REGISTERED No. M - 302
L.-7646

The Gazette of Pakistan

EXTRAORDINARY
PUBLISHED BY AUTHORITY

ISLAMABAD, FRIDAY, JULY 3, 2009

PART II

Statutory Notifications (S.R.O)

GOVERNMENT OF PAKISTAN

OIL AND GAS REGULATORY AUTHORITY

NOTIFICATION

Islamabad, the 2nd July, 2009

S.R.O. 623(I)/2009.-In exercise of the powers conferred by Section 42 of Oil and Gas Regulatory Authority Ordinance, 2002 (Ordinance XVII of 2002) the Oil and Gas Regulatory Authority is pleased to make the following regulations namely:-

1. Short title and Commencement:- (1) These Regulations may be called the Technical Standards for the Petroleum Industry (Retail Outlets)

(2) They shall, come into force at once.

2. Applicability:- These regulations shall be applicable to all premises for the distribution of petroleum products owned or operated by an oil marketing company or its dealer for the purpose of selling petroleum products to automotive vehicles.

CHAPTER 1 - GLOSSARY

3. Definition of General terms

3.1 In this Standard the following terms shall have the meaning ascribed thereto below:

3.1.1 “Air Gap” means A minimum of 1 inch (25.4 mm) free air space provided between the planes of Division 1 or Division 2 hazardous locations and an unclassified area of a dispensing device.

3.1.2 “Basement” means a storey 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.

3.1.3 “Building” includes occupied buildings where egress within 2 minutes cannot be reasonably expected, and control buildings that require presence of personnel for orderly shutdown of important or hazardous processes, unprotected storage areas where products from fire can harm the community or the environment, or buildings that contain high-value contents or critical equipment or supplies.

3.1.4 “Bulk Plant or Terminal” means that portion of a property where liquids are received by tank trucks, tank wagons or pipeline and are stored or blended in bulk for the purpose of distributing such liquids by tank trucks, tank wagons, pipeline, portable tank, or container.

3.1.5 “Closed Container” means a container as herein defined, so sealed by means of a lid or other device that neither liquid nor vapour will escape from it at ambient temperature.

3.1.6 “CNG” means Compressed Natural Gas.

3.1.7 “Combustible Liquid” means see Regulation 3.1.22

3.1.8 “Container” means any vessel of 60 U.S. gal (227 L) or less capacity used for transporting or storing liquids.

3.1.9 “Dispenser, Remote-Control Type” means a dispensing device that does not contain a power-operated pump as part of the assembly, and which is intended for connection to a fluid piping system containing the power operated pumps at a remote location. Also commonly identified as a “dispenser.”

3.1.10 “Dispenser, Self-Contained” means a dispensing device that includes a power operated pump as part of the assembly. Also commonly identified as a “pump” or “suction dispenser.

3.1.11 “Dispensing Device” means a product consisting of a meter, motor, or fluid control, and an area for storing a hose nozzle valve with or without a pump.

3.1.12 “Dispensing Device, Overhead Type” means a dispensing device that consists of one or more individual units intended for installation in conjunction with each other, mounted above a Fuel Dispensing Area typically within the service station canopy structure, and characterized by the use of an overhead hose reel. This definition applies to an overhead dispenser that uses a retractable hose on an overhead reel.

3.1.13 “Flammable Liquid” as defined in Regulation 3.1.21

3.1.14 “Fleet Vehicle Motor Fuel Dispensing Facility” means a motor fuel dispensing facility at a commercial, industrial, governmental, or manufacturing property where motor fuels are dispensed into the fuel tanks of motor vehicles that are used in connection with the business or operation of that property by persons engaged for such business or operation.

3.1.15 “Fuel Dispensing Area” means area for dispensing of fuel, typical within the service station canopy structure, and includes the area within the pump boundaries within which all dispensing activities are conducted.

3.1.16 “Fuel Dispensing System” means a complete dispensing system comprising of Dispensing Device along with its associated piping and pumping system.

3.1.17 “Gas” means a material that has a vapour pressure greater than 300 kPa absolute (41.5 psia) at 50°C (122°F) or is completely gaseous at 20°C (68°F) at a standard pressure of 101.3 kPa absolute (14.7 psia).

3.1.18 “Housing” means that section of the device that encloses and is intended to protect operating parts, control mechanisms, or other mechanical or electrical components, the damage of which would render the device incapable of being operated as intended, lead to tampering, introduce the possibility of escape of liquid, or expose bare live electrical parts.

3.1.19 “IBCs” means Intermediate Bulk Containers.

3.1.20 “Liquid” means any material that has fluidity greater than that of 300 penetration asphalt when tested in accordance with ASTM D5, Standard Test Method for Penetration of Bituminous Materials, When not otherwise identified, the term liquid mean both flammable and combustible liquids.

3.1.21 “Flammable Liquid” means any liquid that has a closed-cup flash point below 100°F (37.8°C), as determined by the test procedures and apparatus set forth in ASTM D 56, ASTM D 93, ASTM D 3278 and ASTM D 3278. Flammable liquids are classified as Class I Liquids as follows:

3.1.21.1 Class I Liquid: Any liquid that has a closed-up flash point below 100°F (37.8°C) and a Reid vapour pressure not exceeding 40 psia (2068.6 mm Hg) at 100°F (37.8°C). Class I Liquids are further classified as follows:

3.1.21.1.1 Class IA Liquids shall include those liquids that have flash points below 73°F (22.8°C) and boiling points below 100°F (37.8°C);

3.1.21.1.2 Class IB Liquids shall include those liquids that have flash points below 73°F (22.8°C) and boiling points at or above 100°F (37.8°C);

3.1.21.1.3 Class IC Liquids shall include those liquids that have flash points at or above 73°F (22.8°C), but below 100°F (37.8°C).

3.1.22 "Combustible Liquid" means any liquid that has a closed-cup flash point at or above 100°F (37.8°C), as determined by the test procedures set forth in ASTM D 56, ASTM D 93, ASTM D 3278 and ASTM D 3278. Combustible liquids are classified as Class II or Class III as follows:

3.1.22.1 Class II Liquid: Any liquid that has a flash point at or above 100°F (37.8°C) and below 140°F (60°C)

3.1.22.2 Class IIIA Liquid: Any liquid that has a flash point at or above 140°F (60°C), but below 200°F (93°C)

3.1.22.3 Class IIIB Liquid: Any liquid that has a flash point at or above 200°F (93°C).

Table 1 (Typical Flammable and Combustible Liquids Found at Motor Fuel Dispensing Facilities)

[This table is not a part of the requirements of this standard but is included for informational purposes only. It lists common liquids typically found at motor fuel dispensing facilities and Repair Garages and their relevant fire hazard properties.]

Liquid	Flash Point (°F)	NFPA 30 Class	Boiling Point (°F)	Min. Ignition Temp. in Air (°F)
Antifreeze	230	IIIB	300	—
Brake fluid	300	IIIB	540	—
Chassis grease	400	IIIB	>800	>800
Crankcase drainings	—	IIIB	—	—
Diesel fuel #1	100	II	—	—
Diesel fuel #2	125	II	—	—
Diesel fuel #4	130	II	—	—
Gasoline	-40 to -50	IB	100 to 400	~825
Gear lubricant	395	IIIB	>800	>800
Kerosene (fuel oil #1)	100	II	304 to 574	440
Lithium-moly grease	380	IIIB	>800	>900
Lubricating oils	300 to 450	IIIB		
Power steering fluid	350	IIIB	>550	—
Transmission fluid				
Dexron II	395	IIIB	>800	>800
Type F	380	IIIB	>800	>800
White grease	465	IIIB	>800	>800
Windshield washer fluid (methanol/water mixtures)				
100% methanol	54	IB	148	725

50% methanol/50% water	80	IC	—
20% methanol/80% water	118	II	—
5% methanol / 95% water	206	IIIB	—

3.1.23 "Mobile Fuel Dispensing Facility" means a vehicle, tank truck, or other mobile device from which a flammable liquid used as motor fuel may be dispensed as an act of retail sale into the fuel tank of a motor vehicle parked on an off-street parking facility.

3.1.24 "Marine Motor Fuel Dispensing Facility" means a motor fuel dispensing facility at or adjacent to shore, a pier, a wharf, or a floating dock where motor fuels are dispensed into the fuel tanks of marine craft.

3.1.25 "Motor Fuel Dispensing Facility" means that portion of a property where motor fuels are stored and dispensed from fixed equipment into the fuel tanks of motor vehicles or marine craft or into containers, including all equipment used in connection therewith.

3.1.26 "Oily Water Separator" means equipment that separate oil from water. Designed in accordance with API 421, "Monographs on Refinery Environmental Control – Management of Water Discharges."

3.1.27 Repair Garages.

3.1.27.1 "Major repair Garage" A Building or portions of a Building where major repairs, such as, engine overhauls, painting, body and fender work, and repairs that require draining of the motor vehicle fuel tank, are performed on motor vehicles, including associated floor space used for offices, parking, or showrooms.

3.1.27.2 "Minor Repair Garage" A Building or portions of a Building used for lubrication, inspection, and minor automotive maintenance work, such as, engine tune-ups, replacement of parts, fluid changes (e.g., oil, antifreeze, transmission fluid, brake fluid, air conditioning refrigerants, etc.), brake system repairs, tire rotation, and similar routine maintenance work, including associated floor space used for offices, parking, or showrooms.

3.1.28 "Tanks" means and includes:

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

3.1.28.2 “Fire-Resistant Tank”, that is, an Aboveground Storage Tank that provides fire-resistive protection from exposures to a high-intensity liquid pool fire (See Regulation 6.3).

3.1.28.3 “Standpipe” is a riser portion of the system piping that delivers the water supply for hose connections, and sprinklers on combined systems, vertically from floor to floor.

3.1.28.4 “Portable Tank”, that is, any closed vessel having a liquid capacity over 60 Gal (227 L) and not intended for fixed installation, including IBCs, as defined and regulated by the U.S. Department of Transportation.

3.1.28.5 “Protected Aboveground Tank”, that is, an Aboveground Storage Tank that is in accordance with UL 2085, Standard for Insulated Aboveground Tanks for Flammable and Combustible Liquids, or an equivalent test procedure, that consists of a primary tank provided with protection from physical damage and fire-resistive protection from exposure to a high-intensity liquid pool fire.

3.1.28.6 “Fiberglass Reinforced Plastic Tank” shall comply with the applicable requirements of UL 1316, *Standard for Glass-Fiber-Reinforced Plastic. Underground Storage Tanks for Petroleum Products, Alcohols and Alcohol-Gasoline Mixtures.*

3.1.29 “Vapour Barrier” means a solid, un-pierced partition located between Division 1 or Division 2 hazardous locations and unclassified areas of a Dispensing Device. The vapour barrier is intended to reduce the entry of flammable gases or vapours into unclassified areas.

3.2 In this Standard the following terms of measurements have been used:

3.2.1 “°C” means Degree Celsius.

3.2.2 “cm” means Centimetre.

3.2.3 “°F” means Degree Fahrenheit.

3.2.4 “ft” means Feet.

3.2.5 “in.” means Inch.

3.2.6 “KPa” means Kilopascals.

3.2.7 “L” means Litres.

3.2.8 “m” means Meter.

3.2.9 “mm” means Millimetre.

3.2.10 “mm Hg” means Millimetres of Mercury.

3.2.11 “psia” means Pounds per square inch, absolute.

3.2.12 “psig” means Pounds per square inch, gauge.

3.2.13 “Gal” means US Gallons.

3.3 In this Technical Standard the following abbreviations refer to the institutions mentioned there against:

3.3.1 “ANSI” refers to the American National Standards Institute.

3.3.2 “API” refers to the American Petroleum Institute.

3.3.3 “ASME” refers to the American Society for Mechanical Engineers.

3.3.4 “ASTM” refers to the American Society for Testing and Materials.

3.3.5 “IEC” refers to the International Electrical Commission.

3.3.6 “ISO” refers to the International Standards Organisation.

3.3.7 “NACE” refers to the National Association of Corrosion Engineers.

3.3.8 “NFPA” refers to the National Fire Protection Association.

3.3.9 “STI” refers to the Steel Tank Institute.

3.3.10 “UL” refers to the Underwriters Laboratories.

3.3.11 “ULC” refers to the Underwriters Laboratories of Canada.

3.3.12 Hazardous Area” Locations in which flammable gases or vapours are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures

CHAPTER 1 - SCOPE

4. Scope of this Standard

4.1 These Standards prescribe guidelines and requirements for the design, materials, construction and lay outing of motor fuel dispensing facilities. These Standards also include facilities for the storage of liquids, piping systems, fuel dispensing systems, building construction requirements, operational requirements, electrical installations and marine fueling systems.

4.2 Notwithstanding anything contained in these Standards, the various provisions of these Standards specified in Appendix 2 hereto shall not apply to existing Motor Vehicle Fuel Dispensing Facilities until the time mentioned in that Appendix against the provisions specified therein.

4.3 These Standards are not applicable to bulk plants and terminals for the storage of petroleum products. This standard is not applicable to retail outlets used for the LPG.

CHAPTER 3 - STORAGE OF LIQUIDS

5. Scope and General Requirements

5.1 Scope

This chapter shall apply to the storage of Liquids which are used or dispensed as fuels and to the storage of related materials, such as lubricating oils, greases and cleaning solvents.

5.2 Liquids may be stored in the following:

5.2.1 Closed containers not exceeding 60 Gal (227 L) capacity, provided they are located outside buildings.

5.2.2 Tanks or closed containers located inside Motor Fuel Dispensing Facilities or Repair Garages.

5.2.3 Aboveground tanks, underground tanks, and containers in accordance with the requirements of Regulation 5.3.

5.2.4 Tanks supplying marine service stations in accordance with Regulation 18.2.

5.3 A Motor Fuel Dispensing Facility located at a bulk plant shall be separated from areas in which bulk plant operations are conducted by a fence or other suitable barrier. Dispensing Devices at Motor Fuel Dispensing Facility shall not be supplied by Aboveground Tanks located in the bulk plant. Tanks at Motor Fuel Dispensing Facilities shall not be connected by piping to Aboveground Tanks located in the bulk plant.

5.4 Where Tanks are at an elevation that produces a gravity head on the Dispensing Device, the outlet from such Tank shall be equipped with a device, such as, a closed solenoid valve, an internal flow valve, or an external flow valve, located as close as practical to the shell of the Tank. This device shall be installed and adjusted so that Liquid cannot flow by gravity from the Tank if the piping or hose fails when the dispenser is not in use.

6. Storage of Liquids

6.1 Underground Tanks

Only underground storage tanks shall be used for the storage of Liquids at Motor Fuel Dispensing Facilities.

6.1.1 Installation of Underground Tanks

6.1.1.1 Location

Excavation for underground storage Tanks shall be made with due care to avoid undermining of foundations of existing structures. Underground storage Tanks shall be so located with respect to existing building foundations and supports that the loads carried by such foundations and supports cannot be transmitted to the tank. The distance from any part of a Tank storing Class I Liquids to the nearest wall of any basement or pit shall not be less than 1 ft (0.3 m), and to any property line that can be built upon, not less than 3 ft (0.9 m). The distance from any part of a Tank storing Class II Liquids or Class III Liquids to the nearest wall of any basement, pit, or property line shall not be less than 1 ft (0.3 m). Pits with RCC floor and all around RCC wall shall be provided for underground tanks, with fine sand padding of 300 mm on top and bottom of the tanks.

6.1.1.2 Burial Depth and Cover

6.1.1.2.1 All underground storage tanks shall be installed in accordance with the manufacturer's/designer's instructions, where available, and shall be set on firm foundations, surrounded with at least 6in (15cm) of non-corrosive inert material, such as, clean sand or gravel well tampered in place.

6.1.1.2.2 Underground storage Tanks shall be covered with not less than 2 ft (0.6 m) of earth, or with not less than 1 ft (0.3 m) of earth on top of which shall be placed a slab of reinforced concrete not less than 4 in. (10 cm) thick. Where they are, or likely to be subjected to traffic, they shall be protected against damage from vehicles passing over them by at least 3 ft (0.9m) of earth cover, or 18 in. (450 mm) of well-stamped earth plus either 6 in. (150 mm) of reinforced concrete or 8 in. (200 mm) of asphaltic concrete. When asphaltic or reinforced concrete paving is used as part of the protection, it shall extend at least 1 ft (0.3 m) horizontally beyond the outline of the tank in all directions.

6.1.1.2.3 Maximum depth of cover shall be specified by the Tank designer and marked on the Tank. When the depth of cover is greater than the diameter of the Tank or if the pressure at the bottom of the Tank can exceed 10 psig (69 Kpa), the designer of the Tank shall be consulted to determine if reinforcement of the Tank is required. The specific gravity of the Liquids to be stored shall be a design factor.

6.1.1.3 Installation Standards

The following standards should also be under this regulation:

a) API RP 1615, Installation of Underground Petroleum Storage System.

b) NFPA 30, Flammable and Combustible Liquids Code.

c) UL 58, Standard for Steel Underground Tanks for Flammable and Combustible Liquids.

d) UL-1316: Std. for Glass Fibre Reinforced Plastic underground Storage Tanks for Petroleum Products.

e) ASTM – D4021-86: Std. Specification for glass – Fibre – reinforced Polyester Underground petroleum Storage Tanks.

6.1.1.4 Vent Piping for Underground Tanks

6.1.1.4.1 Vent pipes from underground storage Tanks storing Class I Liquids shall be located so that the discharge point is outside of buildings, higher than the fill pipe opening, and not less than 12 ft (3.6 m) above the adjacent ground level. Vent pipe outlets shall be located and directed so that vapours will not accumulate or travel to an unsafe location, enter building openings, or be trapped under eaves, and shall be at least 5 ft (1.5 m) from building openings and at least 15 ft (4.5 m) from powered ventilation air intake devices.

6.1.1.4.2 Vent pipes shall not be obstructed by devices provided for vapour recovery or other purposes unless the Tank and associated piping and equipment are otherwise protected to limit back-pressure development to less than the maximum working pressure of the Tank and of the equipment by the provision of pressure-vacuum vents, rupture discs, or other tank-venting devices installed in the vent lines for such Tank. Vent outlets and devices shall be protected to minimize the possibility of blockage from weather, dirt, insects, birds' nests.

6.1.1.4.3 Tank venting systems shall be provided with sufficient capacity to prevent blowback of vapour or liquid at the fill opening while the Tank is being filled. Vent pipes shall be sized in accordance with Table 2, but shall in no event be less than 1.25 in. (32 mm) nominal inside diameter.

Table 2 (Vent Line Diameters)

Maximum Flow (gpm)	Pipe Length*		
	50 ft (in.)	100 ft (in.)	200 ft (in.)
100	1¼	1¼	1¼
200	1¼	1¼	1¼
300	1¼	1¼	1½
400	1¼	1½	2
500	1½	1½	2
600	1½	2	2
700	2	2	2
800	2	2	3
900	2	2	3
1000	2	2	3

For SI units, 1 in. = 25 mm; 1 ft = 0.3 m; 1 gal = 3.8 L. *Vent lines of 50 ft, 100 ft, and 200 ft of pipe plus 7 ells.

6.1.1.4.4 Where tank venting devices are installed in vent lines, their flow capacities shall be determined as follows:

6.1.1.4.4.1 Each underground tank-venting device shall have stamped on it the start-to-open pressure, the pressure at which the valve reaches the full open position, and the flow capacity at the latter pressure. If the start-to-open pressure is less than 2.5 psig (gauge pressure of 17.2 kPa) and the pressure at the full open position is greater than 2.5 psig (gauge pressure of 17.2 kPa), the flow capacity at 2.5 psig (gauge pressure of 17.2 kPa) shall also be stamped on the venting device. The flow capacity shall be expressed in cubic feet per hour of air at 60°F (15.6°C) and 14.7 psia (760 mm Hg).

6.1.1.4.4.2 The flow capacity of tank venting devices shall be calculated as per the requirement of API 2000, *Standard for Venting Atmospheric and Low-Pressure Storage Tanks.*

6.1.1.4.5 Vent pipes from Tanks storing Class II Liquids or Class IIIA Liquids shall terminate outside of

the building and higher than the fill pipe opening. Vent outlets shall be above normal snow level. They shall be fitted with return bends, coarse screens, or other devices to minimize ingress of foreign material.

6.1.1.4.6 Vent pipes shall be installed without sags or traps in which liquid can collect.

6.1.1.4.7 Where tank vent piping is manifolded, pipe sizes shall be such as to discharge, within the pressure limitations of the system, the vapours they may be required to handle when manifolded tanks are filled simultaneously. Float-type check valves installed in tank openings connected to manifolded vent piping to prevent product contamination may be used provided that tank pressure will not exceed 10 psig (69 Kpa) when the valves close.

6.1.1.4.8 Vent piping for tanks storing Class I Liquids shall not be manifolded with vent piping for Tanks storing Class II Liquids or Class III Liquids unless positive means are provided to prevent the following:

6.1.1.4.8.1 Vapours of Class I Liquids from entering tanks storing Class II Liquids or Class III Liquids.

6.1.1.4.8.2 Contamination: Requirements for the safe storage and use of a great variety of Flammable Liquids and Combustible Liquids commonly available, depend primarily on their fire characteristics, particularly the flash point, which is the basis for the classification system given in Regulation 4.1.22. Classification of Liquids may change due to contamination. For example, placing a Class II Liquid into a Tank that last contained a Class I Liquid may change the flash point of the Class II Liquid such that it falls into the range of a Class I Liquid. The same situation may exist where a Class II Liquid is exposed to the vapours of a Class I Liquid via an interconnecting vapour line. Care should therefore be exercised in such cases to apply the requirements appropriate to the actual classification of the Liquid being stored.

6.1.1.4.8.3 Possible change in classification of the less volatile Liquids.

6.1.1.5 Tank Openings Other than Vents for Underground Tanks

6.1.1.5.1 Connections for all tank openings shall be liquid -tight.

6.1.1.5.2 Openings for manual gauging, if independent of the fill pipe, shall be provided with a liquid-tight cap or cover. Covers shall be kept closed when not gauging.

6.1.1.5.3 Fill and discharge lines shall enter Tanks only through the top. Fill lines shall be sloped toward the Tank. Underground storage Tanks for Class I Liquids having a capacity of more than 1000 Gal (3785 L) shall be equipped with a tight fill device for connecting the fill hose to the Tank.

6.1.1.5.4 Fill pipes that enter the top of a Tank shall terminate within 6 in. (150 mm) of the bottom of the Tank. Fill pipes shall be installed or arranged so that vibration is minimized.

6.1.1.5.5 Fill pipes in Tanks whose vapour space under the expected range of normal operating conditions is not in the flammable range or is inerted need not meet the requirement mentioned in Regulation 6.1.1.5.4.

6.1.1.5.6 Fill pipes in Tanks handling Liquids with minimal potential for accumulation of static electricity need not meet the requirement mentioned in Regulation 6.1.1.5.4; provided that the fill line is designed and the system is operated to avoid mist generation, and an adequate level of residence time is provided downstream of filters or screens such that the charge generated is dissipated.

6.1.1.5.7 Filling and emptying connections for Class I Liquids, Class II Liquids, or Class IIIA Liquids that are connected and disconnected shall be

located outside of buildings at a location free from any source of ignition and not less than 5 ft (1.5 m) away from any building opening. Such connections shall be closed and liquid-

tight when not in use and shall be properly identified.

6.1.2 Prevention Of Overfilling Of Tanks

An underground storage Tank shall be equipped with overfill prevention system or procedure that will:

6.1.2.1 Automatically shut off the flow of liquid into the Tank when the Tank is no more than 95% (ninety-five percent) full; or

6.1.2.2 Alert the transfer operator when the Tank is no more than 90% (ninety percent) full by restricting the flow of liquid into the Tank or triggering a high-level alarm; or

6.1.2.3 Enable the transfer operator to stop the tank filling when the Tank is no more than 95% (ninety-five percent) full. For this purpose, the operator shall check the initial liquid level of the Tank to be filled with a dip gauge and shall estimate the required quantity to allow in the desired Tank, before the Tank filling operation starts. The operator will then take a number of readings at suitable intervals and cease the transfer process when the level of liquid in the Tank reaches the 95% (ninety-five percent) limit.

6.1.3 Piping

Underground piping systems shall be protected against corrosion by using non corrosive material, protective coatings or cathodic protection systems.

6.1.4 Design of Storage Tank System Corrosion Protection

Metal used to fabricate the tank shall be thick enough to compensate for internal and external corrosion expected during the design life of the tank or other means of corrosion protection shall be provided.

6.1.4.1 External Corrosion Protection for Underground Tanks

Underground tanks and their piping shall be protected by either of the following:

6.1.4.1.1 A properly engineered, installed, and maintained cathodic protection system in accordance with the following recognized standards of design:

(a) API RP 1632, Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems; or

(b) ULC-S603.1 M, Standard for Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids; or

(c) STI-P3, Specification and Manual for External Corrosion Protection of Underground Steel Storage Tanks; or

(d) NACE Standard RP-0169, Recommended Practice, Control of External Corrosion of Underground or Submerged Metallic Piping Systems; or

(e) NACE Standard RP-0285, Recommended Practice, Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems; or

(f) UL 1746, Standard for External Corrosion Protection Systems for Steel Underground Storage Tanks, Part 1; or

(g) STI RP 892, Recommended Practice for Corrosion of Underground Piping Networks Associated with Liquid Storage and Dispensing Systems.

6.1.4.1.2 Suitable corrosion-resistant materials or systems.

6.1.4.2 Internal Corrosion Protection for All Tanks

Where Tanks are not designed in accordance with Regulation 6.1.4, or with standards of the American Petroleum Institute, American Society of Mechanical Engineers, or the Underwriters Laboratories Inc. or if corrosion is anticipated beyond that provided for in the design formulas or standards used, additional metal thickness or suitable protective coatings or linings shall be provided to compensate for the corrosion loss expected during the design life of the tank.

6.1.5 Glass-Fiber-Reinforced Plastic Underground Storage Tanks

Fiberglass reinforced plastic tanks shall comply with the applicable requirements in the Standard for Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures, UL 1316.

6.2 Aboveground Storage Tanks

6.2.1 The use of Aboveground Storage Tanks at Fleet Vehicle Motor Fuel Dispensing Facilities and Marine Motor Fuel Dispensing Facilities shall be permitted when installed in accordance with the requirements of this regulation 6.2.

6.2.2 Tanks designed and built for underground use shall not be installed for aboveground use.

6.2.3 Tanks storing Class I Liquids or Class II Liquids at an individual site shall be limited to a maximum individual capacity of 12,000 Gal (45,400 L) and aggregate capacity of 48,000 Gal (181,700 L).

6.2.4 Tanks shall be located in accordance with Table 3.

6.2.5 The maximum individual tank capacity of 12,000 Gal (45,400 L), where indicated in Table 3, shall be permitted to be increased to 20,000 Gal (75,700 L) for Class II Liquids and Class III Liquids at a Fleet Vehicle Motor Fuel Dispensing Facility.

6.2.6 At Fleet Vehicle Motor Fuel Dispensing Facilities, no minimum separation shall be required between the Dispensing Device and a Protected Tank, or a Fire-Resistant Tank.

Table 3 (Minimum Separation Requirements for Aboveground Storage Tanks)

Tank Type	Individual Tank Capacity (gal) *(see Regulation 6.2.3 and 6.2.5)*	Minimum Distance from the Nearest Important Building on the Same Property (ft)	Minimum Distance from Nearest Fuel Dispensing Device (ft) *(see Regulation 6.2.6)*	Minimum Distance from Lot Line That Is or Can Be Built Upon, Including the Opposite Side of a Public Way (ft)	Distance from the Nearest Side of Any Public Way (ft)	Minimum Distance Between Tanks (ft)
Protected Aboveground Storage Tanks	Less than or equal to 6,000	5	25	15	5	3
	6,001 to 12,000	15	25	25	15	3
Fire-Resistant Tanks	0 to 12,000	25	25	50	25	3
Other Tanks meeting the requirements of NFPA 30	0 to 12,000	50	50	100	50	3

For SI Units 1 in = 25.4mm , 1 ft = 0.3048m, 1gal = 3.78 litres

6.2.7 The provisions of this regulation shall not prohibit the dispensing of Class I Liquids or Class II Liquids in the open from a fuel dispensing system supplied by an existing Aboveground Storage Tank, not to exceed 6,000 Gal (22,710 L), located at commercial, industrial, governmental, or manufacturing establishments, and intended for fuelling vehicles used in connection with their business. Such dispensing shall be permitted subject to the following:

6.2.7.1 The Tank is safeguarded against collision, spillage, and overfill to the satisfaction of the Authority having Jurisdiction.

6.2.7.2 The Tank system is approved for such aboveground use.

6.2.8 Aboveground Storage Tanks shall be provided with spill control that meets the requirements of NFPA 30, Flammable and Combustible Liquids Code, Control of Spills from Aboveground Tanks. Tank fill connections shall be provided with a non-combustible spill containment device.

6.3 Fire-Resistant Tanks

An above ground atmospheric tank provides with 2-hrs. fire resistive protection that limits the temperature rise to the primary tank when exposed to a high intensity liquid pool fire.

Fire-resistant tanks shall meet all of the following requirements:

6.3.1 The construction that provides the required fire-resistive protection 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 2080, *Standard for Fire Resistant Tanks for Flammable and Combustible Liquids*, or equivalent test procedure.

6.3.2 The following formula, for total emergency relief venting capacity for any specific stable liquid can be used:

$$\text{ft}^3 \text{ of free air per hour} = \frac{V\ 1337}{L\ (M)^{1/2}}$$

where V = ft^3 of free air per hour
L = Latent heat of vaporization of specific liquid (Btu/lb)
M = Molecular weight of specific liquids

6.4 Protected Tanks

An above ground atmospheric tank with secondary containment and an insulation system intended to reduce heat transfer to primary tank when the

tank is exposed to a hydrocarbon pool fire and provided with protection from physical damage.

Protected Tanks shall be tested in accordance with UL 2085, *Standard for Insulated Aboveground Tanks for Flammable and Combustible Liquids*. Protected Tanks shall also meet the requirements of Regulation 6.4.1 and Regulation 6.3.2.

6.4.1 The construction that provides the required fire-resistive protection 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 and shall limit the increase in temperature of the Liquid inside the Tank when tested using the fire exposure specified in UL 2085, *Standard for Insulated Aboveground Tanks for Flammable and Combustible Liquids*.

6.5 Additional Requirements for all Aboveground Storage Tanks

6.5.1 All openings shall be located above the maximum liquid level.

6.5.2 Provision shall be made for determining the liquid level in each Tank and the meter, dial or other means provided for reading or recording the liquid level in the Tank shall be accessible to the delivery operator.

6.5.3 Provision shall be made for the sounding of an audible alarm when the liquid level in the Tank reaches 90% (ninety percent) of capacity. Provision shall also be made so that either the flow of Liquid into the Tank automatically stops when the liquid level in the Tank reaches 98% (ninety-eight percent) capacity or the flow of Liquid into the Tank is restricted to a maximum flow rate of 2.5 gpm (9.5 L/min) when the Liquid in the Tank reaches 95% (ninety-five percent) capacity. These provisions shall not restrict or interfere with the operation of either the normal vent or the emergency vent.

6.5.4 Provision shall be made to prevent the release of Liquid by siphon flow.

6.5.5 Where a Tank is at an elevation that produces a gravity head on the Dispensing Device, shall meet the requirements of regulation 5.4.

6.5.6 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.

6.5.7 Liquid fuel shall not be dispensed from the Tank by either gravity flow or pressurization of the Tank.

6.6 Physical Protection for All Outside Aboveground Storage Tanks

6.6.1 Tanks shall be enclosed with a chain link fence at least 6 ft (1.8 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.

Tanks are not required to be enclosed with a fence if the property on which the Tanks are located has a perimeter security fence.

6.6.2 Guard posts or other means shall be provided to protect Tanks that are subject to vehicular damage. When guard posts are installed, the following design shall be acceptable:

6.6.2.1 guard posts shall be constructed of steel not less than 4 in. (100 mm) in diameter and shall be filled with concrete;

6.6.2.2 guard posts shall be spaced not more than 4 ft (1.2 m) on center; and

6.6.2.3 guard posts shall be set not less than 3 ft (0.9 m) deep in a concrete footing of not less than 15-in. (380-mm) diameter.

6.7 Corrosion Control

Any portion of a Tank or its piping that is in contact with the soil shall have properly engineered, installed, and maintained corrosion protection that meets the requirements of 6.1.4.1.1, Flammable and Combustible Liquids Code.

6.8 Storage of Liquids Inside Buildings

Storage of Flammable Liquids and Combustible Liquids in Motor Fuel Dispensing Facility buildings shall meet the requirements of this regulation.

6.8.1 Class I Liquids, Class II Liquids, and Class IIIA Liquids in Tanks Not Exceeding 120 Gal (454 L) Capacity and in Containers

6.8.1.1 The aggregate quantity of Class I Liquids which may be stored within a building shall not exceed in the case of a Tank, 120 Gal (454 L) capacity, and in the case of a container, 120 Gal (454 L). Liquids in storage shall be maintained in Tanks or in containers that are closed or are fitted with a Dispensing Device.

6.8.1.2 The aggregate quantity of Class II Liquids and Class IIIA Liquids which may be stored within a building shall not exceed in the case of a Tank, 120 gal (454 L) capacity, and in the case of a container, 240 Gal (908 L). The quantity for each class shall not exceed 120 Gal (454 L). Liquids in storage shall be maintained in Tanks or in containers that are closed or are fitted with a Dispensing Device.

6.8.2 Class I Liquids, Class II Liquids, and Class IIIA Liquids in Tanks Exceeding 120 Gal (454 L) Capacity

The storage inside buildings of Class I Liquids, Class II Liquids and Class IIIA Liquids in Tanks or containers exceeding 120 Gal (454 L) capacity shall not be permitted.

6.8.3 Class IIIB Liquids

6.8.3.1 The quantity of Class IIIB Liquids (Refer Table 1) in storage shall not be limited. Class IIIB Liquids shall be permitted to be stored in and dispensed from Tanks and containers that meet the requirements of NFPA 30, Flammable and Combustible Liquids Code, Section 4.2, Design and Constructions of Tanks, and Section 6.2, Design, Construction and Capacity of Containers, as applicable.

6.8.3.2 Tanks storing Class IIIB Liquids inside buildings shall be permitted to be located at, below, or above grade. Adequate drainage shall be provided.

6.8.4 Diking Around Aboveground Tanks

6.8.4.1 Diking of aboveground tanks shall meet the following requirements:

6.8.4.1.1 The volumetric capacity of the diked area shall not be less than the greatest amount of liquid that can be released from the largest tank within the diked area plus some free board, assuming a full tank. To allow for volume occupied by tanks, the capacity of the diked area enclosing more than one tank shall be calculated after deducting the volume of the tanks, other than the largest tank, below the height of the dike.

6.8.4.1.2 To permit access, the outside base of the dike at ground level shall be no closer than 10 ft (3 m) to any property line that is or can be built upon.

6.8.4.1.3 Walls of the diked area shall be of earth, steel, concrete, or solid masonry designed to be liquid tight and to withstand a full hydrostatic head. Earthen wall 3 ft (0.9 m) or more in height shall have a flat section at the top not less than 2 ft (0.6 m) wide. The slope of an earthen wall shall be consistent with the angle

of repose of the material of which the wall is constructed.

6.8.4.1.4 The walls of the diked area shall be restricted to an average interior height of 6 ft. (1.8 m) above interior grade. Dikes shall be permitted to exceed this height where provisions are made for normal access and necessary emergency access to tanks, valves, and other equipment, and safe egress from the diked enclosure and where the following requirements are met:

(a) The minimum distance between tanks and toe of the interior dike walls shall be 5 ft (1.5 m).

(b) Storage of combustible materials, empty or full drums, or barrels, shall not be permitted within the diked area.

CHAPTER 4 – PIPING FOR LIQUIDS

7. Scope and General Requirements for all Piping Systems

7.1 Scope

This chapter shall apply to piping systems consisting of pipe, tubing, flanges, bolting, gaskets, valves, fittings, flexible connectors, the pressure-containing parts of other components such as expansion joints and strainers, and devices that serve such purposes as mixing, separating, snubbing, distributing, metering, controlling flow, or secondary containment of liquids and associated vapours.

7.2 General Requirements

All piping materials that soften on fire exposure such as plastics, or non-ductile material such as cast iron shall be permitted to be used underground for all liquids within the pressure and temperature limits of ANSI B 31, American National Standard Code for pressure piping.

7.2.1 The design, fabrication, assembly, test, and inspection of the piping system shall meet the requirements of NFPA 30, *Flammable and Combustible Liquids Code, Chapter 3: Piping Systems*.

7.2.2 Where dispensing is from a floating structure or pier, oil-resistant flexible hose shall be permitted to be used between shore piping and the piping on the floating structure or pier and between separate sections of the floating structure to accommodate changes in water

level or shoreline, provided that the hose is either resistant to or shielded from damage by fire.

7.2.3 Low melting point rigid piping shall be permitted to be used between underground shore piping and a floating structure or pier and on the floating structure or pier itself, provided that the piping is protected from physical damage and stresses arising from impact, settlement, vibration, expansion, contraction, or tidal action and provided that the hose is either resistant to or shielded from damage by fire exposure.

7.2.4 Piping shall be located so that it is protected from physical damage. Piping that passes through a dike wall shall be designed to prevent excessive stresses that could result from settlement or fire exposure.

7.2.5 Any portion of a piping system that is in contact with the soil shall be protected from corrosion in accordance with good engineering practice.

7.2.6 All piping inside the buildings but outside the Fuel Dispensing Area shall be enclosed with material having a fire resistance rating of not less than 2 hours.

7.2.7 Each fill pipe shall be identified by colour code or other marking to identify the product for which it is used. The colour code or marking shall be maintained in legible condition throughout the life of the installation.

7.2.8 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 Tank.

8. Installation, Testing, and Venting of Piping Systems

8.1 Installation of Piping Systems

Piping shall be installed in accordance with the designer's instructions.

8.2 Bends

Bends in piping and tubing shall not exceed the bending radius recommended by the designer.

8.3 Flexible Connections

8.3.1 Flexible piping connections shall be provided at the following points in the piping system:

8.3.1.1 Where Liquid and vent piping connects to underground tanks.

8.3.1.2 At the base of any vent riser.

8.3.1.3 Where required to relieve stress at points where the piping changes direction.

8.3.2 Acceptable means for providing flexibility in piping systems shall include the following:

8.3.2.1 Flexible connectors that are approved for the purpose.

8.3.2.2 Piping that is inherently flexible.

6.3.2.3 Other means acceptable to the piping designer.

8.4 Testing

8.4.1 General

All piping and secondary containment piping shall be tested before being covered, enclosed, or placed in service in accordance with the requirements listed as follows:

8.4.1.1 Initial Testing

Unless tested in accordance with the applicable sections of ASME B31.3, *Chemical Plant and Petroleum Refinery Piping*, all piping shall be tested before being covered, enclosed, or placed in use. Testing shall be done hydrostatically to 150% (one hundred fifty percent) of the maximum anticipated pressure of the system or pneumatically to 110% (one hundred ten percent) of the maximum anticipated pressure of the system, and the test pressure shall be maintained for a sufficient time to conduct a complete visual inspection of all joints and connections. In no case shall the test pressure be less than 5 psig (gauge pressure of 34.5 kPa) measured at the highest point of the system, and in no case shall the test pressure be maintained for less than 10 minutes.

8.4.1.2 Initial Testing of Secondary Containment Piping

The interstitial (annular) space of secondary containment-type piping shall be tested hydrostatically or with air pressure at 5 psig (gauge pressure of 34.5 kPa) or shall be tested in accordance with the designer's instructions. The pressure source shall be disconnected from the interstitial space to ensure that the test is being conducted on a closed system. The pressure shall be maintained for a minimum of 1 hour.

8.4.1.3 Testing During Maintenance

Existing piping shall be tested in accordance with this regulation if there is indication that the piping is leaking. Piping that could contain a Class I, Class II, or Class IIIA liquid or vapour shall not be tested using air.

8.4.2 Secondary Containment Piping

In addition to the test required in Regulation 8.4.1, secondary containment-type piping shall have the interstitial space (annulus) tested hydrostatically or with air pressure at minimum of 5 psig (gauge pressure of 34.5 kPa) or shall be tested in accordance with the listing or the manufacturer's instructions. The pressure source shall be closed from the system being tested to ensure that the test is being conducted on a closed system.

8.4.3 Maintenance Testing

Existing piping shall be tested in accordance with Regulation 8.4.1. Piping that could contain flammable or combustible liquids shall not be tested pneumatically.

8.4.4 Leak Detection

On remote pressure pumping systems, each pump shall have installed on the discharge side a leak detection device that will provide an indication if the piping and dispensing devices are not liquid-tight. Each leak-detecting device shall be checked and tested at least annually according to the manufacturer's specifications to ensure proper installation and operation.

8.5 Vent Piping

8.5.1 Vent piping shall meet the requirements of Regulation 6.1.1.4 .

8.5.2 Vent pipes for all Tanks storing Class I Liquids shall discharge only in an upward direction in order to disperse vapours and shall terminate at least 12 ft (3.6 m) above grade.

CHAPTER 5 – FUEL DISPENSING SYSTEMS

9. Scope and General Requirements for Fuel Dispensing Systems

9.1 Scope

This Chapter shall apply to the system and components that dispense fuel into the tanks of motor vehicles and marine craft.

9.2 General Requirements

9.2.1 Dispensing Devices shall be located so that all parts of the vehicle being served are on the premises of the Motor Fuel Dispensing Facility.

9.2.2 Liquids shall not be dispensed by applying pressure to drums, barrels, and similar containers.

10. Requirements for Dispensing Devices

10.1 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.

10.2 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 to their brackets or to their normal non-dispensing position.

10.3 Dispensing Devices shall be mounted on a concrete or block or brick work island or shall otherwise be protected against collision. Dispensing Devices shall be securely bolted in place. Dispensing Devices shall be installed in accordance with the manufacturers' instructions.

10.4 When maintenance to Class I Liquid Dispensing Devices is necessary, and such maintenance is capable of causing accidental release or ignition of Liquid, the following precautions shall be taken before such maintenance is begun:

10.4.1 Only persons knowledgeable in performing the required maintenance shall perform the work.

10.4.2 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.

10.4.3 The emergency shutoff valve at the dispenser, if installed, shall be closed.

10.4.4 All vehicular traffic and unauthorized persons shall be prevented from coming within 20 ft (6 m) of the Dispensing Device.

10.5 Motor vehicle traffic patterns at Motor Fuel Dispensing Facilities shall be designed to inhibit movement of vehicles that are not being fuelled from passing through the Furl Dispensing Area

10.6 At unattended self-serve Motor Fuel Dispensing Facilities, coin or currency type devices shall only be permitted in accordance with Regulation 17.5.

10.7 Where Liquid is supplied to the Dispensing Device under pressure, 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 the supply line at the base of each individual island-type dispenser or at the inlet of each overhead Dispensing Device. The emergency shutoff valve shall be installed in accordance with the manufacturer's instructions. The emergency shutoff valve shall not incorporate a slip-joint feature.

10.8 The automatic-closing feature of the valve shall be tested at the time of installation and at least once a year thereafter by manually tripping the hold-open linkage. Records of such tests shall be kept at the premises or shall be made available for inspection within 24 hours of a request therefore.

11. Requirements for Remote/Submersible Pumps

11.1 Scope

This Regulation shall apply to systems for dispensing Class I Liquids and Class II Liquids where the Liquids are transferred from storage to individual or multiple Dispensing Devices by pumps located other than at the Dispensing Devices.

11.2 Requirements for remote and Submersible Pumps

11.2.1 Pumps shall be designed or equipped so that no part of the system will be subjected to pressures above its allowable working pressure.

11.2.2 Each pump shall have installed on the discharge side a leak detection device that will provide an indication if the piping or a dispenser is leaking. A leak detection device shall not be required if all piping is visible.

11.2.3 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 Regulation 10.4 or in sumps as provided in Regulation 11.2.4. Pumps shall be anchored and protected against physical damage.

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

12. Requirements for Dispensing Hoses

12.1 Liquid fuel compatible hose assemblies shall be used to dispense such Liquids. Hose length at Motor Fuel Dispensing Facilities shall not exceed 18 ft (5.5 m). Where hose length at Marine Motor Fuel Dispensing Facilities exceeds 18 ft (5.5 m), the hose shall be secured so as to protect it from damage.

13. Requirements for Fuel Delivery Nozzles

13.1 An automatic-closing-type hose nozzle valve, with or without latch-open device, shall be provided on island-type Dispensing Devices used to dispense Class I Liquids.

13.2 If a hose nozzle valve is provided with a latch-open device other than the one 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 all applicable requirements of UL 842, Standard for Valves for Flammable Fluids, Section 19A.

13.3 At any retail outlet where the normal flow of Liquids can be stopped other than by the hose nozzle valve, such as at pre-pay facilities, either the system shall include suitable 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.

13.4 Overhead-type dispensing devices shall be provided with an automatic-closing-type hose nozzle valve without a latch-open device. An automatic closing type hose nozzle valve with latch-open device shall be permitted to be used if the hose nozzle valve will close automatically in the event the valve is released from a fill opening or upon impact.

13.5 Dispensing nozzles used at Marine Motor Fuel Dispensing Facilities shall be of the automatic-closing type without a latch-open device.

14. Emergency Electrical Disconnects

14.1 Liquid fuel dispensing systems shall be provided with one or more clearly identified emergency shutoff devices or electrical disconnects. Such devices or disconnects shall be installed in locations not less than 20 ft (7 m) or more than 200 ft (67 m) from the fuel Dispensing Devices that they serve. Emergency shutoff devices or electrical disconnects shall disconnect power to all Dispensing Devices, to all remote pumps serving the Dispensing Devices, to all associated power, control, and signal circuits, and to all other electrical equipment in the hazardous (classified) locations surrounding the fuel Dispensing Devices. When more than one emergency shutoff device or electrical disconnect is provided, all devices shall be interconnected. Resetting following an emergency shutoff condition shall require manual

intervention. Intrinsically safe electrical equipment need not meet this requirement.

14.2 At attended Motor Fuel Dispensing Facilities, the devices or disconnects shall be readily accessible to the attendant.

14.3 At unattended Motor Fuel Dispensing Facilities, the devices or disconnects shall be readily accessible to patrons and at least one device or disconnect shall be readily accessible to each group of Dispensing Devices on an individual island.

CHAPTER 6 – MOTOR FUEL DISPENSING FACILITIES

15. Building Construction Requirements

15.1 Scope

This Chapter shall apply to the construction of buildings and portions of buildings that are Motor Fuel Dispensing Facilities or Repair Garages.

15.2 Fixed Fire Protection

15.2.1 For an unattended, self-serve, Motor Fuel Dispensing Facility, additional fire protection shall be provided where required.

15.2.2 Where required, an automatic fire suppression system shall be installed in accordance with the appropriate NFPA standard and manufacturers' instructions.

15.3 Heat Producing Appliances

15.3.1 Heat producing appliances shall be installed in accordance with the requirements of the Regulation 15.3. They shall be permitted to be installed in the conventional manner except as provided in the Regulation 15.3.

15.3.2 Solid fuel stoves, improvised furnaces, salamanders, or space heaters shall not be permitted in areas of Repair Garages used for repairing or servicing of vehicles or in a Fuel Dispensing Area.

15.3.3 Unit heaters, when installed in accordance with this Chapter, need not meet the requirement mentioned in Regulation 15.3.2.

15.3.4 Heat producing appliances using gas or oil fuel shall be permitted to be installed in a 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. (455 mm) above the floor and the appliances are protected from physical damage.

15.3.5 Heat producing appliances using gas or oil fuel for use in garages shall be permitted to be installed in lubrication rooms, service rooms, or Fuel Dispensing Areas where Class I Liquids are dispensed or transferred, provided the equipment is installed at least 8 ft (2.4 m) above the floor.

15.3.6 Where major repairs are conducted on CNG fuelled vehicles, open flame heaters or heating equipment with exposed surfaces having a temperature in excess of 750°F (399°C) shall not be permitted.

15.3.7 Electrical heat-producing appliances shall meet the requirements of Regulation 16.

15.4 Pits, below grade Work Areas, and sub floor Work Areas

15.4.1 Pits, below grade work areas, and sub floor work areas, used for lubrication, inspection, and minor automotive maintenance works, shall comply with the provisions of this Regulation.

15.4.2 Walls, floors, and structural supports shall be constructed of masonry, concrete or steel.

15.4.3 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/ft^2 (0.3 m^3/min/m^2) 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.

15.5 The use of Mobile Fuel Dispensing Facilities shall be allowed for dispensing of Class I and II liquids from tank vehicles into the fuel tanks of motor vehicles.

15.6 The tank vehicle, while in service, shall not be left unattended.

15.7 There shall be signs stating "NO SMOKING" or “NO OPEN FLAME” within 25 feet, readily visible at the fueling site.

15.8 There shall be adequate lighting for night-time operation.

15.9 The private fuelling area shall be located on an area graded in a manner to direct the spill away from buildings, storage and property lines.

15.10 Spills of diesel during mobile fuelling must be reported as spills of hazardous materials.

15.11 Spill containment containers should be used during filling.

15.12 Equipment on fuelling vehicles, particularly hoses and nozzles, needs to be maintained and replaced at established intervals to prevent failures.

15.13 Minimum Safety Distances for Fuel Dispensing Facilities

15.13.1 Fuel Storage units shall be atleast 3 meters away from footpath and 5 meters away from filling point.

15.13.2 Fuel dispensing point shall be at least 4.5 meters away from footpath or public place and 3 meters away from any opening into a building.

15.13.3 Fuel storage unit(s) shall be provided with security fence at least 1 meter away from the cylinder bank.

15.13.4 Where more than one fuel units are installed, the separating distance between the units shall not be less than 2 meters.

15.13.5 The minimum distance between island to island shall be 5 meters.

16. Electrical Installation

16.1 Scope

This Regulation shall apply to the installation of electrical wiring and electrical utilization equipment in areas where Liquids are stored, handled, or dispensed.

16.2 General Requirements

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.

16.3 Classified Areas for Power Operated Dispensing Devices

16.3.1 Class I Hazardous Locations

Locations in which flammable gases or vapours are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. For the purpose of these requirements, as applied to dispensing systems of other than the overhead type, the following classified areas are further defined. Such areas for overhead type systems shall be as specified in Chapter 7 - Marine Fuelling. The area of the dispensing systems covered by these requirements is the envelope defined by the maximum outer dimensions. (Refer to figures in Appendix 1)

16.3.1.1 Class I, Group D, Division 1:

(a) The area within a Housing up to 4 feet (1.2 m) vertically above the base, except for that area defined as Division 2 or unclassified.

(b) Any area within a nozzle boot.

16.3.1.2 Class I, Group D, Division 2:

(a) Areas within a Housing above the Division 1 area.

(b) The area surrounding the Housing within 18 inches (46 cm) horizontally in all directions from the Division 1 area located within the Housing.

(c) The area within 18 inches horizontally, in all directions from the opening of a nozzle boot not isolated by a vapour-tight partition, except that the area is not required to be extended around a 90-degree or greater corner.

Note: See Figures 1 and 2 in the Appendix to these Technical Standards for an illustration of Class I hazardous locations.

16.3.2 Unclassified Area

An area within a Housing isolated from Division 1 or Division 2 by a Vapour Barrier or a solid nozzle boot, but not completely surrounded by a Division 1 or Division 2 area, that does not contain levels of flammable gases or vapours that are capable of producing explosive or ignitable mixtures.

16.4 Air Gap

16.4.1 Dispensing Devices which incorporate an Air Gap construction shall provide a minimum 1 inch (25.4 mm) free air space between planes of classified areas and unclassified areas. See Figure 3 in the Appendix to these Technical Standards for details.

16.4.2 When an Air Gap is provided with a decorative cover that incorporates louvers, screens, or similar parts, a minimum 1 inch (25.4 mm) per “running” inch of the gap is required.

16.4.3 A decorative cover used on a horizontal Air Gap that is vertically larger than the Air Gap meets the intent of the requirements in this Regulation 16.4 as long as it does not extend above the plane of the unclassified area.

16.4.4 The front edge of a decorative cover that is located adjacent to the classified area shall be flush with the bottom of the cover, except for vertical members.

16.4.5 Conduit or other assemblies that are routed through the Air Gap shall be mechanically secured such that a minimal amount of open area is provided. The size and position of assemblies shall not create areas within the Air Gap where the movement of air is stopped.

16.4.6 Unused openings in the decks of the Air Gap shall be mechanically sealed.

16.5 Installation in Classified Locations.

16.5.1 Table 4 shall be used to delineate and classify areas for the purposes of installing electrical wiring and electrical utilization equipment.

16.5.2 The extent of the classified area around a vacuum assist blower shall be permitted to be reduced if the blower is specifically approved for such reduced distances.

Table 4 (Electrical Equipment Classified Areas — Motor Fuel Dispensing Facilities)

Location	*NEC* Class I, Group D Division	Extent of Classified Area[1]
Dispensing Device	(except Overhead Type)	See Appendix for Fi gure 4 in Appendix to these Technical Standards
Pits	1	Any pit, box, or space below-grade level, any part of which is within a Division 1 or Division 2 classified area
Dispenser	2	Within 18 in. horizontally in all directions extending to grade from the dispenser enclosure or that portion of the dispenser enclosure containing Liquid handling components
Outdoor	2	Up to 18 in. above grade level within 20 ft horizontally of any edge of enclosure
Dispensing Device — overhead		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,

Location	*NEC* Class I, Group D Division	Extent of Classified Area[1]
		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 where Class I liquids are dispensed *(see Regulation 16.5.5*	1	Any pit within any unventilated area
	2	Any pit with ventilati on
	2	Area up to 18 in. above floor or grade level and 3 ft horizontally from a lubrication pit
Dispenser for Class I Liquids	2	Within 3 ft of any fill or dispensing point, extending in all directions
Lubrication or service room where Class I liquids are not dispensed *(see Regulation 16.5.5*	2	Entire area within any pit used for lubrication or similar services where Class I liquids can 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
	Non-classified	Any pit, below-grade work area, or sub-floor work area that is ventilated in accordance with Regulation 16.4.3
Interior of special enclosure	1	Entire interior volume, if Class I Liquids are stored within
Sales, storage, and rest rooms	Non-classified	If there is any opening to these rooms within the extent of a Division 1 area, the entire room is classified as Division 1
Tank, aboveground	1	Area inside dike where dike height is greater than the distance from the tank to the dike for more than 50% (fifty percent) of the tank circumference
Shell, ends, or roof and dike area	2	Within 10 ft of shell, ends, or roof of Tank; area within dike to level of top of dike

Location	*NEC* Class I, Group D Division	Extent of Classified Area[1]
Vent	1	Within 5 ft of open end of vent, extending in all directions
	2	Between 5 ft and 10 ft from open end of vent, extending in all directions
Underground tank fill opening	1	Any pit, box, or space below grade level, any part of which is within a Division 1 or 2 classified area
	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
Equipment enclosures	1	Any area within the enclosure where vapour or Liquid is present under normal operating conditions
	2	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
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

For SI units, 1 in. = 25 mm; 1 ft = 0.30 m

1 For marine application, grade level means the surface of a pier, extending down to water level

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

3 Ceiling-mounted hose reel

4 Refer to Figure 4 (Appendix) for an illustration of classified areas around dispensing devices

16.5.3 A designated classified area, as specified in Table 4, shall not extend beyond a floor, wall, roof, or other solid partition that has no openings.

16.5.4 The area classifications given in Table 4 shall be based on the premise that the installation meets the applicable requirements of this code in all respects.

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

16.5.6 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 4 and in NFPA 70, National Electrical Code.

16.5.7 The storage, handling, and dispensing of methyl alcohol based windshield washer fluids shall not cause an area to be designated as a hazardous (classified) location.

16.5.8 The storage, handling, and dispensing of Class II Liquids or Class III Liquids shall not cause an area to be designated as a hazardous (classified) location.

16.5.9 The clearance between electrical cables and ground or any other structure shall not be less than 1 foot.

16.6 Emergency Electrical Disconnects

Emergency electrical disconnects shall be installed at the locations required by Regulation 14.

16.7 Specific Requirements for Marine Fuel Facilities

16.7.1 Where excessive stray currents are encountered, piping handling Class I Liquids and Class II Liquids shall be electrically isolated from the shore piping.

16.7.2 Pipelines on piers shall be 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.

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

17. Operational Requirements

17.1 Scope

This Regulation shall apply to those requirements that relate to the operation of Motor Fuel Dispensing Facilities and fuel dispensing systems.

17.2 Basic Requirements

17.2.1 Inventory Control

Accurate daily inventory records shall be maintained and reconciled for all Liquid fuel storage Tanks for indication of possible leakage from Tanks or piping. The records shall be kept on the premises or shall be made available for inspection within 24 hours of a request therefore. The records shall include, by product, daily reconciliation between sales, use, receipts, and inventory on hand. If there is more than one storage system serving an individual pump or Dispensing Device for any Liquid, the reconciliation shall be maintained separately for each system.

17.2.2 Tank Filling and Bulk Delivery

17.2.2.1 Delivery operations shall meet the requirements of Regulations 17.2.2.2 through 17.2.2.7.

17.2.2.2 The delivery vehicle shall be separated from any aboveground tank by at least 25 feet (7.6 m)

17.2.2.3 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.

17.2.2.4 No minimum separation distance shall be required for Tanks that are filled by gravity.

17.2.2.5 The delivery vehicle shall be located so that all parts of the vehicle are on the premises when delivery is made. Existing fuel dispensing facilities and fuel dispensing facilities inside buildings shall not be required to meet this requirement.

17.2.2.6 Tank filling shall not begin until the delivery operator has determined that the Tank has sufficient available capacity (ullage).

17.2.2.7 Tanks shall be filled through a liquid-tight connection. Where an Aboveground Storage 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.

17.2.3 Dispensing into Containers

Class I Liquids or Class II Liquids shall not be dispensed into portable containers unless the container is constructed of metal has a tight closure, and is fitted with a spout or so designed that the contents can be poured without spilling. The hose nozzle valve shall be manually held open during the dispensing operation.

17.2.4 Basic Fire Control

17.2.4.1 Sources of Ignition

Smoking materials, including matches and lighters, shall not be used (on the premises other than inside the building) within 20 ft (6 m) of areas used for fuelling, servicing fuel systems of internal combustion engines, or receiving or dispensing of Class I Liquids. The motors of all equipment being fuelled shall be shut off during the fuelling operation except for emergency generators, pumps, and so forth, where continuing operation is essential.

17.2.4.2 Fire Extinguishers

Each Motor Fuel Dispensing Facility shall be provided with one or more 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, storage tank fill pipe opening, and lubrication or service room.

17.2.4.3 Signs

Warning signs shall be conspicuously posted in the Fuel Dispensing Area and shall incorporate the following minimum or equivalent wording:

W A R N I N G
No smoking
Switch-off Engine
Switch-off Mobile Phone

17.2.5 Waste Handling

17.2.5.1 Crankcase drainings and waste liquids and Liquid fuels shall not be dumped into sewers, into streams, or on the ground. They shall be stored in tanks or containers outside any building, or in tanks installed in accordance with

Chapters 3 and 4, until removed from the premises. Exception: As provided for in 6.8.3.

17.2.5.2 Spray of fuel or oil on to the vehicle (any part) shall not be permitted in repair garage and service station.

17.2.5.3 If crankcase draining and waste liquids/Liquid fuels are mixed with water in washing facilities, then this Oil water stream shall pass through Oil-Water Separator to separate the oil from water. The contents of oil separators shall be collected at sufficiently frequent intervals to prevent oil from being carried into sewers.

17.2.6 Housekeeping

17.2.6.1 The Fuel Dispensing Area and the area within any dike shall be kept free of vegetation, debris, and any other material that is not necessary to the proper operation of the Motor Fuel Dispensing Facility.

17.2.6.2 Floors shall be kept clean and free of oil and grease.

17.2.7 Fire Doors

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

17.3 Operating Requirements for Full-Service Motor Fuel Dispensing Facilities

Each Motor Fuel Dispensing Facility shall have an attendant or supervisor on duty whenever the facility is open for business. The attendant or supervisor shall dispense Liquids into fuel tanks or into containers, except as covered in Regulations 17.4 and 17.5.

17.4 Operating Requirements for Attended Self-Service Motor Fuel Dispensing Facilities

17.4.1 Self-service Motor Fuel Dispensing Facility shall mean that portion of Motor Fuel Dispensing Facility where Liquids used as motor fuels are stored and dispensed from fixed, dispensing equipment into the fuel tanks of motor vehicles by persons other than the facility attendant and shall also include, where provided, facilities for the sale of other retail products.

17.4.2 There shall be at least one attendant on duty while the self-service facility is open for business. The attendant's primary function shall be to supervise, observe, and control the dispensing of Class I Liquids while such Liquids are actually being dispensed.

17.4.3 The responsibility of the attendant shall be as follows:

17.4.3.1 Prevent the dispensing of Class I liquids into portable containers not in compliance with Regulation 17.2.3.1.

17.4.3.2 Prevent the use of hose nozzle valve latch-open devices that do not comply with Regulation 13.2.

17.4.3.3 Control sources of ignition.

17.4.3.4 Immediately activate emergency controls and notify the fire department if any fire.

17.4.3.5 Handle accidental spills and fire extinguishers if needed.

17.4.4 The attendant or supervisor on duty shall be mentally and physically capable of performing the functions and assuming the responsibility prescribed in Regulation 17.4.

17.4.5 Operating instructions shall be conspicuously posted in the Fuel Dispensing Area.

17.5 Operating Requirements for Unattended Self-Service Motor Fuel Dispensing Facilities

17.5.1 Operating instructions shall be conspicuously posted in the Fuel Dispensing Area. The instructions shall include location of emergency controls and a requirement that the user stay outside of his/her vehicle and in view of the fuelling nozzle during dispensing.

17.5.2 In addition to the warning signs specified in Regulation 17.2.4.3, emergency instructions shall be conspicuously posted in the dispenser area. The instructions shall incorporate the following or equivalent wording:

Emergency Instructions

In case of fire or spill:
(a) Use emergency stop button.
(b) Report accident by calling (specify local fire number) on the phone.
(c) Report location.

17.5.3 An automatic closing type hose nozzle valve with latch-open device shall be provided. The hose nozzle valve shall meet the requirements of Regulation 13.3.

17.5.4 A telephone or other clearly identified means to notify the fire department shall be provided on the site.

17.5.5 Additional fire protection shall be provided where required.

17.5.6 Power generators, both gas fired & liquid fuel, can be used if meets hazardous area classification requirements as given in regulation 16.3.1.

CHAPTER 7 - MARINE FUELLING

18. Marine Fuelling Systems

18.1 Scope

18.1.1 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,

18.1.2 This Chapter shall not apply to the following:

18.1.2.1 Bulk plant or terminal loading and unloading facilities.

18.1.2.2 Transfer of Liquids utilizing a flange-to-flange closed transfer piping system.

18.1.2.3 Marine Motor Fuel Dispensing Facilities where Liquids used as fuels are stored and dispensed into the fuel tanks of marine craft of 300 gross tons (272 metric tons) or more.

18.1.3 For the purpose of this Chapter, the expression “pier” shall also mean and include docks, floating docks, and wharfs.

18.2 Storage

18.2.1 Liquids shall be stored in tanks or containers complying with Regulation 6.

18.2.2 Tanks that supply Marine Motor Fuel Dispensing Facilities shall be located on shore or on a pier of the solid-fill type. Pumps that are not integral with the Dispensing Device shall also be located on shore or on a pier of the solid-fill type.

18.2.3 Where shore location would require excessively long supply lines to Dispensing Devices, Tanks shall be permitted to be located on a pier, provided the installation meets all applicable requirements of NFPA 30, Flammable and Combustible Liquids Code, Chapters 3, 3 and 5.9.5, and the quantity stored does not exceed 1100 gal (4164 L) aggregate capacity.

18.2.4 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, an internal valve or an

external valve located as close as practical to the shell of the tank, that will prevent gravity flow from the Tank to the dispenser. This device shall be installed and adjusted so that liquid cannot flow by gravity from the Tank to the dispenser if the piping or hose fails when the dispenser is not in use.

18.3 Piping Systems

18.3.1 Piping shall be installed in accordance with all applicable requirements of Chapter 4.

18.3.2 Piping systems shall be supported and protected against physical damage and stresses arising from impact, settlement, vibration, expansion, contraction, and tidal action.

18.3.3 Provision shall be made to ensure flexibility of the piping system in event of motion of the pier. Flexible piping shall be of a type designed to withstand the forces and pressures exerted upon the piping.

18.3.4 Where dispensing is from a floating structure or pier, oil-resistant flexible hose shall be permitted to be used between shore piping and the piping on a floating structure or pier and between separate sections of the floating structure to accommodate changes in water level or shoreline, provided that the hose is either resistant to or shielded from damage by fire.

18.3.5 A 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.

18.4 Fuel Dispensing System

18.4.1 Where hose length exceeds 18 ft (5.5 m), the hose shall be secured so as to protect it from damage.

18.4.2 Dispensing nozzles shall be of the automatic-closing type without a latch-open device.

18.4.3 Dispensing Devices shall be permitted to be located on open piers, 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 to and egress from marine craft.

18.4.4 Dispensing Devices shall be located so that exposure to all other operational marina or pleasure boat berthing area facilities is minimized. Where tide and weather conditions permit, Liquid fuel handling shall be outside the main berthing areas. Where located inside marina or pleasure craft berthing areas, fuelling facilities shall

be located so that, in case of fire aboard a marine craft alongside, the danger to other craft near the facility is minimized. No vessel or marine craft shall be made fast to or berthed at any fuel dispensing location except during fuelling operations.

18.4.5 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 fuelling operations.

18.4.6 A Marine Motor Fuel Dispensing Facility located at a bulk plant shall be separated by a fence or other barrier from areas in which bulk plant operations are conducted. Dispensing Devices shall not be supplied by Aboveground Storage Tanks located in the bulk plant. Marine Motor Fuel Dispensing Facility storage Tanks shall not be connected by piping to Aboveground Storage Tanks located in the bulk plant.

18.4.7 Each Marine Motor Fuel Dispensing Facility shall have an attendant or supervisor on duty whenever the facility is open for business. The attendant's primary function shall be to supervise, observe, and control the dispensing of liquids.

18.5 Sources of Ignition

18.5.1 All electrical components for dispensing liquids shall be installed in accordance with Regulation 16.

18.5.2 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.

18.5.3 Clearly identified emergency electrical disconnects that are readily accessible in case of fire or physical damage at any dispensing unit shall be provided on each marine wharf. The disconnects shall be interlocked to shut off power to all pump motors from any individual location and shall be manually reset only from a master switch. Each such disconnect shall be identified by a sign stating "EMERGENCY PUMP SHUTOFF" in 2-in. (50 mm) red capital letters.

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

18.5.5 Smoking materials, including matches and lighters, shall not be used within 20 ft (6 m) of areas used for fuelling, servicing fuel systems for internal combustion engines, or receiving or dispensing of Class I Liquids. Conspicuous "No Smoking" signs shall be posted within sight of the customer being served.

18.5.6 The motors of all equipment being fuelled shall be shut off during the fuelling operation, except for emergency generators, pumps, and so forth, where continuing operation is essential.

18.6 Bonding and Grounding

18.6.1 Where excessive stray currents are encountered, piping handling Class I Liquids and Class II Liquids shall be electrically isolated from the shore piping.

18.6.2 Pipelines on piers shall be 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.

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

18.7 Fire Control

18.7.1 Each Marine Motor Fuel Dispensing Facility shall be provided with one or more fire extinguishers having a minimum classification of 40 B:C. They shall be located so that an extinguisher will be within 100 ft (30 m) of each pump, each Dispensing Device, and each pier-mounted liquid storage tank.

18.7.2 Piers that extend more than 500 ft (152 m) in travel distance from shore shall be provided with a Class III standpipe that is installed in accordance with NFPA 14, Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems.

18.7.3 Materials shall not be placed on a pier in such a manner that they 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.

18.8 Containers and Movable Tanks

18.8.1 The temporary use of movable tanks in conjunction with the dispensing of Liquids into the fuel tanks of marine craft on premises not normally accessible to the public shall be permitted.

18.8.2 Class I Liquids or Class II Liquids shall not be dispensed into a portable container unless the container is constructed of metal, has a tight closure, and is fitted with a spout or is so designed that the contents can be dispensed without spilling.

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

18.9 Cargo Tank Fuelling Facilities

18.9.1 The provisions of Regulation 18.2 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 fuelling marine craft used in connection with their businesses if the requirements of Regulations 10.9.1.1 through 10.9.1.7 are met.

18.9.1.1 The tank vehicle shall comply with the requirements of NFPA 385, Standard for Tank Vehicles for Flammable and Combustible Liquids.

18.9.1.2 The dispensing hose shall not exceed 50 ft (15 m) in length.

18.9.1.3 The dispensing nozzle shall be an automatic-closing type without a latch-open device.

18.9.1.4 Night time deliveries shall only be made in areas deemed adequately lighted.

18.9.1.5 The tank vehicle flasher lights shall be in operation while dispensing.

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

18.10 Operating Requirements

18.10.1 The following shall be the responsibilities of the attendant:

18.10.1.1 Prevent the dispensing of Class I Liquids into portable containers that do not comply with Regulation 18.8.2.

18.10.1.2 Be familiar with the dispensing system and emergency shutoff controls.

18.10.1.3 Ensure that the vessel is properly moored and that all connections are made.

18.10.1.4 Be within 15 ft (4.6 m) of the dispensing controls during the fuelling operation and maintain a direct, clear, unobstructed view of both the vessel fuel filler neck and the emergency fuel shutoff control.

18.10.2 Fuelling shall not be undertaken at night except under well-lighted conditions.

18.10.3 During fuelling operations, smoking shall be forbidden on board the vessel or marine craft and in the Fuel Dispensing Area.

18.10.4 Before opening the tanks of the vessel to be fuelled, the following precautions shall be taken:

18.10.4.1 All engines, motors, fans, and bilge blowers shall be shut down.

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

18.10.4.3 Galley stoves shall be extinguished.

18.10.4.4 All ports, windows, doors, and hatches shall be closed.

18.10.5 After the flow of fuel has stopped, the following shall occur:

18.10.5.1 The fill cap shall be tightly secured.

18.10.5.2 Any spillage shall be wiped up immediately.

18.10.5.3 If Class I Liquid has been delivered, the entire vessel or marine craft shall remain open.

18.10.5.4 Bilge blowers shall be 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, 10 minutes of ventilation shall be required.

18.10.6 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 into the tank. Vessels receiving Class II Liquids or Class IIIA 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 system that extends 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 coming or enclosed rails so that the vapours will dissipate out board.

18.10.7 Owners or operators shall not offer their vessel or marine craft for fuelling unless the following occurs:

18.10.7.1 The tanks being filled are properly vented to dissipate vapours to the outside atmosphere and the fuel systems are liquid-tight and vapour-tight with respect to all interiors.

18.10.7.2 All fuel systems are designed, installed, and maintained in compliance with the specifications of the manufacturer of the vessel or marine craft.

18.10.7.3 Communication has been established between the fuelling attendant and the person in control of the vessel or craft 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.

18.10.7.4 The electrical bonding and grounding systems of the vessel or craft have been maintained in accordance with the designers' specifications.

18.10.8 A sign with the following legends printed in 2 in. (50 mm) red capital letters on a white background shall be conspicuously posted at the Fuel Dispensing Area:

Before Fuelling:

(a) Stop all engines and auxiliaries.

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

(c) Check all bilges for fuel vapours.

(d) Extinguish all smoking materials.

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

During Fuelling:

(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 Fuelling:

(a) Inspect bilges for leakage and fuel odours.

(b) Ventilate until odours are removed.

APPENDIX 1

Figure 1 (Hazardous location of classification within a typical dispenser)

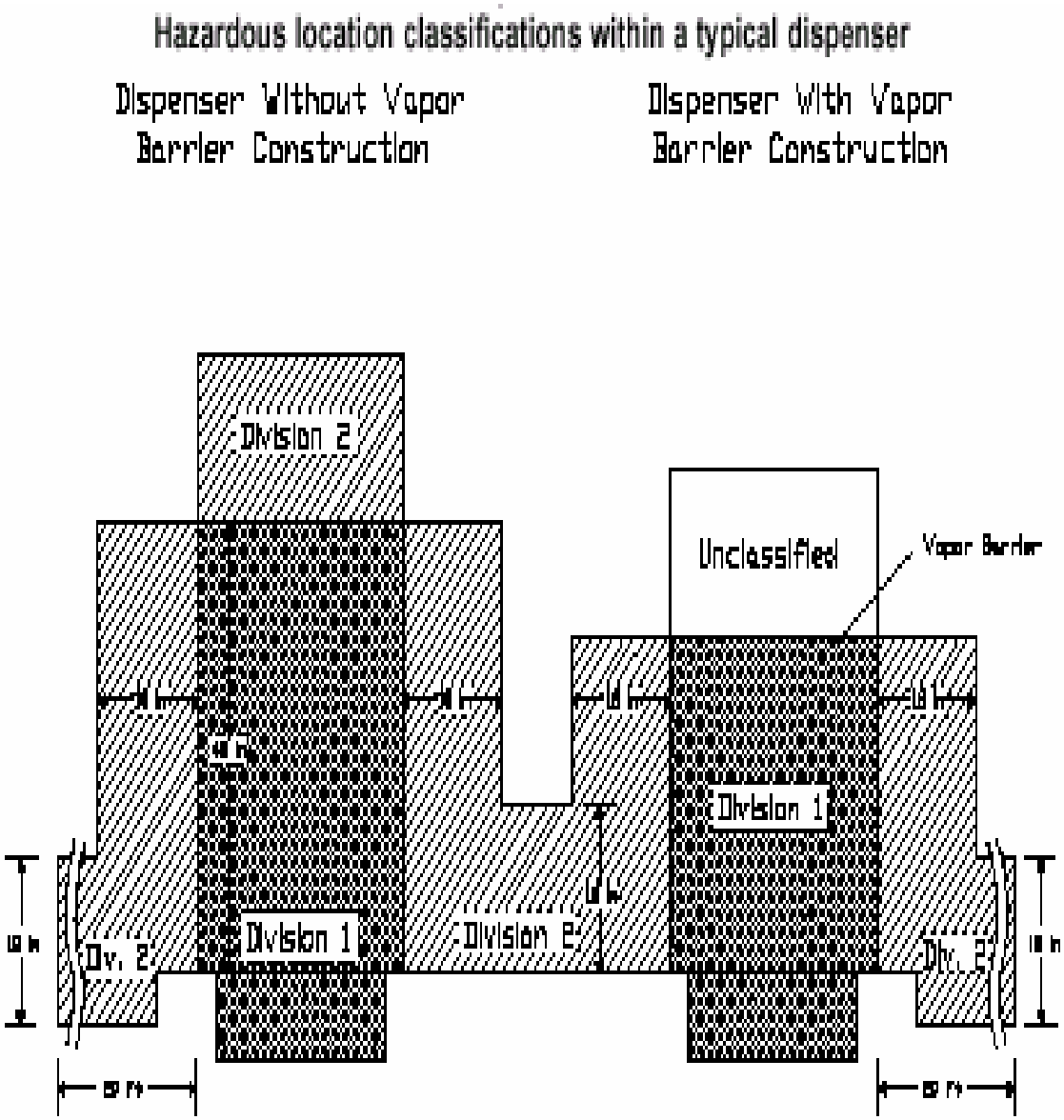


Figure 2 (Hazardous location classification associated with a hose nozzle value boot)

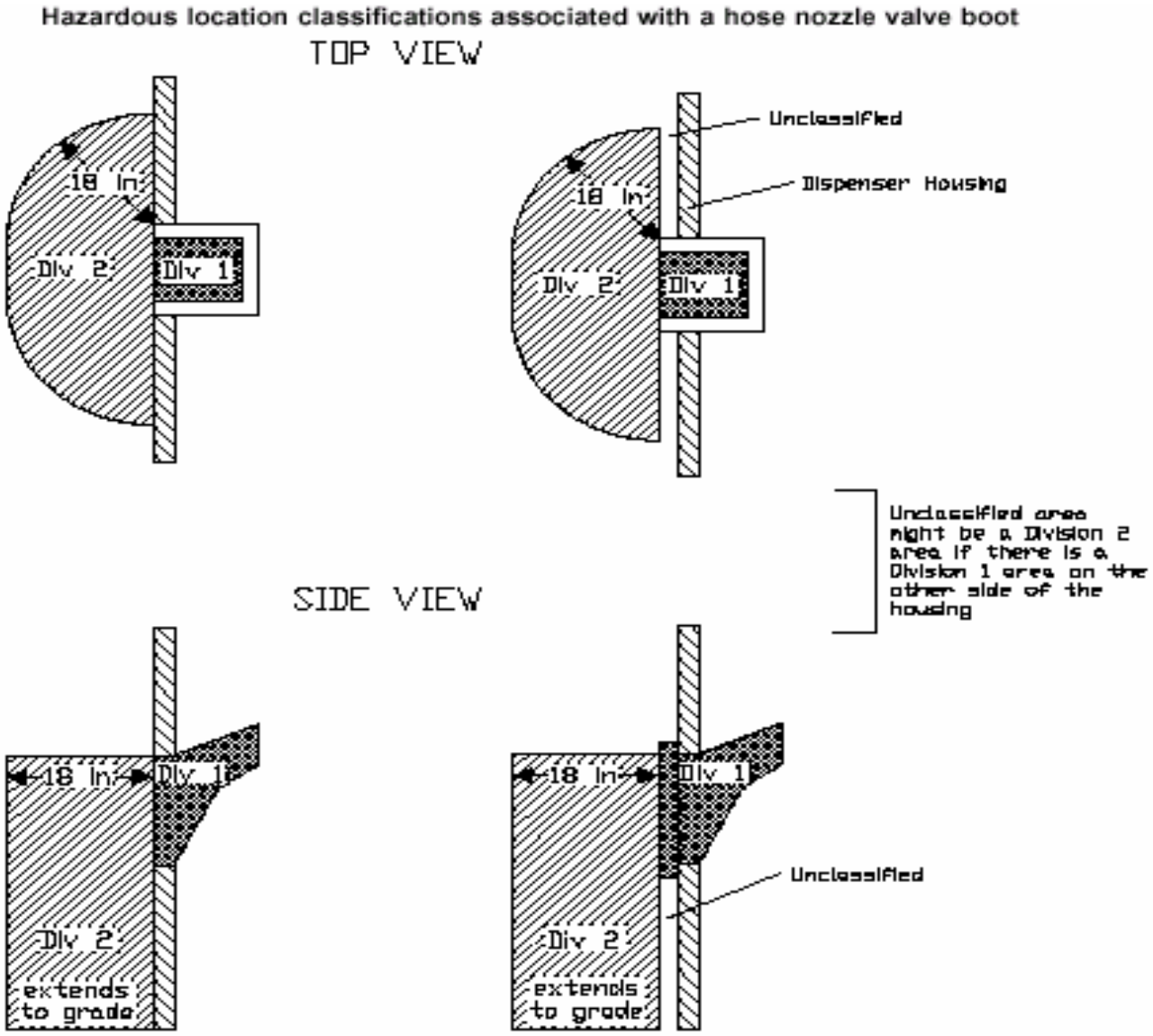


Figure 3 (Use of Air Gap within a typical Dispensing Device)

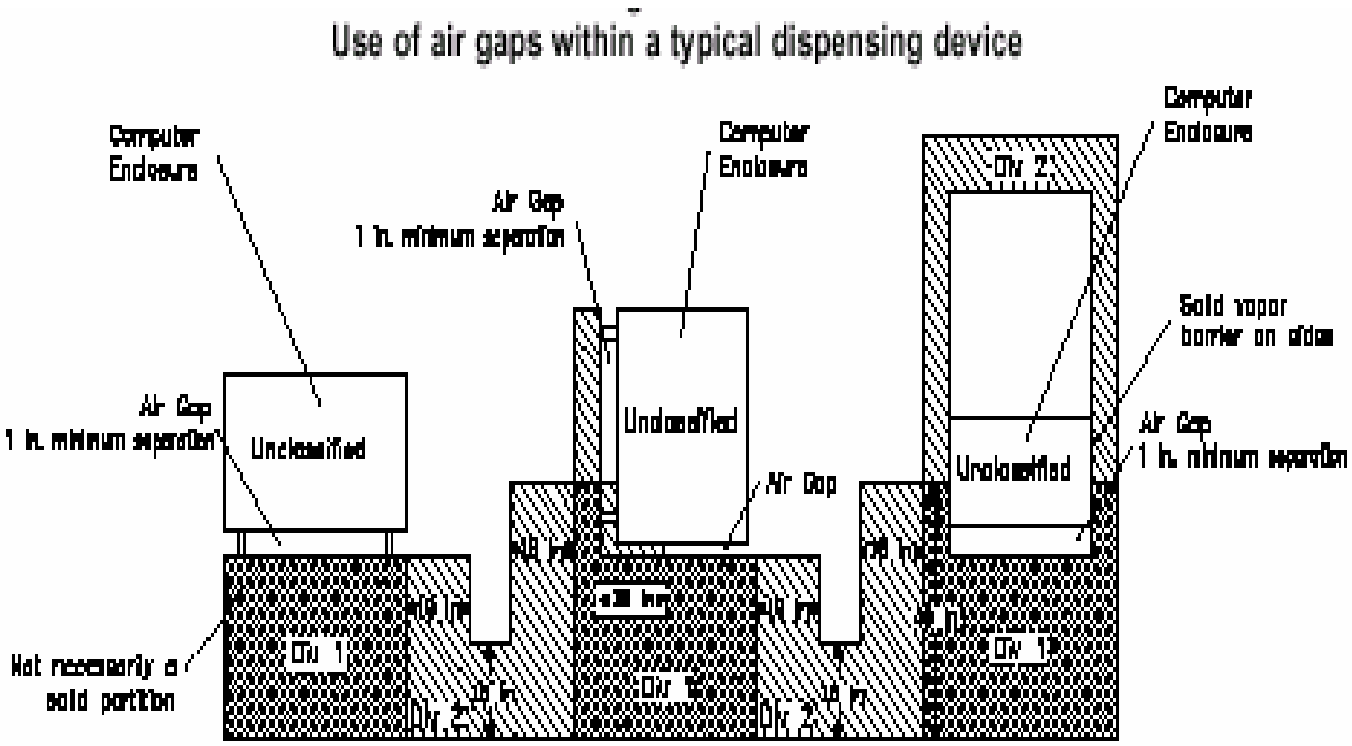
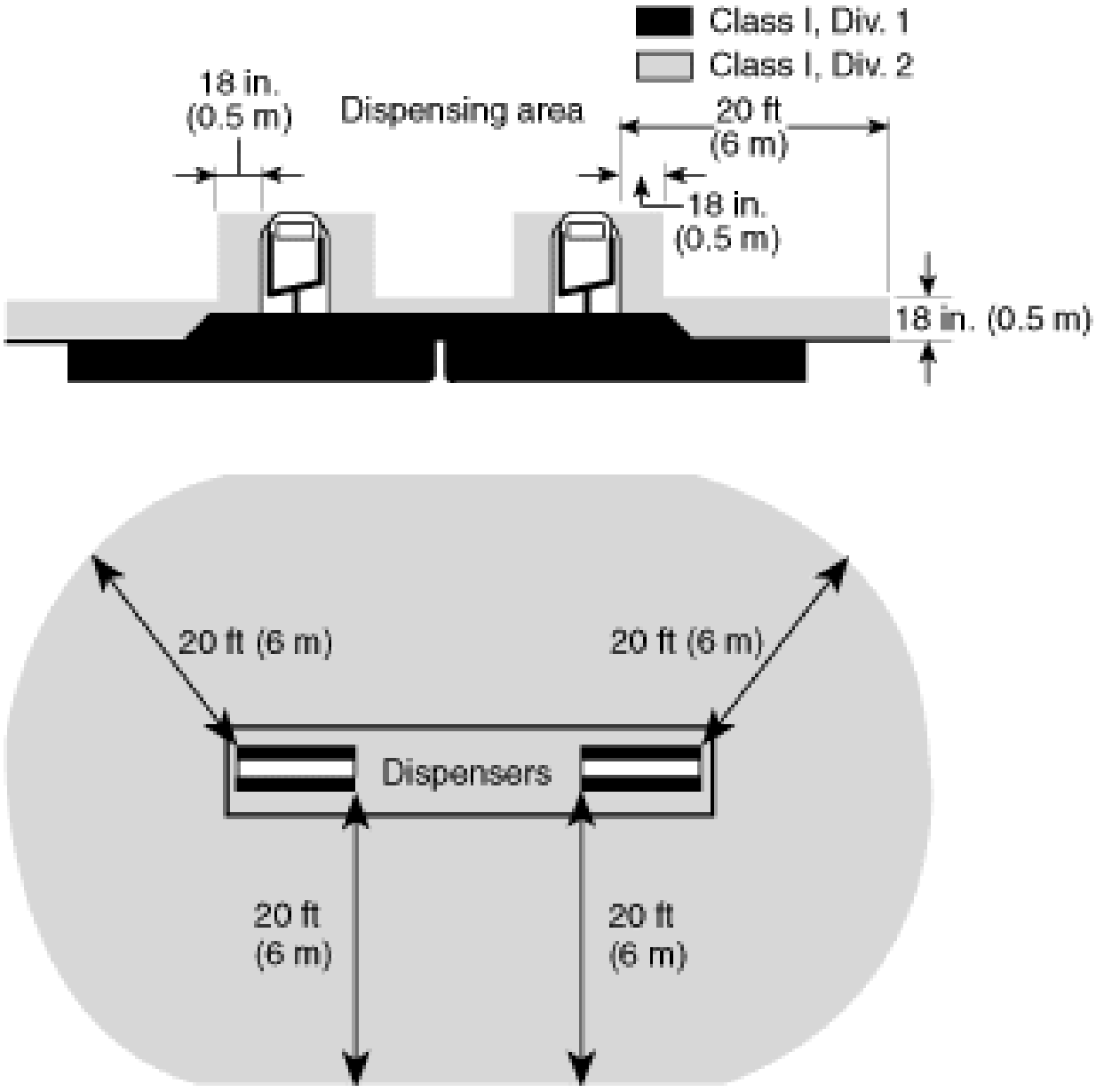


Figure 4 (Classified areas adjacent to dispensers as detailed in Table 1)



APPENDIX 2

Phased applicability of Standards to existing Motor Vehicle Dispensing Facilities

Chapter	Regulation	Topic	Existing petrol pumps	New installations
3	5	Scope & general requirements	2014	Immediate
3	6	Storage of liquids	2014	Immediate
4	7	Scope & general requirements for all piping systems	2014	Immediate
4	8	Installation, testing & venting of piping system	2014	Immediate
5	9	Scope & general requirement for fuel dispensing systems	2013	Immediate
5	10	Requirement for dispensing devices	2013	Immediate
5	11	Requirements for remote/submersible pumps	2014	Immediate
5	12	Requirement of dispensing hoses	2010	Immediate
5	13	Requirement for fuel delivery nozzles	2011	Immediate
5	14	Emergency electrical disconnections	2011	Immediate
6	15	Building construction requirements	2014	Immediate
6	16	Electrical installations	2014	Immediate
6	17	Operational requirements	2011	Immediate
7	18	Scope	2014	Immediate

[File NO. OGRA-5-6(1)/2006-Admn]

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