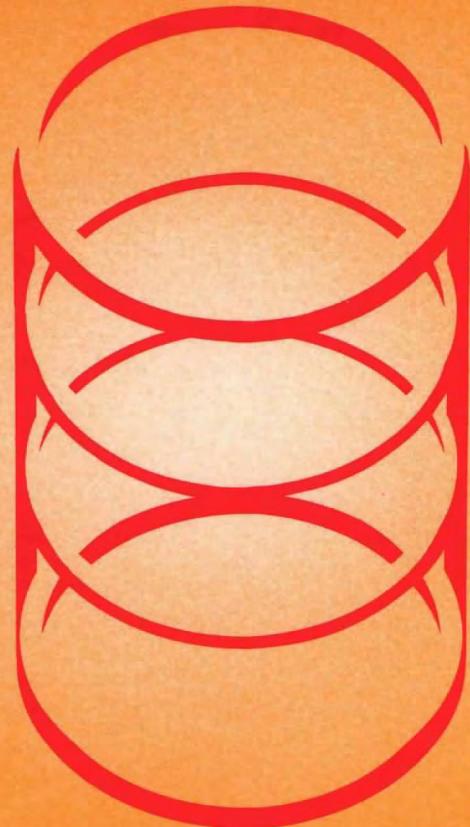
NFPA 30A

Automotive and Marine Service Station Code

1990 Edition

ANSI/NFPA 30A

An American National Standard
August 17, 1990



National Fire Protection Association

1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101

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There is a concern that the growing use of synthetic materials may produce more or additional toxic products of combustion in a fire environment. The Board has, therefore, asked all NFPA technical committees to review the documents for which they are responsible to be sure that the documents respond to this current concern. To assist the committees in meeting this request, the Board has appointed an advisory committee to provide specific guidance to the technical committees on questions relating to assessing the hazards of the products of combustion.

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Errata Issued

1 NFPA 30A-1990

Automotive and Marine Service Station Code
Reference: 2-1.1(e) and 2-2.1

The Automotive and Marine Service Stations Committee notes the following errors in the 1990 edition of *Automotive and Marine Service Station Code*, NFPA 30A:

1. In 2-1.1(e), the correct cross-reference is to NFPA 30, Section 2-4.
2. In 2-2.1, the correct cross-reference is to NFPA 30, Section 2-4.

2 NFPA 30A-1990

Automotive and Marine Service Station Code
Reference: 2-3.4

The Committee on Automotive and Marine Service Stations notes the following error in the 1990 edition of NFPA 30A, *Automotive and Marine Service Station Code*.

1. In 2-3.4, the correct references to applicable sections of NFPA 30-1990, *Flammable and Combustible Liquids Code*, are Sections 2-2 and 4-2.

Errata Issued

3 NFPA 30A

Automotive and Marine Service Station Code
Reference: Table 7

The Committee on Automotive and Marine Service Stations notes the following error in the 1990 edition of NFPA 30A, *Automotive and Marine Service Station Code*.

1. In Table 7, for the entry for "Lubrication or Service Room - without Dispensing", the reference to 6-1.3 is not correct. The correct reference is 5-1.3.

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NFPA 30A

Automotive and Marine Service Station Code

1990 Edition

This edition of NFPA 30A, *Automotive and Marine Service Station Code*, was prepared by the Technical Committee on Automotive and Marine Service Stations, released by the Correlating Committee on Flammable Liquids, and acted on by the National Fire Protection Association, Inc. at its Annual Meeting held May 21-24, 1990 in San Antonio, TX. It was issued by the Standards Council on July 20, 1990, with an effective date of August 17, 1990, and supersedes all previous editions.

The 1990 edition of this document has been approved by the American National Standards Institute.

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.

Origin and Development of NFPA 30A

Prior to 1984, the fire protection requirements for service stations were contained in Chapter 7 of NFPA 30, *Flammable and Combustible Liquids Code*. In 1984, the Committee on Flammable and Combustible Liquids produced the first edition of NFPA 30A. The Committee's reasons for producing a separate code on service stations were to provide more detailed requirements for service stations, to anticipate the possible need to address alternate fuels, and to allow the complete revision of NFPA 30 into a more performance-oriented document that would not contain occupancy-specific requirements. A second edition, in 1987, recognized unattended self-service stations.

This third edition contains the following major amendments:

- The scope has been amended to exempt refueling facilities for large, off-road vehicles.
- Statements of retroactivity and equivalency have been added.
- Provisions have been added to Chapter 2, and a new Chapter 5 has been added to allow storage of Class IIIB liquids in tanks in below-grade areas, thus providing requirements for lubrication-only service facilities.
- Provisions have been added to Chapter 4 to ensure that no maintenance is performed on dispensing devices until the area has been secured and electrical power to the pump has been disconnected.
- Classification of areas for electrical equipment has been clarified.

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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.

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

Information on referenced publications can be found in Chapter 10 and Appendix B.

Foreword

This standard, known as the *Automotive and Marine Service Station Code*, is recommended for use as the basis of 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 standard does not eliminate all hazard 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 applies to automotive and marine service stations and to service stations located inside buildings.

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.

Approved. Acceptable to the "authority having jurisdiction."

NOTE: The National Fire Protection Association does not approve, inspect or certify any installations, procedures, equipment, or materials nor does it approve or evaluate testing laboratories. In determining the acceptability of installations or procedures, equipment or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization concerned with product evaluations which is in a position to determine compliance with appropriate standards for the current production of listed items.

Authority Having Jurisdiction. The "authority having jurisdiction" is the organization, office or individual responsible for "approving" equipment, an installation or a procedure.

NOTE: The phrase "authority having jurisdiction" is used in NFPA documents in a broad manner since jurisdictions and "approval" agencies vary as do their responsibilities. Where public safety is primary, the "authority having jurisdiction" may be a federal, state, local or other regional department or individual such as a fire chief, fire marshal, chief of a fire prevention bureau, labor department, health department, building official, electrical inspector, or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the "authority having jurisdiction." In many circumstances the property owner or his designated agent assumes the role of the "authority having jurisdiction"; at government installations, the commanding officer or departmental official may be the "authority having jurisdiction."

Basement. A story of a building or structure having $\frac{1}{2}$ 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).

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

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).

Labeled. Equipment or materials to which has been attached a label, symbol or other identifying mark of an organization 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 or materials included in a list published by an organization acceptable to the "authority having jurisdiction" and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

NOTE: The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. The "authority having jurisdiction" should utilize the system employed by the listing organization to identify a listed product.

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 fixed 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, or

- (b) Tanks in special enclosures inside buildings as described in Section 2-2, or
- (c) Aboveground tanks supplying marine service stations as provided in 2-1.6, or
- (d) An approved tank that is part of a fuel dispensing system as provided for in 9-3.5, or
- (e) Tanks located underground as in Section 2-3 of NFPA 30, *Flammable and Combustible Liquids Code*, or
- (f) Tanks or containers inside service station buildings as provided for in 2-3.3 and 2-3.4.

2-1.2 Vent pipes on tanks storing gasoline shall be in accordance with NFPA 30, *Flammable and Combustible Liquids Code*, Paragraphs 2-3.5.1, 2-3.5.2, and 2-3.5.6, 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 a service station.

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 separate pump(s) or dispenser(s) for any product, the reconciliation shall be maintained separately for each tank system. API Publication 1621, *Recommended Practice for Bulk Liquid Stock Control at Retail Outlets*, provides information on this subject.

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, the authority having jurisdiction may authorize the installation of tanks 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 5-3.5.3, relative to electrical classification, are complied with and the quantity so stored does not exceed 1,100 gal (4164 L) aggregate capacity.

(b) Shore tanks supplying marine service stations may be located aboveground where rock ledges or high water tables make underground tanks impractical.

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 2-2.7.1 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 When installation of tanks in accordance with NFPA 30, *Flammable and Combustible Liquids Code*, Section 2-3 is impractical because of property or building limitations, tanks for liquids may be installed in buildings if enclosed as described in 2-2.2 and upon specific approval of the authority having jurisdiction.

2-2.2 Enclosure shall be substantially liquid- 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 containing Class I liquids installed in accordance with 2-2.2 shall not exceed 6,000 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 is permitted.

2-3.2 Class I liquids may be transferred from one container to another in lubrication or service rooms of a service station building provided the electrical installation complies with Table 7 and provided that any heating equipment complies with Chapter 8. See also 9-6 for other possible sources of ignition.

2-3.3 Class II and Class IIIA liquids may 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 2-1 and 4-2 of NFPA 30, *Flammable and Combustible Liquids Code*, as applicable, inside service station buildings. Unless otherwise proven by test, 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.

Chapter 3 Piping, Valves, and Fittings

3-1 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 may be employed between the shore piping and the piping on the floating structure as made necessary by change in water level or shoreline.

3-2 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 Piping shall be located so as to be protected from physical damage.

3-4 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 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 min at the maximum operating pressure of the system.

3-6* 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.

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 may 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.

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 may 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 Hose length at service stations shall not exceed 18 ft (5.5 m) unless approved by the authority having jurisdiction. All hose shall be listed. When not in use, hose shall be so secured 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 may 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 device and pump serving the dispenser 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. When an outside pump location is impractical, pumps may 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 listed rigidly anchored emergency shutoff valve, incorporating a fusible link or other thermally actuated device, designed to close automatically in event of severe impact or fire exposure shall be installed in accordance with the manufacturer's instructions in the supply line at the base of each individual island-type dispenser or at the inlet of each overhead dispensing device. 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 may 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 may 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 Table 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 Table 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 sq ft (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 is 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 1½-hr (B) fire doors. Doors shall be self-closing or may 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 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.

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 sq ft (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 the Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying*.

6-3.6 The provisions of 6-3.2, 6-3.3, 6-3.4, and 6-3.5 do not apply to a service station located inside a building if 2 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 NFPA 30, *Flammable and Combustible Liquids Code*, Chapter 3.

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. Vertical 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 may 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 Chapter 7 shall apply to areas where Class I liquids are stored, handled, or dispensed. For areas where Class II or Class III liquids are stored, handled, or dispensed, the electrical equipment may be installed in accordance with the provisions of NFPA 70, *National Electrical Code*®, for nonclassified locations.

7-2 All electrical equipment and wiring shall be of a type specified by and shall be installed in accordance with NFPA 70, *National Electrical Code*. All electrical equipment integral with the dispensing hose or nozzle shall be suitable for use in Division 1 locations.

7-3 Table 7 shall be used to delineate and classify areas for the purpose of installation of electrical equipment under normal circumstances. In designating a classified area, a classified area shall not extend beyond a solid floor, wall, roof, or other partition that has no communicating openings. The designation of classes and divisions is defined in Chapter 5, Article 500, of NFPA 70, *National Electrical Code*.

7-4 The area classifications listed 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 have the authority to determine the extent of the classified area.

Table 7 Electrical Equipment Classified Areas — Service Stations

Location	NEC Class I, Group D Division	Extent of Classified Area**
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 (except overhead type)* Pits	1	Any pit, box, or space below grade level, any part of which is within the Division 1 or 2 classified area.
Dispenser		NOTE: Area classification inside the dispenser enclosure is covered in ANSI/UL 87, <i>Power Operated Dispensing Devices for Petroleum Products</i> .

con't

Table 7 (con't)

Location	NEC Class I, Group D Division	Extent of Classified Area**
Outdoor	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. Area classification inside the dispenser enclosure is covered in ANSI/UL 87, <i>Power Operated Dispensing Devices for Petroleum Products</i> .
Indoor	2	Up to 18 in. above grade level within 20 ft horizontally of any edge of enclosure.
with Mechanical Ventilation	2	Up to 18 in. above grade or floor level within 20 ft horizontally of any edge of enclosure.
with Gravity Ventilation	2	Up to 18 in. above grade or floor level within 25 ft horizontally of any edge of enclosure.
Dispensing Device ¹ Overhead Type*	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.
Dispenser for Class I Liquids	2	Area up to 18 in. above floor or grade level and 3 ft horizontally from a lubrication pit.
	2	Within 3 ft of any fill or dispensing point, extending in all directions.
Lubrication or Service Room - without Dispensing	2	Entire area within any pit used for lubrication or similar services where class I liquids may be released.
	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 6-1.3.
Special Enclosure Inside Building Per 2-2 Sales, Storage, and Rest Rooms	1	Entire enclosure.
Vapor Processing Systems Pits	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.
	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 Pro- tective Enclosures (excluding piping and com- bustion 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.
Vacuum-Assist Blowers	2	The entire area within the enclosure other than Division 1.
	2	The space within 18 in. in all directions extending to grade level. Up to 18 in. above grade level within 10 ft horizontally.

^{*}Ceiling mounted hose reel.

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

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

**For marine application the term "grade level" shall mean the surface of a pier, extending down to water level.

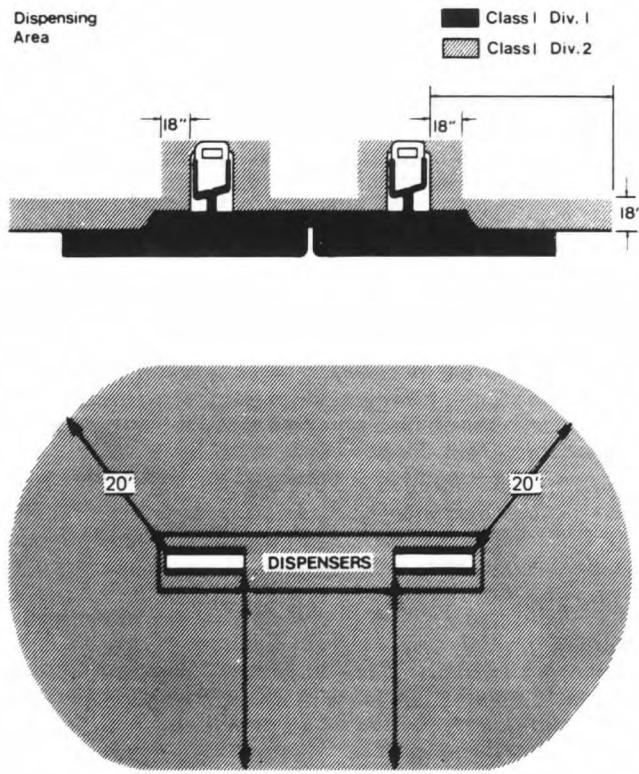


Figure 7-1 Classified areas adjacent to dispensers as detailed in Table 7.

Chapter 8 Heating Equipment

8-1 Heating equipment shall be installed as provided in 8-2 through 8-6.

8-2 Heating equipment may be installed in the conventional manner except as provided in 8-3, 8-4, 8-5, or 8-6.

8-3 Heating equipment 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 Heating equipment using gas or oil fuel may 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 heating equipment is protected from physical damage.

8-5 Heating equipment using gas or oil fuel listed for use in garages may 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 heating equipment 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 on island-type dispensers used for the dispensing of Class I liquids.

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 conform to the applicable requirements of Section 19A of UL 842, *Standard for Valves for Flammable Fluids*.

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 may 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 for dispensing Class I liquids 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*, Section 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 shall not be filled while located inside the trunk or passenger compartment of a vehicle.

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 a qualified 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 enforcing authority. 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 may 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 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 may 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 overfill to the satisfaction of the authority having jurisdiction.

(c) The tank system is listed or approved for such aboveground use.

(d) The tank complies with requirements for emergency relief venting, the tank and dispensing system meet the electrical classification requirements of the *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 may 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 are 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 feet (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 must 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 9-9.1, 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 may 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 pro-

vision may 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 previous restrictions of this chapter, the following shall apply: There shall be no smoking or open flames in the 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 having a minimum classification of 40B:C 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.

9-9 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 Referenced Publications

10-1 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.

10-1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 30-1990, *Flammable and Combustible Liquids Code*

NFPA 70-1990, *National Electrical Code*®

NFPA 80-1990, *Standard for Fire Doors and Windows*

NFPA 88B-1985, *Standard for Repair Garages*

NFPA 90A-1989, *Standard for the Installation of Air Conditioning and Ventilating Systems*

NFPA 91-1990, *Standard for the Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying*

NFPA 101-1988, *Life Safety Code*®

NFPA 302-1989, *Fire Protection Standard for Pleasure and Commercial Motor Craft*

NFPA 303-1990, *Fire Protection Standard for Marinas and Boatyards*

NFPA 385-1990, *Standard for Tank Vehicles for Flammable and Combustible Liquids*

10-1.2 Other Publications.

10-1.2.1 UL Publication. Underwriters Laboratories Incorporated, 333 Pfingsten Road, Northbrook, IL 60062.

UL 842-1987, *Standard for Valves for Flammable Fluids*

Appendix A

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

A-3-6 Where fill pipes for Class II or Class IIIA liquids are located in the same immediate area with fill pipes for Class I liquids, consideration should be given to providing positive means such as different pipe sizes, connection devices, special locks, or other methods designed to prevent the erroneous transfer of Class I liquids into or from any container or tank used for Class II or Class IIIA liquids.

Appendix B Referenced Publications

B-1 The following documents or portions thereof are referenced within this standard for informational purposes only and thus are not 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.

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

NFPA 52-1988, *Standard for Compressed Natural Gas (CNG) Vehicular Fuel Systems*

NFPA 58-1989, *Standard for the Storage and Handling of Liquefied Petroleum Gases*

Flammable and Combustible Liquids Code Handbook

B-1.2 Other Publications.

B-1.2.1 API Publication. American Petroleum Institute, 1220 L Street, NW, Washington, DC 20005.

Recommended Practice for Bulk Liquid Stock Control at Retail Outlets

B-1.2.2 UL Publication. Underwriters Laboratories Incorporated, 333 Pfingsten Road, Northbrook, IL 60002.

ANSI/UL 87, *Power Operated Dispensing Devices for Petroleum Products*

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Tentative Interim Amendment

NFPA 30A

Automotive and Marine Service Station Code

1990 Edition

Reference: 1-2, 2-1.1, and 2-4
T.I.A. 90-1

Pursuant to Section 15 of the NFPA Regulations Governing Committee Projects, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 30A, *Automotive and Marine Service Station Code*, 1990 edition. The TIA was processed by the Automotive and Marine Service Stations Committee and was issued by the Standards Council on April 11, 1991.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a Proposal of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards making process.

1. Add the following definition to Section 1-2:

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

2. Replace the current 2-1.1(d) with the following:

(d) Aboveground storage tanks may be installed at automotive service stations upon the approval of the authority having jurisdiction and as provided for in 2-4, or

3. Add new Section 2-4 as follows:

2-4 Aboveground Storage Tanks at Automotive Service Stations.

2-4.1 Except as modified by the provisions of this section, aboveground storage tanks and their piping systems shall comply with the applicable provisions of 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.

(Continued)

2-4.2 Tank Location and Capacity.

2-4.2.1 Tanks storing Class I and II liquids at an individual site shall be limited to a maximum individual capacity of 12,000 gal and an aggregate capacity of 40,000 gal.

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;
- (d) 100 ft (30 m) from any property line that is or can be built upon, including the opposite side of a public way.

Exception No. 1: All distances may be reduced by 50 percent if tanks are installed in vaults that comply with 2-4.4.

Exception No. 2: No minimum distances shall be required for fuel dispensing systems that comply with 9-3.5.

2-4.3 Control of Spillage. Spill control shall be provided in accordance with 2-3.3 of NFPA 30, *Flammable and Combustible Liquids Code*.

Exception: Tanks in vaults that comply with 2-4.4 need not meet this requirement.

2-4.4 Vaults.

2-4.4.1 Definition. An enclosure, either above- or below-grade, that contains an above-ground storage tank and meets the requirements of 2-4.4.2.

2-4.4.2 Vaults may 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 shall be constructed of noncombustible material. The top and floor of the vault and the tank foundation shall be designed to withstand the anticipated loading. 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.
- (b) Each vault and its tank shall be suitably anchored to withstand uplifting by ground water or flooding, including when the tank is empty.
- (c) The 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 ventilation of each vault to dilute, disperse, and remove vapors prior to entering the vault.

(Continued)

(f) Each vault shall be equipped with a detection system that is capable of detecting liquids, including water, and that will activate an alarm.

(g) 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. Portable pumps shall be suitable for use in Class I, Division 1 locations, as defined by Article 500 of NFPA 70, *National Electrical Code*.

(h) Vent pipes that are provided for normal tank venting shall terminate outside the vault and at least 12 ft (3.6 m) above adjacent ground level.

(i) 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 secure against unauthorized entry and vandalism.

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

(k) 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 by Article 500 of NFPA 70, *National Electrical Code*.

2-4.5 Piping and Ancillary Equipment.

2-4.5.1 Means shall be provided for determining the liquid level in each tank, and this means shall be accessible to the delivery operator. Provisions shall be made either to automatically stop the delivery of liquid to the tank when the liquid level in the tank reaches 98 percent of capacity or to sound an audible alarm when the liquid level in the tank reaches 95 percent of capacity.

2-4.5.2 Liquid shall not be dispensed from the tank by gravity flow or by pressurization of the tank. Means shall be provided to prevent the release of liquid by siphon flow.

2-4.5.3 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 2-3.7.1 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.

2-4.5.4 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.

2-4.5.5 If a suction pump-type dispensing device is used, a listed vacuum-actuated shutoff valve, with a shear section, or an equivalent-type valve shall be installed directly under each dispensing device.

Exception: Tanks installed in below-grade vaults need not comply with this requirement.

2-4.5.6 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.

2-4.5.7 Piping shall be routed so that exposure to physical damage is minimized.

(Continued)

2-4.6 Physical Protection.

2-4.6.1 Tanks that are 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 properly secured against unauthorized entry. Aboveground tanks shall be protected against vehicular collision by suitable 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.

2-4.6.2 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.

2-4.7 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.

2-4.8 Tank Filling Operations.

2-4.8.1 Delivery operations shall comply with applicable requirements of NFPA 385, *Standard for Tank Vehicles for Flammable and Combustible Liquids*, and with the requirements of 2-4.8.2 through 2-4.8.5.

2-4.8.2 The delivery vehicle shall be separated from any aboveground tank by at least 25 ft (7.6 m).

2-4.8.3 Tank filling shall not begin until the delivery operator has determined tank ullage (available capacity).

2-4.8.4 A check valve and a shutoff valve with a quick-connect coupling or a dry-break valve shall be installed in the piping at a point where connection and disconnection is made for delivery from the vehicle to any aboveground tank. This device shall be protected from tampering and physical damage.

2-4.8.5 If the delivery hose is connected directly to the tank, the fill line at the tank shall be equipped with a tight-fill device for connecting the hose to the tank to prevent or contain any spill at the fill opening during delivery operations.

Exception: A tank that has a capacity that does not exceed 1,000 gal need not meet this requirement.