1301:7-7-22 Motor fuel-dispensing facilities and repair garages.

(A) **Section 2201 General**

(1) **2201.1 Scope.** Automotive motor fuel-dispensing facilities, marine motor fuel-dispensing facilities, fleet vehicle motor fuel-dispensing facilities, *service stations at bulk plants* and repair garages shall be in accordance with this *rule, NFPA 30, NFPA 30A*, the International Fuel Gas Code, the *building code*, and the *mechanical code as listed in rule 1301:7-7-45 of the Administrative C*ode. Such operations shall include both operations that are accessible to the public and private operations.

(a) ***2201.1.1.*** *Notwithstanding paragraphs* (B)(1)(102.1) *and* (B)(2)(102.2) *of rule 1301:7-7-01 of the Administrative Code and unless otherwise noted in this rule, the provisions of this rule shall not apply to facilities, equipment, structures or installations existing or approved for construction or installation prior to the effective date of this rule, except in those cases where the fire code official demonstrates by a preponderance of the evidence that the existing facility, equipment, structure or installation creates a distinct hazard to life or adjacent property.*

(2) **2201.2 Permits.** Permits shall be required as set forth in *rule 1301:7-7-01 of the Administrative Code. In accordance with paragraph (E)(1)(a)(105.1.1) of rule 1301:7-7-01 of the Administrative Code, permits required for the installation, alteration, abandonment, removal or to place temporarily out of service a stationary flammable or combustible liquid storage tank shall be obtained from the fire marshal when such permits are required by this code and are not issued by another officer listed in section 3737.14 of the Revised Code.*

Exception: *A stationary flammable or combustible liquid storage tank with a capacity of 1,100 gallons or less utilized for residential heating oil or agricultural purposes.*

(3) **2201.3 Construction documents.** Construction documents shall be submitted for review and approval prior to the installation or construction of motor fuel-dispensing facilities, *service stations at bulk plants* and repair garages in accordance with *paragraph* (E)(4)(105.4) *of rule 1301:7-7-01 of the Administrative Code*.

(4) **2201.4 Indoor motor fuel-dispensing facilities.** Motor fuel-dispensing facilities located inside buildings shall comply with the *building code* and NFPA 30A *as listed in rule 1301:7-7-45 of the Administrative Code*.

(a) **2201.4.1 Protection of floor openings in indoor motor fuel-dispensing facilities.** Where motor fuel-dispensing facilities are located inside buildings and the dispensers are located above spaces within the building, openings beneath dispensers shall be sealed to prevent the flow of leaked fuel to lower building spaces.

(5) **2201.5 Electrical.** Electrical wiring and equipment shall be suitable for the locations in which they are installed and shall comply with *paragraph* (E)(605) *of rule 1301:7-7-06 of the Administrative Code*, NFPA 30A, the *building code and NFPA 70 as listed in rule 1301:7-7-45 of the Administrative Code*.

(6) **2201.6 Heat-producing appliances.** Heat-producing appliances shall be suitable for the locations in which they are installed and shall comply with NFPA 30A and the ~~*mechanical code* or the International Fuel Gas Code~~ International Fuel Gas Code or the *mechanical code* *as listed in rule 1301:7-7-45 of the Administrative Code*.

(B) **Section 2202 Definitions**

(1) **2202.1 Definitions.** The following words and terms shall, for the purposes of this *rule* and as used elsewhere in this code, have the meanings shown herein.

"Automotive motor fuel-dispensing facility." That portion of property where flammable or combustible liquids or gases used as motor fuels are stored and dispensed from fixed equipment into the fuel tanks of motor vehicles *or approved containers*.

"Dispensing device, overhead type." A dispensing device that consists of one or more individual units intended for installation in conjunction with each other, mounted above a dispensing area typically within the motor fuel-dispensing facility canopy structure, and characterized by the use of an overhead hose reel.

"Fleet vehicle motor fuel-dispensing facility." That portion of a commercial, industrial, governmental or manufacturing property where *flammable or combustible* liquids *or gases* used as fuels are stored and dispensed into the fuel tanks of motor vehicles *or approved containers* that are used in connection with such businesses, by persons within the employ of such businesses.

"Liquefied natural gas (LNG)." A fluid in the liquid state composed predominantly of methane and which may contain minor quantities of ethane, propane, nitrogen or other components normally found in natural gas.

"Marine motor fuel-dispensing facility." That portion of property where flammable or combustible liquids or gases used as *motor* fuel for watercraft are stored and dispensed from fixed equipment on shore, piers, wharves, floats or barges into the fuel tanks of watercraft *or approved containers* and shall include all other facilities used in connection therewith.

"Motor fuel-dispensing facility." *That portion of a property where flammable or combustible liquids or gases used as a fuel are stored and dispensed from fixed equipment into the fuel tanks of motor vehicles or marine craft or into approved containers, including all equipment used in connection therewith.*

"Repair garage." A building, structure or portion thereof used for servicing or repairing motor vehicles.

"Self-service motor fuel-dispensing facility." That portion of a motor fuel-dispensing facility where *flammable or combustible* liquids *or gases* are dispensed from fixed approved dispensing equipment into the fuel tanks of motor vehicles *or approved containers* by persons other than a motor fuel-dispensing facility attendant.

(2) ***2202.2 "Approved" as used in rule 1301:7-7-22 of the Administrative Code.*** *As used in this rule and notwithstanding the definition as set forth in rule 1301:7-7-22 of the Administrative Code, the term "approved", unless otherwise further specified or defined in this rule, means: listed, labeled or tested and documented in research reports from an authoritative source listed in paragraph* (O)(2)(115.2) *of rule 1301:7-7-01 of the Administrative Code, or otherwise acceptable to the fire code official.*

(C) **Section 2203 Location of dispensing devices**

(1) **2203.1 Location of dispensing devices.** Dispensing devices shall be located as follows:

(a) Ten feet (3048 mm) or more from lot lines.

(b) Ten feet (3048 mm) or more from buildings having combustible exterior wall surfaces or building having noncombustible exterior wall surfaces that are not part of a 1-hour fire-resistance-rated assembly or buildings having combustible overhangs.

Exception: Canopies constructed in accordance with the *building code as listed in rule 1301:7-7-45 of the Administrative Code* providing weather protection for the fuel islands.

(c) Such that all portions of the vehicle being fueled will be on the premises of the motor-fuel-dispensing facility.

(d) Such that the nozzle, when the hose is fully extended, will not reach within 5 feet (1524 mm) of building openings.

(e) Twenty feet (6096 mm) or more from fixed sources of ignition.

(2) **2203.2 Emergency disconnect switches.** An approved, clearly identified and readily accessible emergency disconnect switch shall be provided at an approved location, to stop the transfer of fuel to the fuel dispensers in the event of a fuel spill or other emergency. An emergency disconnect switch for exterior fuel dispensers shall be located within 100 feet (30 480 mm) of, but not less than 20 feet (6096 mm) from, the fuel dispensers. For interior fuel-dispensing operations, the emergency disconnect switch shall be installed at an approved location. Such devices shall be distinctly labeled as: ~~EMERGENCY FUEL SHUTOFF.~~ "EMERGENCY FUEL SHUTOFF." Signs shall be provided in approved locations.

(D) **Section 2204 Dispensing operations**

(1) **2204.1 Supervision of dispensing.** The dispensing of fuel at motor fuel-dispensing facilities shall be conducted by a qualified attendant or shall be under the supervision of a qualified attendant at all times or shall be in accordance with *paragraph* (D)(3)(2204.3) *of this rule*.

(2) **2204.2 Attended self-service motor fuel-dispensing facilities.** Attended self-service motor fuel-dispensing facilities shall comply with *paragraphs* (D)(2)(a)(2204.2.1) *to* (D)(2)(e)(2204.2.5) *of this rule, NFPA 30A as listed in division* (A) *of section 3741.14 of the Revised Code, and the "Occupational Safety and Health Act of 1970" and any amendments thereto or standards as may be adopted by the fire marshal pursuant to division (B) of section 3741.14 of the Revised Code*. Attended self-service motor fuel-dispensing facilities shall have at least one qualified attendant on duty while the facility is open for business. The attendant's primary function shall be to supervise, observe and control the dispensing of fuel. The attendant shall prevent the dispensing of fuel into containers that do not comply with *paragraph* (D)(4)(a)(2204.4.1) *of this rule*, control sources of ignition, give immediate attention to accidental spills or releases, and be prepared to use fire extinguishers.

(a) **2204.2.1 Special-type dispensers.** Special-dispensing devices and systems such as, but not limited to, card- or coin-operated and remote-preset types, are allowed at *attended self-service* motor fuel-dispensing facilities provided there is at least one qualified attendant on duty while the facility is open to the public. Remote preset-type devices shall be set in the "off" position while not in use so that the dispenser cannot be activated without the knowledge of the attendant.

(b) **2204.2.2 Emergency controls.** Emergency controls shall be provided in accordance with *paragraph* (C)(2)(2203.2) *of this rule*.

(c) **2204.2.3 Operating instructions.** *Signs providing* dispenser operating instructions shall be conspicuously posted in approved locations on every dispenser.

(d) **2204.2.4 Obstructions to view.** Dispensing devices shall be in clear view of the attendant at all times. Obstructions shall not be placed between the dispensing area and the attendant.

(e) **2204.2.5 Communications.** The attendant shall be able to communicate with persons in the dispensing area at all times. A *telephone or other* approved method of communicating with the fire department shall be provided for the attendant.

(f) ***2204.2.6 Smoking prohibited.*** *Gasoline and other flammable or combustible liquids shall be dispensed only by a person who is not smoking. Smoking shall be prohibited in the dispensing area.*

(g) ***2204.2.7 Signage.*** *A sign in block letters at least four inches in height shall be conspicuously displayed on each gasoline pump island where self-service is offered stating that it is a self-service island.*

(h) ***2204.2.8 Signage material.*** *All signs required by paragraphs (D)(2)(c)(2204.2.3), (D)(2)(g)(2204.2.7) and (D)(3)(e)(2204.3.5) of this rule shall be constructed of rigid, weather-resistant material.*

(i) ***2204.2.9 Attendant training.*** *It shall be the responsibility of the operator of the motor fuel dispensing facility to see that all attendant employees are properly trained in handling emergencies of a flammable fuel type.*

(j) ***2204.2.10 Codes and standards.*** *It shall be the responsibility of the operator of the motor fuel dispensing facility to see that all attendant employees read and be familiar with applicable codes and standards.*

(k) ***2204.2.11 Dispensing devices.*** *Existing listed or labeled dispensing devices shall be permitted to be modified provided that the modifications made are "Listed by Report" by an approved testing laboratory or as otherwise approved by the fire code official. Modification proposals shall contain a description of the component parts used in the modification and the recommended methods of installation on specific dispensing devices. Modification proposals shall be made available to the fire code official upon request.*

(l) ***2204.2.12 Dispenser activation.*** *Dispensing devices shall not be operated by the customer until activated by the attendant. The attendant shall authorize each individual sale and shall activate the dispensing device only after such authorization.*

(3) **2204.3 Unattended self-service motor fuel-dispensing facilities.** Unattended self-service motor fuel-dispensing facilities shall comply with *paragraphs* (D)(3)(a)(2204.3.1) *to* (D)(3)(g)(2204.3.7) *of this rule, NFPA 30A as listed in division* (A) *of section 3741.14 of the Revised Code and the "Occupational Safety and Health Act of 1970" and any amendments thereto or standards as may be adopted by the fire marshal pursuant to division (B) of section 3741.14 of the Revised Code. This paragraph shall not apply to an unattended fleet vehicle motor fuel dispensing facility.*

(a) **2204.3.1 General.** Where approved, unattended self-service motor fuel-dispensing facilities are allowed. As a condition of approval, the owner or operator shall provide, and be accountable for, daily site visits, regular equipment inspection and maintenance.

(b) **2204.3.2 Dispensers.** Dispensing devices shall comply with *paragraph* (F)(7)(2206.7) *of this rule. Only card operated dispensing devices approved by authoritative sources listed in rule 1301:7-7-01 of the Administrative Code shall*

be used. Dispensing devices operated by the insertion of coins or currency shall not be used unless approved. *Approved key- or card-operated dispensing devices may be activated by the customer with the use of an authorized key or card.*

(c) **2204.3.3 Emergency controls.** Emergency controls shall be provided in accordance with *paragraph* (C)(2)(2203.2) *of this rule*. Emergency controls shall be of a type which is only manually resettable.

(d) **2204.3.4 Operating instructions.** Dispenser operating instructions shall be conspicuously posted in approved locations on every dispenser and shall indicate the location of the emergency controls required by *paragraph* (D)(3)(c)(2204.3.3) *of this rule*.

(e) **2204.3.5 Emergency procedures.** An approved emergency procedures sign, in addition to the signs required by *paragraph* (E)(6)(2205.6) *of this rule*, shall be posted in a conspicuous location and shall read:

~~IN CASE OF FIRE, SPILL OR RELEASE~~

~~1. USE EMERGENCY PUMP SHUTOFF~~

~~2. REPORT THE ACCIDENT!~~

~~FIRE DEPARTMENT TELEPHONE NO. _____~~

~~FACILITY ADDRESS _____~~

"IN CASE OF FIRE, SPILL OR RELEASE

1. USE EMERGENCY PUMP SHUTOFF

2. REPORT THE ACCIDENT!

FIRE DEPARTMENT TELEPHONE NO. _____

FACILITY ADDRESS _____"

(f) **2204.3.6 Communications.** A telephone not requiring a coin to operate or other approved, clearly identified means to notify the fire department shall be provided on the site in a location approved by the fire code official.

(g) **2204.3.7 Quantity limits.** Dispensing equipment used at unsupervised locations shall comply with one of the following:

(i) Dispensing devices shall be programmed or set to limit uninterrupted fuel delivery to 25 gallons (95 L) and require a manual action to resume delivery.

(ii) The amount of fuel being dispensed shall be limited *to an approved* quantity by a preprogrammed card.

(h) ***2204.3.8 Spill containment.*** *Containment of small spills shall be controlled by grading the pavement away from the building and scoring the pavement or may be done by the use of an oil/water separator.*

(i) ***2204.3.9 Dispensing devices.*** *Existing listed or labeled dispensing devices shall be permitted to be modified provided that the modifications made are "Listed by Report" by an approved testing laboratory or as otherwise approved by the fire code official. Modification proposals shall contain a description of the component parts used in the modification and the recommended methods of installation on specific dispensing devices. Modification proposals shall be made available to the fire code official upon request.*

(j) ***2204.3.10 Smoking prohibited.*** *Gasoline and other flammable or combustible liquids shall be dispensed only by a person who is not smoking. Smoking shall be prohibited in the dispensing area.*

(k) ***2204.3.11 Additional fire protection required.*** *Additional fire protection where required by the fire code official, shall include automatic fixed suppression systems, and automatic fire detection, and transmission of an alarm to an off-site location approved by the fire code official.*

(l) ***2204.3.12 Signage.*** *Signs shall be provided in accordance with ~~paragraph~~ paragraphs* (D)(2)(c)(2204.2.3), (D)(2)(g)(2204.2.7*) and* (D)(3)(e)(2204.3.5) *of this rule.*

(m) ***2204.3.13 Signage material.*** *All signs required by paragraph* (D)(3)(l)(2204.3.12) *of this rule shall be constructed of rigid, weather-resistant material.*

(4) **2204.4 Dispensing into portable containers.** The dispensing of flammable or combustible liquids into portable containers shall comply with *paragraphs* (D)(4)(a)(2204.4.1) *to* (D)(4)(c)(2204.4.3) *of this rule*.

(a) **2204.4.1 Approved containers required.** Class I, II and IIIA liquids shall not be dispensed into a portable container unless such container is *properly constructed of metal or other material* approved *by the fire code official*, and has a tight closure with screwed or spring-loaded cover so designed that the contents can be dispensed without spilling. Liquids shall not be dispensed into portable tanks or cargo tanks.

(b) **2204.4.2 Nozzle operation.** A hose nozzle valve used for dispensing Class I liquids into a portable container shall be in compliance with *paragraph* (F)(7)(f)(2206.7.6) *of this rule.* No person shall utilize the automatic latch-open device during the dispensing operation.

(c) **2204.4.3 Location of containers being filled.** Portable containers shall not be filled while located inside the trunk, passenger compartment or truck bed of a vehicle.

(E) **Section 2205 Operational requirements**

(1) **2205.1 Tank filling operations for Class I, II or IIIA liquids.** Delivery operations to tanks for Class I, II or IIIA liquids shall comply with *paragraphs* (E)(1)(a)(2205.1.1) *to* (E)(1)(c)(2205.1.3) *of this rule* and the applicable requirements of *rule 1301:7-7-34 of the Administrative Code*.

(a) **2205.1.1 Delivery vehicle location.** Where liquid delivery to above-ground storage tanks is accomplished by positive-pressure operation, tank vehicles shall be positioned a minimum of 25 feet (7620 mm) from tanks receiving Class I liquids and 15 feet (4572 mm) from tanks receiving Class II and IIIA liquids.

(b) **2205.1.2 Tank capacity calculation.** The driver, operator or attendant of a tank vehicle shall, before making delivery to a tank, determine the unfilled, available capacity of such tank *in accordance with accepted industry practices*.

(c) **2205.1.3 Tank fill connections.** Delivery of flammable liquids to tanks more than 1,000 gallons (3785 L) in capacity shall be made by means of approved liquid- and vapor-tight connections between the delivery hose and tank fill pipe. Where tanks are equipped with any type of vapor recovery system, all connections required to be made for the safe and proper functioning of the particular vapor recovery process shall be made. Such connections shall be made liquid and vapor tight and remain connected throughout the unloading process. Vapors shall not be discharged at grade level during delivery.

(2) **2205.2 Equipment maintenance and inspection.** Motor fuel-dispensing facility equipment shall be maintained in proper working order at all times in accordance with *paragraphs* (E)(2)(a)(2205.2.1) *to* (E)(2)(c)(2205.2.3) *of this rule*.

(a) **2205.2.1 Dispensing devices.** Where maintenance to Class I liquid dispensing devices becomes necessary and such maintenance could allow the accidental release or ignition of liquid, the following precautions shall be taken before such maintenance is begun:

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

(ii) Electrical power to the dispensing device and pump serving the dispenser shall be shut off at the main electrical disconnect panel.

(iii) The emergency shutoff valve at the dispenser, where installed, shall be closed.

(iv) Vehicle traffic and unauthorized persons shall be prevented from coming within 12 feet (3658 mm) of the dispensing device.

(b) **2205.2.2 Emergency shutoff valves.** Automatic ~~closing~~ emergency shutoff valves required by *paragraph* (F)(7)(d)(2206.7.4) *of this rule* shall be checked not less than once per year by manually tripping the hold-open linkage.

(c) **2205.2.3 Leak detectors.** Leak detection devices required by *paragraph* (F)(7)(g)(i)(2206.7.7.1) *of this rule* shall be checked and tested at least annually in accordance with the manufacturer's specifications to ensure proper installation and operation.

(3) **2205.3 Spill control.** Provisions shall be made to prevent liquids spilled during dispensing operations from flowing into buildings. Acceptable methods include, but shall not be limited to, grading driveways, raising doorsills, or other approved means.

(4) **2205.4 Sources of ignition.** Smoking and open flames shall be prohibited in areas where fuel is dispensed. The engines of vehicles being fueled shall be shut off during fueling. Electrical equipment shall be in accordance with the *building code and NFPA 70 as listed in rule 1301:7-7-45 of the Administrative Code*.

(5) **2205.5 Fire extinguishers.** Portable fire extinguishers complying with *paragraph* (F)(906) *of rule 1301:7-7-09 of the Administrative Code* with a minimum rating of 2-A:20-B:C shall be provided and located such that an extinguisher is not more than 75 feet (22 860 mm) from pumps, dispensers or storage tank fill-pipe openings.

(6) **2205.6 Warning signs.** Warning signs shall be conspicuously posted within sight of each dispenser in the fuel-dispensing area which indicate the following:

(a) ~~It is illegal and dangerous to fill unapproved containers with fuel.~~ No smoking.

(b) ~~Smoking is prohibited.~~ Shut off motor.

(c) ~~The engine shall be shut off during the refueling process.~~ Discharge your static electricity before fueling by touching a metal surface away from the nozzle.

(d) ~~Portable containers shall not be filled while located inside the trunk, passenger compartment, or truck bed of a vehicle.~~ To prevent static charge, do not reenter your vehicle while gasoline is pumping.

(e) If a fire starts, do not remove nozzle-back away immediately.

(f) It is unlawful and dangerous to dispense gasoline into unapproved containers.

(g) No filling of portable containers in or on a motor vehicle. Place container on ground before filling.

~~(e)~~ (h) *Persons using dispensers with hold-open latches must remain at the refueling point during refueling.*

(7) **2205.7 Control of brush and debris.** Fenced and diked areas surrounding above-ground tanks shall be kept free from vegetation, debris and other material that is not necessary to the proper operation of the tank and piping system.

Weeds, brush, trash and other combustible materials shall be kept not less than 10 feet (3048 mm) from fuel-handling equipment.

(F) **Section 2206 Flammable and combustible liquid motor fuel-dispensing facilities**

(1) **2206.1 General.** Storage of flammable and combustible liquids shall be in accordance with *rule 1301:7-7-34 of the Administrative Code* and this *paragraph*.

(2) **2206.2 Method of storage.** Approved methods of storage for Class I, II and IIIA *flammable or combustible liquids* at motor fuel-dispensing facilities *to which the public does not have access*, shall be in accordance with *paragraphs* (F)(2)(a)(2206.2.1) *to* (F)(2)(e)(2206.2.5) *of this rule*. *At motor fuel-dispensing facilities to which the public has access the only approved method of storage shall be in accordance with paragraph* (F)(2)(a)(2206.2.1) *of this rule.*

Exception: *Where approved by the fire code official in accordance with paragraph* ~~(I)(1)(2209.1)~~ *(J)(1)(2210.1) of this rule, the approved method of storage of Class I, II and IIIA flammable or combustible liquids at marine motor fuel-dispensing facilities shall be in accordance with paragraphs* (F)(2)(a)(2206.2.1) *to* (F)(2)(f)(2206.2.6) *of this rule.*

(a) **2206.2.1 Underground tanks.** Underground tanks for the storage of Class I, II and IIIA liquid motor fuels shall comply with *rule 1301:7-7-34 of the Administrative Code*.

(i) **2206.2.1.1 Inventory control for underground tanks.** Accurate daily inventory records shall be maintained and reconciled on underground fuel storage tanks for indication of possible leakage from tanks and piping. The records shall be kept at the premises or made available for inspection by the fire code official within 24 hours of a written or verbal request and shall include records for each product showing daily reconciliation

between sales, use, receipts and inventory on hand. Where there is more than one system consisting of tanks serving separate pumps or dispensers for a product, the reconciliation shall be ascertained separately for each tank system. A consistent or accidental loss of product shall be immediately reported to the fire code official.

(b) **2206.2.2 Above-ground tanks located inside buildings.** Above-ground tanks for the storage of Class I, II and IIIA liquid fuels are allowed to be located in buildings. Such tanks shall be located in special enclosures complying with *paragraph* (F)(2)(f)(2206.2.6) *of this rule*, in a liquid storage room or a liquid storage warehouse complying with *rule 1301:7-7-34 of the Administrative Code*, or shall be listed and labeled as protected above-ground tanks.

(c) **2206.2.3 Above-ground tanks located outside, above grade.** Above-ground tanks shall not be used for the storage of Class I, II or IIIA liquid fuels except as provided. *Existing aboveground tank installations, even if previously approved, that are determined to constitute a hazard by the fire code official shall not be continued in service. Unsafe tanks shall be removed as required by the fire code official and in accordance with this code.*

(i) Above-ground tanks used for outside, above-grade storage of Class I liquids shall be listed and labeled as protected above-ground tanks and be in accordance with *rule 1301:7-7-34 of the Administrative Code*. Such tanks shall be located in accordance with Table 2206.2.3 *of this rule*.

Exception: An aboveground tank approved by an authoritative source listed in rule 1301:7-7-01 of the Administrative Code as a fire resistant tank may be utilized in lieu of a protected tank when installed in accordance with Table 2206.2.3 of this rule.

(ii) Above-ground tanks used for above-grade storage of Class II or IIIA liquids are allowed to be protected above-ground tanks or, when approved by the fire code official, other above-ground tanks that comply with *rule 1301:7-7-34 of the Administrative Code*. Tank locations shall be in accordance with Table 2206.2.3 *of this rule*.

(iii) Tanks containing fuels shall not exceed 12,000 gallons (45 420 L) in individual capacity or 48,000 gallons (181 680 L) in aggregate capacity. Installations with the maximum allowable aggregate capacity shall be separated from other such installations by not less than 100 feet (30 480 mm).

(iv) Tanks located at *areas used for agricultural purposes and* construction projects shall comply with *paragraph* (F)(2)(3406.2) *of rule 1301:7-7-34 of the Administrative Code*.

Table 2206.2.3
Minimum separation requirements for above-ground tanks

Class of liquid and tank type	Individual tank capacity (gallons)	Minimum distance from nearest important building on same property (feet)	Minimum distance from nearest fuel dispenser (feet)	Minimum distance from lot line which is or can be built upon, including the opposite side of a public way (feet)	Minimum distance from nearest side of any public way (feet)	Minimum distance between tanks (feet)
Class I protected above ground tanks[b]	Less than or equal to 6,000	5	25[a]	15	5	3
~~Or tanks in vaults~~	Greater than 6,000	15	25[a]	25	15	3
Class II and III protected above ground tanks ~~or tanks in vaults~~[b]	Same as Class I	Same as Class I	Same as Class I	Same as Class I	Same as Class I	Same as Class I
Tanks in vaults	0-20,000	0[b]	0	0[b]	0	Separate compartment for each tank
Other tanks	All	50	50	100	50	3

For SI: 1 foot = 304.8 mm, 1 gallon = 3.785 L.

a. At fleet vehicle motor fuel-dispensing facilities, no minimum separation distance is required.
b. A fire resistant tank may be utilized in lieu of a protected tank when approved by the fire code official and installed in accordance with the distance requirements of NFPA 30A as listed in rule 1301:7-7-45 of the Administrative Code.

(d) **2206.2.4 Above-ground tanks located in above-grade vaults or below-grade vaults.** Above-ground tanks used for storage of Class I, II or IIIA liquid fuels are allowed to be installed in vaults located above grade or below grade in accordance with *paragraph* (D)(2)(h)(3404.2.8) *of rule 1301:7-7-34 of the Administrative Code* and shall comply with *paragraphs* (F)(2)(d)(i)(2206.2.4.1) and ~~(F)(2)(d)(i)(2206.2.4.1)~~ (F)(2)(d)(ii)(2206.2.4.2) *of this rule*. Tanks in above-grade vaults shall also comply with Table 2206.2.3 *of this rule*.

(i) **2206.2.4.1 Tank capacity limits.** Tanks storing Class I and Class II liquids at an individual site shall be limited to a maximum individual capacity of 15,000 gallons (56 776 L) and an aggregate capacity of 48,000 gallons (181 680 L).

(ii) **2206.2.4.2 Fleet vehicle motor fuel-dispensing facilities.** Tanks storing Class II and Class IIIA liquids at a fleet vehicle motor fuel-dispensing facility shall be limited to a maximum individual fueling capacity of 20,000 gallons (75 700 L) and an aggregate capacity of 80,000 gallons (302 800 L).

(e) **2206.2.5 Portable tanks.** Where approved by the fire code official, portable tanks are allowed to be temporarily used in conjunction with the dispensing of Class I, II or IIIA liquids into the fuel tanks of motor vehicles or motorized equipment on premises not normally accessible to the public. The approval shall include a definite time limit.

(f) **2206.2.6 Special enclosures.** Where installation of tanks in accordance with *paragraph* (D)(2)(k)(3404.2.11) *of rule 1301:7-7-34 of the Administrative Code* is impractical, or because of property or building limitations, tanks for liquid fuels are allowed to be installed in buildings in special enclosures in accordance with all of the following:

(i) The special enclosure shall be liquid tight and vapor tight.

(ii) The special enclosure shall not contain backfill.

(iii) Sides, top and bottom of the special enclosure shall be of reinforced concrete at least 6 inches (152 mm) thick, with openings for inspection through the top only.

(iv) Tank connections shall be piped or closed such that neither vapors nor liquid can escape into the enclosed space between the special enclosure and any tanks inside the special enclosure.

(v) Means shall be provided whereby portable equipment can be employed to discharge to the outside any vapors which might accumulate inside the special enclosure should leakage occur.

(vi) Tanks containing Class I, II or IIIA liquids inside a special enclosure shall not exceed 6,000 gallons (22 710 L) in individual capacity or 18,000 gallons (68 130 L) in aggregate capacity.

(vii) Each tank within special enclosures shall be surrounded by a clear space of not less than 3 feet (910 mm) to allow for maintenance and inspection.

(3) **2206.3 Security.** Aboveground tanks for the storage of liquid fuels shall be safeguarded from public access or unauthorized entry in *accordance with Section 4-3.7.1 of NFPA 30A as listed in rule 1301:7-7-45 of the Administrative Code*.

(4) **2206.4 Physical protection.** Guard posts complying with *paragraph* (L)(312) *of rule 1301:7-7-03 of the Administrative Code* or other approved means shall be provided to protect above-ground tanks against impact by a motor vehicle unless the tank is listed as a protected above-ground tank with vehicle impact protection.

(5) **2206.5 Secondary containment.** Above-ground tanks shall be provided with drainage control or diking in accordance with *rule 1301:7-7-34 of the Administrative Code*. Drainage control and diking is not required for listed secondary containment tanks. Secondary containment systems shall be monitored either visually or automatically. Enclosed secondary containment systems shall be provided with emergency venting in accordance with *paragraph* (F)(6)(b)(v)(2206.6.2.5) *of this rule*.

(6) **2206.6 Piping, valves, fittings and ancillary equipment for use with flammable or combustible liquids.** The design, fabrication, assembly, testing and inspection of piping, valves, fittings and ancillary equipment for use with flammable or combustible liquids shall be in accordance with *rule 1301:7-7-34 of the Administrative Code* and *paragraphs* (F)(6)(a)(2206.6.1) *to* (F)(6)(c)(2206.6.3) *of this rule*.

(a) **2206.6.1 Protection from damage.** Piping shall be located such that it is protected from physical damage.

(b) **2206.6.2 Piping, valves, fittings and ancillary equipment for above-ground tanks for Class I, II and IIIA liquids.** Piping, valves, fittings and ancillary equipment for above-ground tanks shall comply with *paragraphs* (F)(6)(b)(i)(2206.6.2.1) *to* (F)(6)(b)(vi)(2206.6.2.6) *of this rule*.

(i) **2206.6.2.1 Tank openings.** Tank openings for above-ground tanks shall be through the top only.

(ii) **2206.6.2.2 Fill-pipe connections.** The fill pipe for above-ground tanks shall be provided with a means for making a direct connection to the tank vehicle's fuel-delivery hose so that the delivery of fuel is not exposed to the open air during the filling operation. Where any portion of the fill pipe exterior to the tank extends below the level of the top of the tank, a check valve shall be installed in the fill pipe not more than 12 inches (305 mm) from the fill-hose connection.

(iii) **2206.6.2.3 Overfill protection.** Overfill protection shall be provided for above-ground flammable and combustible liquid storage tanks in accordance with *paragraphs* (D)(2)(g)(v)*(h)*(3404.2.7.5.8) and (D)(2)(i)(vi)*(f)*(3404.2.9.6.6) *of rule 1301:7-7-34 of the Administrative Code*.

(iv) **2206.6.2.4 Siphon prevention.** An approved antisiphon method shall be provided in the piping system to prevent flow of liquid by siphon action.

(v) **2206.6.2.5 Emergency relief venting.** Above-ground storage tanks, tank compartments and enclosed secondary containment spaces shall be provided with emergency relief venting in accordance with *rule 1301:7-7-34 of the Administrative Code*.

(vi) **2206.6.2.6 Spill containers.** A spill container having a capacity of not less than 5 gallons (19 L) shall be provided for each fill connection. For tanks with a top fill connection, spill containers shall be noncombustible and shall be fixed to the tank and equipped with a manual drain valve that drains into the primary tank. For tanks with a remote fill connection, a portable spill container is allowed.

(c) **2206.6.3 Piping, valves, fittings and ancillary equipment for underground tanks.** Piping, valves, fittings and ancillary equipment for underground tanks shall comply with *rule 1301:7-7-34 of the Administrative Code* and NFPA 30A *as listed in rule 1301:7-7-45 of the Administrative Code*.

(7) **2206.7 Fuel-dispensing systems for flammable or combustible liquids.** The design, fabrication and installation of fuel-dispensing systems for flammable or combustible liquid fuels shall be in accordance with ~~this *paragraph*~~ *paragraphs* (F)(7)(a)(2206.7.1) *to* (F)(7)(i)(ii)(*d*)(2206.7.9.2.4) *of this rule*.

(a) **2206.7.1 Listed equipment.** Electrical equipment, dispensers, hose, nozzles and submersible or subsurface pumps used in fuel-dispensing systems shall be listed.

(b) **2206.7.2 Fixed pumps required.** Class I 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.

(c) **2206.7.3 Mounting of dispensers.** Dispensing devices except those installed on top of a protected above-ground tank that qualifies as vehicle-impact resistant, shall be protected against physical damage by mounting on a concrete island 6 inches (152 mm) or more in height, or shall otherwise be suitably protected in accordance with *paragraph* (L)(312) *of rule 1301:7-7-03 of the Administrative Code*. Dispensing devices shall be installed and securely fastened to their mounting surface in accordance with the dispenser manufacturer's instructions. Dispensing devices installed indoors shall be located in an approved position where they cannot be struck by an out-of-control vehicle descending a ramp or other slope.

(d) **2206.7.4 Dispenser emergency valve.** An approved automatic emergency shutoff valve designed to close ~~automatically~~ in the event of a fire or impact shall be properly installed in the liquid supply line at the base of each dispenser supplied by a remote pump. The valve shall be installed so that the shear groove is flush with or within 0.5 inch (12.7 mm) of the top of the concrete dispenser island and there is clearance provided for maintenance purposes around the valve body and

operating parts. The valve shall be installed at the liquid supply line inlet of each overhead-type dispenser. Where installed, a vapor return line located inside the dispenser housing shall have a shear section or approved flexible connector for the liquid supply line emergency shutoff valve to function. Emergency shutoff valves shall be installed and maintained in accordance with the manufacturer's instructions, tested at the time of initial installation and tested at least yearly thereafter in accordance with *paragraph* (E)(2)(b)(2205.2.2) *of this rule*.

(e) **2206.7.5 Dispenser hose.** Dispenser hoses shall be a maximum of 18 feet (5486 mm) in length unless otherwise approved. Dispenser hoses shall be approved. When not in use, hoses shall be reeled, racked or otherwise protected from damage.

(i) **2206.7.5.1 Breakaway devices.** Dispenser hoses for Class I and II liquids shall be equipped with a listed emergency breakaway device designed to retain liquid on both sides of a breakaway point. Such devices shall be installed and maintained in accordance with the manufacturer's instructions. Where hoses are attached to hose-retrieving mechanisms, the emergency breakaway device shall be located between the hose nozzle and the point of attachment of the hose-retrieval mechanism to the hose.

(f) **2206.7.6 Fuel delivery nozzles.** A listed automatic-closing-type hose nozzle valve with or without a latch-open device shall be provided on island-type dispensers used for dispensing Class I, II or IIIA liquids.

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

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

(i) **2206.7.6.1 Special requirements for nozzles.** Where dispensing of Class I, II or IIIA liquids is performed, a listed automatic-closing-type hose nozzle valve shall be used incorporating *one of* the following features:

(a) The hose nozzle valve shall be equipped with an integral latch-open device.

(b) When the flow of product is normally controlled by devices or equipment other than the hose nozzle valve, the hose nozzle valve shall not be capable of being opened unless the delivery hose is pressurized. If pressure to the hose is lost, the nozzle shall close automatically.

Exception: Vapor recovery nozzles incorporating insertion interlock devices designed to achieve shutoff on disconnect from the vehicle fill pipe.

(c) The hose nozzle shall be designed such that the nozzle is retained in the fill pipe during the filling operation.

(d) The system shall include listed equipment with a feature that causes or requires the closing of the hose nozzle valve before the product flow can be resumed or before the hose nozzle valve can be replaced in its normal position in the dispenser.

(g) **2206.7.7 Remote pumping systems.** Remote pumping systems for liquid fuels shall comply with *paragraphs* (F)(7)(g)(i)(2206.7.7.1) and (F)(7)(g)(ii)(2206.7.7.2*) of this rule*.

(i) **2206.7.7.1 Leak detection.** Where remote pumps are used to supply fuel dispensers, each pump shall have installed on the discharge side a listed leak detection device that will detect a leak in the piping and provide an indication *to alert the operator of the presence of a leak*. A leak detection device is not required if the piping from the pump discharge to under the dispenser is above ground and visible.

(ii) **2206.7.7.2 Location.** Remote pumps installed above grade, outside of buildings, shall be located not less than 10 feet (3048 mm) from lines of adjoining property that can be built upon and not less than 5 feet (1524 mm) from any building opening. Where an outside pump location is impractical, pumps are permitted to be installed inside buildings as provided for dispensers in *paragraph* (A)(4)(2201.4) *of this rule* and *rule 1301:7-7-34 of the Administrative Code*. Pumps shall be substantially anchored and protected against physical damage.

(h) **2206.7.8 Gravity and pressure dispensing.** Flammable liquids shall not be dispensed by gravity from tanks, drums, barrels or similar containers. Flammable or combustible liquids shall not be dispensed by a device operating through pressure within a storage tank, drum or container.

(i) **2206.7.9 Vapor-recovery and vapor-processing systems**. Vapor-recovery and vapor-processing systems shall be in accordance with ~~*paragraph*~~ *paragraphs* (F)(7)(i)(2206.7.9) *to* (F)(7)(i)(ii)(*d*)(2206.7.9.2.4) *of this rule*.

(i) **2206.7.9.1 Vapor-recovery systems.** ***Vapor recovery systems are systems designed to capture and retain, without processing, vapors displaced during transfer or filling operations.*** Vapor-*recovery* systems shall

comply with *paragraphs* (F)(7)(i)(i)*(a)*(2206.7.9.1.1) *to* (F)(7)(i)(i)*(e)*(2206.7.9.1.5) *of this rule*.

(a) **2206.7.9.1.1 Dispensing devices.** Dispensing devices incorporating provisions for vapor recovery shall be listed and labeled. When existing listed or labeled dispensing devices are modified for vapor recovery, such modifications shall be listed by report by a nationally recognized testing *laboratory or by an authoritative source listed in of rule 1301:7-7-01 of the Administrative Code*. The listing by report shall contain a description of the component parts used in the modification and recommended method of installation on specific dispensers. Such report shall be made available on request of the fire code official.

(b) **2206.7.9.1.2 Vapor-return line closeoff.** A *means* shall be provided to *prevent the discharge of vapor* from dispensers when the product is not being dispensed.

(c) **2206.7.9.1.3 Piping.** Piping in vapor-*recovery* systems shall be in accordance with *paragraphs* (C)(6)(3403.6) *of rule 1301:7-7-34 of the Administrative Code*. Nonmetallic piping shall be installed in accordance with the manufacturer's installation instructions.

Vent piping shall be in accordance with *paragraphs* (C)(6)(3403.6) and (D)(2)(3404.2) *of rule 1301:7-7-34 of the Administrative Code*. Vapor return piping shall be installed in a manner that drains back to the tank, without sags or traps in which liquid can become trapped. If necessary, because of grade, condensate tanks are allowed in vapor return piping. Condensate tanks shall be designed and installed so that they can be drained without opening.

(d) **2206.7.9.1.4 Flexible joints and shear joints.** Flexible joints shall be installed in accordance with *paragraph* (C)(6)(i)(3403.6.9) *of rule 1301:7-7-34 of the Administrative Code*.

An approved shear joint shall be rigidly mounted and connected by a union in the vapor return piping at the base of each dispensing device. The shear joint shall be mounted flush with the top of the surface on which the dispenser is mounted.

(e) **2206.7.9.1.5 Testing.** Vapor return lines and vent piping shall be tested in accordance with *paragraph* (C)(6)(c)(3403.6.3) *of rule 1301:7-7-34 of the Administrative Code*.

(ii) **2206.7.9.2 Vapor-processing systems.** ***Vapor processing systems are systems designed to capture and process vapors displaced during***

transfer or filling operations by use of mechanical or chemical means. Vapor-processing systems shall comply with *paragraphs* (F)(7)(i)(ii)*(a)*(2206.7.9.2.1) *to* (F)(7)(i)(ii)*(d)*(2206.7.9.2.4) *of this rule*.

(a) **2206.7.9.2.1 Equipment.** Equipment in vapor-processing systems, including hose nozzle valves, vapor pumps, flame arresters, fire checks or systems for prevention of flame propagation, controls and vapor-processing equipment, shall be individually listed for the intended use in a specified manner.

Vapor-processing systems that introduce air into the underground piping or storage tanks shall be provided with equipment for prevention of flame propagation that has been tested and listed as suitable for the intended use.

(b) **2206.7.9.2.2 Location.** Vapor-processing equipment shall be located at or above grade. Sources of ignition shall be located not less than *20* feet (*6096* mm) from fuel-transfer areas and not less than 18 inches (457 mm) above tank fill openings and tops of dispenser islands. Vapor-processing units shall be located not less than 10 feet (3048 mm) from the nearest building or lot line of a property which can be built upon.

Exception: Where the required distances to buildings, lot lines or fuel-transfer areas cannot be obtained, means shall be provided to protect equipment against fire exposure. Acceptable means shall include but not be limited to:

1. Approved protective enclosures, which extend at least 18 inches (457 mm) above the equipment, constructed of fire-resistant or noncombustible materials; or

2. Fire protection using an approved water-spray system.

Vapor-processing equipment shall be located a minimum of 20 feet (6096 mm) from dispensing devices. Processing equipment shall be protected against physical damage by guardrails, curbs, protective enclosures or fencing. Where approved protective enclosures are used, approved means shall be provided to ventilate the volume within the enclosure to prevent pocketing of flammable vapors.

Where a downslope exists toward the location of the vapor-processing unit from a fuel-transfer area, the fire code official is authorized to require additional separation by distance and height.

(c) **2206.7.9.2.3 Installation.** Vapor-processing units shall be securely mounted on concrete masonry or structural steel supports on concrete or other noncombustible foundations. Vapor-processing equipment is allowed to be installed on roofs when approved.

(d) **2206.7.9.2.4 Piping.** Piping *for vapor processing systems* shall be in accordance with *paragraph* (C)(6)(3403.6) *of rule 1301:7-7-34 of the Administrative Code*.

(G) **Section 2207 Liquefied petroleum gas motor fuel-dispensing facilities**

(1) **2207.1 General.** Motor fuel-dispensing facilities for liquefied petroleum gas (LP-gas) fuel shall be in accordance with this *paragraph* and *rule 1301:7-7-38 of the Administrative Code*.

(2) **2207.2 Approvals.** Storage vessels and equipment used for the storage or dispensing of LP-gas shall be approved or listed in accordance with *paragraphs* (G)(2)(a)(2207.2.1) and (G)(2)(b)(2207.2.2) *of this rule*.

(a) **2207.2.1 Approved equipment.** Containers, pressure relief devices, (including pressure relief valves), pressure regulators, and piping for LP-gas shall be approved.

(b) **2207.2.2 Listed equipment.** Hoses, hose connections, vehicle fuel connections, dispensers, LP-gas pumps and electrical equipment used for LP-gas shall be listed.

(3) **2207.3 Attendants.** Motor fuel-dispensing operations shall be conducted by qualified attendants or in accordance with *paragraph* (G)(6)(2207.6) *of this rule* by persons trained in the proper handling of LP-gas.

(4) **2207.4 Location of dispensing operations and equipment.** In addition to the requirements of *paragraph* (F)(7)(2206.7) *of this rule*, the point of transfer for dispensing operations shall be 25 feet (7620 mm) or more from buildings having combustible exterior wall surfaces, buildings having noncombustible exterior wall surfaces that are not part of a 1-hour fire-resistance-rated assembly, or buildings having combustible overhangs, lot lines of property which could be built on, public streets, or sidewalks and railroads; and at least 10 feet (3048 mm) from driveways and buildings having noncombustible exterior wall surfaces that are part of a fire-resistance-rated assembly having a rating of 1 hour or more.

Exception: The point of transfer for dispensing operations need not be separated from canopies that are constructed in accordance with the *building code as listed in rule 1301:7-7-45 of the Administrative Code* and which provide weather protection for the dispensing equipment.

LP-gas containers shall be located in accordance with *rule 1301:7-7-38 of the Administrative Code*. LP-gas storage and dispensing equipment shall be located outdoors and in accordance with *paragraph* (F)(7)(2206.7) *of this rule*.

(5) **2207.5 Installation of LP-gas dispensing devices and equipment.** The installation and operation of LP-gas dispensing systems shall be in accordance with *paragraphs* (G)(5)(a)(2207.5.1) *to* (G)(5)(c)(2207.5.3) *of this rule* and *rule 1301:7-7-38 of the Administrative Code*. LP-gas dispensers and dispensing stations shall be installed in accordance with manufacturer's specifications and their listing.

(a) **2207.5.1 Valves.** A manual shutoff valve and an excess flow-control check valve shall be located in the liquid line between the pump and the dispenser inlet where the dispensing device is installed at a remote location and is not part of a complete storage and dispensing unit mounted on a common base.

An excess flow-control check valve or an emergency shutoff valve shall be installed in or on the dispenser at the point at which the dispenser hose is connected to the liquid piping. A differential backpressure valve shall be considered equivalent protection.

A listed shutoff valve shall be located at the discharge end of the transfer hose.

(b) **2207.5.2 Hoses.** Hoses and piping for the dispensing of LP-gas shall be provided with hydrostatic relief valves. The hose length shall not exceed 18 feet (5486 mm). An approved method shall be provided to protect the hose against mechanical damage.

(c) **2207.5.3 Vehicle impact protection.** Vehicle impact protection for LP-gas storage containers, pumps and dispensers shall be provided in accordance with *paragraph* (F)(4)(2206.4) *of this rule*.

(6) **2207.6 Private fueling of motor vehicles.** Self-service LP-gas dispensing systems, including key, code and card lock dispensing systems, shall not be open to the public and shall be limited to the filling of permanently mounted fuel containers on LP-gas powered vehicles.

In addition to the requirements of *paragraphs* (E)(2205) and (F)(7)(2206.7) *of this rule*, self-service LP-gas dispensing systems shall be in accordance with the following:

(a) The system shall be provided with an emergency shutoff switch located within 100 feet (30 480 mm) of, but not less than 20 feet (6096 mm) from, dispensers.

(b) The owner of the LP-gas motor fuel-dispensing facility shall provide for the safe operation of the system and the training of users.

(7) **2207.7 Overfilling.** LP-gas containers shall not be filled in excess of the fixed outage installed by the manufacturer or the weight stamped on the tank.

(H) **Section 2208 Compressed natural gas motor fuel-dispensing facilities**

(1) **2208.1 General.** Motor fuel-dispensing facilities for compressed natural gas (CNG) fuel shall be in accordance with this *paragraph* and *rule 1301:7-7-30 of the Administrative Code*.

(2) **2208.2 Approvals.** Storage vessels and equipment used for the storage, compression or dispensing of CNG shall be approved or listed in accordance with *paragraphs* (H)(2)(a)(2208.2.1) and (H)(2)(b)(2208.2.2) *of this rule*.

(a) **2208.2.1 Approved equipment.** Containers, compressors, pressure relief devices, (including pressure relief valves), and pressure regulators and piping used for CNG shall be approved.

(b) **2208.2.2 Listed equipment.** Hoses, hose connections, dispensers, gas detection systems and electrical equipment used for CNG shall be listed. Vehicle-fueling connections shall be listed and labeled.

(3) **2208.3 Location of dispensing operations and equipment.** Compression, storage and dispensing equipment shall be located above ground, outside.

Exceptions:

1. Compression, storage or dispensing equipment shall be allowed in buildings of noncombustible construction, as set forth in the *building code as listed in rule 1301:7-7-45 of the Administrative Code*, which are unenclosed for three quarters or more of the perimeter.

2. Compression, storage and dispensing equipment shall be allowed indoors or in vaults in accordance with *rule 1301:7-7-30 of the Administrative Code*.

(a) **2208.3.1 Location on property.** In addition to the requirements of *paragraph* (C)(1)(2203.1) *of this rule*, compression, storage and dispensing equipment not located in vaults complying with *rule 1301:7-7-30 of the Administrative Code* shall be installed as follows:

(i) Not beneath power lines.

(ii) Ten feet (3048 mm) or more from the nearest building or lot line which could be built on, public street, sidewalk, or source of ignition.

Exception: Dispensing equipment need not be separated from canopies that are constructed in accordance with the *building code as listed in rule 1301:7-7-45 of the Administrative Code* and which provide weather protection for the dispensing equipment.

(iii) Twenty-five feet (7620 mm) or more from the nearest rail of any railroad track and 50 feet (15 240 mm) or more from the nearest rail of any railroad main track or any railroad or transit line where power for train propulsion is provided by an outside electrical source such as third rail or overhead catenary.

(iv) Fifty feet (15 240 mm) or more from the vertical plane below the nearest overhead wire of a trolley bus line.

(4) **2208.4 Private fueling of motor vehicles.** Self-service CNG-dispensing systems, including key, code and card lock dispensing systems, shall be limited to the filling of permanently mounted fuel containers on CNG-powered vehicles.

In addition to the requirements in *paragraph* ~~(K)(2211)~~ (E)(2205) *of this rule*, the owner of a self-service CNG-dispensing facility shall ensure the safe operation of the system and the training of users.

(5) **2208.5 Pressure regulators.** Pressure regulators shall be designed and installed or protected so that their operation will not be affected by the elements (freezing rain, sleet, snow or ice), mud or debris. The protection is allowed to be an integral part of the regulator.

(6) **2208.6 Valves.** Gas piping to equipment shall be provided with a remote, readily accessible manual shutoff valve.

(7) **2208.7 Emergency shutdown ~~device~~ control.** An emergency shutdown ~~device~~ control shall be located within 75 feet (22 860 mm) of, but not less than 25 feet (7620 mm) from, dispensers, and shall also be provided in the compressor area. Upon activation, the emergency shutdown system shall automatically shut off the power supply to the compressor and close valves between the main gas supply and the compressor and between the storage containers and dispensers.

(8) **2208.8 Discharge of CNG from motor vehicle fuel storage containers.** The discharge of CNG from motor vehicle fuel cylinders for the purposes of maintenance, cylinder

certification, calibration of dispensers or other activities shall be in accordance with *paragraphs* (H)(8)(a)(2208.8.1) *to* (H)(8)(a)(ii)*(f)*(2208.8.1.2.6) *of this rule*.

(a) **2208.8.1 Methods of discharge.** The discharge of CNG from motor vehicle fuel cylinders shall be accomplished through a closed transfer system in accordance with *paragraph* (H)(8)(a)(i)(2208.8.1.1) *of this rule* or an approved method of atmospheric venting in accordance with *paragraph* (H)(8)(a)(ii)(2208.8.1.2) *of this rule*.

(i) **2208.8.1.1 Closed transfer system.** A documented procedure that explains the logical sequence for discharging the cylinder shall be provided to the fire code official for review and approval. The procedure shall include what actions the operator will take in the event of a low-pressure or high-pressure natural gas release during the discharging activity. A drawing illustrating the arrangement of piping, regulators and equipment settings shall be provided to the fire code official for review and approval. The drawing shall illustrate the piping and regulator arrangement and shall be shown in spatial relation to the location of the compressor, storage vessels and emergency shutdown devices.

(ii) **2208.8.1.2 Atmospheric venting.** Atmospheric venting of CNG shall comply with *paragraphs* (H)(8)(a)(ii)*(a)*(2208.8.1.2.1) *to* (H)(8)(a)(ii)*(f)*(2208.8.1.2.6) *of this rule*.

(a) **2208.8.1.2.1 Plans and specifications.** A drawing illustrating the location of the vessel support, piping, the method of grounding and bonding, and other requirements specified herein shall be provided to the fire code official for review and approval.

(b) **2208.8.1.2.2 Cylinder stability.** A method of rigidly supporting the vessel during the venting of CNG shall be provided. The selected method shall provide not less than two points of support and shall prevent the horizontal and lateral movement of the vessel. The system shall be designed to prevent the movement of the vessel based on the highest gas-release velocity through valve orifices at the vessel's rated pressure and volume. The structure or appurtenance shall be constructed of noncombustible materials.

(c) **2208.8.1.2.3 Separation.** The structure or appurtenance used for stabilizing the cylinder shall be separated from the site equipment, features and exposures and shall be located in accordance with Table 2208.8.1.2.3 *of this rule*.

Table 2208.8.1.2.3
Separation distance for atmospheric venting of CNG

Equipment or feature	Minimum separation (feet)
Buildings	25
Building openings	25
Lot lines	15
Public ways	15
Vehicles	25
CNG compressor and storage vessels	25
CNG dispensers	25

For SI: 1 foot = 304.8 mm.

(d) **2208.8.1.2.4 Grounding and bonding.** The structure or appurtenance used for supporting the cylinder shall be grounded in accordance with the *building code and NFPA 70 as listed in rule 1301:7-7-45 of the Administrative Code*. The cylinder valve shall be bonded prior to the commencement of venting operations.

(e) **2208.8.1.2.5 Vent tube.** A vent tube that will divert the gas flow to atmosphere shall be installed on the cylinder prior to commencement of the venting and purging operation. The vent tube shall be constructed of pipe or tubing materials approved for use with CNG in accordance with *rule 1301:7-7-30 of the Administrative Code*.

The vent tube shall be capable of dispersing the gas a minimum of 10 feet (3048 mm) above grade level. The vent tube shall not be provided with a rain cap or other feature which would limit or obstruct the gas flow.

At the connection fitting of the vent tube and the CNG cylinder, a listed bidirectional detonation flame arrester shall be provided.

(f) **2208.8.1.2.6 Signage.** "No Smoking" signs complying with *paragraph* (J)(310) *of rule 1301:7-7-03 of the Administrative Code* shall be posted within 10 feet (3048 mm) of the cylinder support structure or appurtenance. *Signs that read* "CYLINDER SHALL BE BONDED" shall be posted on the cylinder support structure or appurtenance.

(I) **Section 2209 Hydrogen motor fuel-dispensing and generation facilities**

(1) **2209.1 General.** Hydrogen motor fuel-dispensing and generation facilities shall be in accordance with this *paragraph* and *rule ~~1301:7-7-30~~ 1301:7-7-35 of the Administrative Code*. Where a fuel-dispensing facility also includes a repair garage, the repair operation shall comply with *paragraph* (K)(2211) *of this rule*.

(2) **2209.2 Equipment.** Equipment used for the generation, compression, storage or dispensing of hydrogen shall be designed for the specific application in accordance with *paragraphs* (I)(2)(a)(2209.2.1) *to paragraph* (I)(2)(c)(2209.2.3) *of this rule*.

(a) **2209.2.1 Approved equipment.** ~~Storage vessels~~ Cylinders, containers~~, pressure vessels, cylinders,~~ and tanks; pressure relief devices, including pressure ~~valves,~~ valves; hydrogen ~~vaporizers,~~ vaporizers; pressure ~~regulators~~ regulators; and piping used for gaseous hydrogen systems shall be designed and constructed in accordance with ~~*paragraph* (C)(2703) *of this rule*, NFPA 50A and NFPA 50B~~ *paragraphs* (C)(3003) *of rule 1301:7-7-30 of the Administrative Code*, (C)(3203) *of rule 1301:7-7-32 of the Administrative Code* or NFPA 55 *as listed in rule 1301:7-7-45 of the Administrative Code*.

(b) **2209.2.2 Listed equipment.** Hoses, hose connections, compressors, hydrogen generators, dispensers, detection systems and electrical equipment used for hydrogen shall be listed for use with hydrogen. Hydrogen motor fueling connections shall be listed and labeled for use with hydrogen.

(c) **2209.2.3 Electrical equipment.** Electrical installations shall be in accordance with the *building code and NFPA 70 as listed in rule 1301:7-7-45 of the Administrative Code*.

(3) **2209.3 Location on property.** In addition to the requirements of *paragraph* (C)(1)(2203.1) *of this rule*, generation, compression, storage and dispensing equipment shall be located in accordance with *paragraphs* (I)(3)(a)(2209.3.1) *to* (I)(3)(d)(2209.3.4) *of this rule*.

(a) **2209.3.1 ~~Outdoor exposures~~ Separation from outdoor exposure hazards.** ~~Outdoor exposures shall require separation~~ Generation, compression and dispensing equipment shall be separated from other fuels or equivalent risks to ~~life~~ life, safety and buildings or public areas in accordance with Table 2209.3.1 *of this rule*.

Exception: Closed systems wit a hydrogen capacity of 3,000 cubic feet or less at NTP (85 m^3).

Table 2209.3.1
Outdoor minimum separation for gaseous hydrogen dispensers, compressors, generators and storage vessels

Outdoor equipment or feature	Distance[a] (feet)
Building-noncombustible walls~~, sprinklered or nonsprinklered~~	10[b,c]
Building-combustible walls~~, sprinklered or nonsprinklered~~	25[b,~~c~~c]
~~Building-noncombustible walls, 2-hour fire barrier interrupts line-of-sight~~	~~5~~

~~Offsite~~ Public sidewalks and ~~onsite/offsite~~ parked vehicles	15~~a~~,b,c
Lot line	10~~a~~b
Air intake openings	25~~e~~d
Wall openings located less than 25 feet ~~vertically~~ above grade	20~~e~~d
Wall openings located ~~greater than~~ 25 feet ~~vertically~~ or more above grade	25d
Outdoor public assembly	25~~a~~b
Ignition source~~d~~c	10
~~Flammable~~ Above ground flammable or combustible liquid storage-~~Above ground,~~ diked in accordance with *paragraph* ~~(D)(2)(ix)(f)~~ (D)(2)(i)(vi)(3404.2.9.6) *of rule 1301:7-7-34 of the Administrative Code*, distance to dike wall	20
~~Flammable~~ Above ground flammable or combustible liquid storage-~~Above ground,~~ not diked in accordance with *paragraph* (D)(2)(i)(vi)(3404.2.9.6) *of rule 1301:7-7-34 of the Administrative Code*, distance to tank	50
~~Flammable~~ Underground flammable or combustible liquid storage-~~Below ground,~~ distance to vent or fill opening	20
Flammable gas storage (~~nonhydrogen~~ other than hydrogen)-~~Above ground,~~ with ~~common shutoff~~ emergency shutoff interconnected with the hydrogen system	25
~~Flammable~~ Above ground flammable gas storage (~~nonhydrogen~~ other than hydrogen)-~~Above ground, no common shutoff~~ without emergency shutoff interconnected with the hydrogen system	50
Combustible waste material (see *paragraph* (D)(1)(a)(304.1.1) *of rule 1301:7-7-03 of the Administrative Code*)	50b
~~Liquefied hydrogen storage distance to buildings, openings, lot lines, public ways and on-site/off-site parked vehicles~~	~~25a~~
Vertical plane of the nearest overhead electric wire of an electric trolley, train or bus line	50
Vertical plane of the nearest wire of overhead electrical power distribution lines	5

For SI: 1 foot = 304.8 mm; 1 cubic foot = 0.02832 m^3.

a. ~~Reduction of 5 feet shall be permitted where a 2-hour fire barrier interrupts the line of sight between the equipment and the exposure. The height of the barrier for vertical tanks shall be no less than one-third of the height of the tank measured vertically, and the length of the wall shall be 1.5 times the maximum diameter of the tank. The height of the barrier for vertical tanks shall be no less than one-third of the height of the tank measured vertically, and the length of the wall shall be 1.5 times the maximum diameter of the tank.~~ The applicability of tabular distance is in terms of a radius that defines a hemisphere from the source when not interrupted by an intervening fire barrier without through penetrations.

b. ~~A reduction to 0 feet shall be permitted for dispensing equipment and vehicles being refueled.~~ See *paragraph* (I)(3)(a)(i)(2209.3.1.1) *of this rule*.

c. The dispenser and point of transfer for dispensing need not be separated from canopies constructed in accordance with Section 406.5 of the building code as listed in rule 1301:7-7-45 of the Administrative Code and constructed in a manner that prevents the accumulation of hydrogen gas.

~~e.~~ d. Measured along the natural and unobstructed line of travel (e.g., around protective walls, around corners of buildings).

~~d.~~ e. Ignition ~~source. A flame, spark or hot surface capable of igniting flammable vapors or fumes. Such~~ sources include appliance burner ~~igniters and~~ igniters, hot work and hot surfaces ~~such as welding and open flames~~ capable of igniting flammable vapors.

~~e. For storage volume greater than or equal to 15,000 cubic feet at NTP.~~

(i) **2209.3.1.1 Barrier wall construction-gaseous hydrogen.** The outdoor separation shall be allowed to be reduced to 5 feet (1524) where a 2-hour fire barrier interrupts the line of sight between equipment, other than dispensers, and the exposure within the radial distance as indicated by the tabular value. The height of the barrier shall be a minimum of 6 feet (1829 mm), but not less than 1.5 times the height of the equipment, measured vertically. The length of the wall shall be not less than 1.5 times the maximum diameter or length of the tank.

(ii) **2209.3.1.2 Location of equipment.** Equipment shall be located from the enclosing walls at a distance not less than one tank diameter. When horizontal tanks are used, the distance from any one enclosing wall shall be not less than one-half the length of the tank or a minimum of 5 feet (1524 mm).

(b) **2209.3.2 Location of dispensing operations and equipment.** Generation, compression, storage and dispensing equipment shall be located outdoors, above ground.

~~**Exceptions:**~~

~~1. Generation, compression, storage or dispensing equipment shall be allowed in buildings of Type I and II construction, as defined in the *building code as listed in rule 1301:7-7-45 of the Administrative Code*, which are unenclosed for three quarters or more of the perimeter and constructed in a manner that prevents the accumulation of hydrogen gas.~~

~~2. Generation, compression, storage and dispensing equipment shall be allowed indoors in accordance with *rule 1301:7-7-30 of the Administrative Code* and as set forth in the *building code* and International Fuel Gas Code *as listed in rule 1301:7-7-45 of the Administrative Code*.~~

(i) **2209.3.2.1 Outdoors.** Generation, compression, storage or dispensing equipment shall be allowed outdoors in accordance with *paragraph* (I)(3)(a)(2209.3.1) *of this rule*.

(ii) **2209.3.2.2 Weather protection.** Generation, compression, storage or dispensing equipment shall be allowed under weather protection in accordance with the requirements of *paragraph* (D)(13)(2704.13) *of rule 1301:7-7-27 of the Administrative Code* and constructed in a manner that prevents the accumulation of hydrogen gas.

(iii) **2209.3.2.3 Indoors.** Generation, compression, storage and dispensing equipment shall be located in indoor rooms or areas constructed in accordance with the requirements of the *building code*, the International Fuel Gas Code and the *mechanical code as listed in rule 1301:7-7-45 of the Administrative Code* and one of the following:

1. Inside a building in a hydrogen cutoff room designed and constructed in accordance with Section 420 of the *building code as listed in rule 1301:7-7-45 of the Administrative Code*.

2. Inside a building not in a hydrogen cutoff room where the gaseous hydrogen system is listed and labeled for indoor installation and installed in accordance with the manufacturer's installation instructions.

3. Inside a building in a dedicated hydrogen fuel dispensing area having an aggregate hydrogen delivery capacity no greater than 12 standard cubic feet per minute (SCFM) and designed and constructed in accordance with Section 703.1 of the International Fuel Gas Code *as listed in rule 1301:7-7-45 of the Administrative Code*.

(*a*) **2209.3.2.3.1 Maintenance.** Gaseous hydrogen systems and detection devices shall be maintained in accordance with the manufacturer's instructions.

(*b*) **2209.3.2.3.2 Smoking.** Smoking shall be prohibited in hydrogen cutoff rooms. "No Smoking" signs shall be provided at all entrances to hydrogen cutoff rooms.

(*c*) **2209.3.2.3.3 Ignition source control.** Open flames, flame-producing devices and other sources of ignition shall be controlled in accordance with *rule 1301:7-7-35 of the Administrative Code*.

(*d*) **2209.3.2.3.4 Housekeeping.** Hydrogen cutoff rooms shall be kept free from combustible debris and storage.

(iv) **2209.3.2.4 Gaseous hydrogen storage.** Storage of gaseous hydrogen shall be in accordance with *rules 1301:7-7-30 and 1301:7-7-35 of the Administrative Code*.

(v) **2209.3.2.5 Liquefied hydrogen storage.** Storage of liquefied hydrogen shall be in accordance with *rule 1301:7-7-32 of the Administrative Code*.

(*a*) **2209.3.2.5.1 Location on property.** In addition to the requirements of *paragraph* (C)(1)(2203.1) *of this rule*, above-ground liquefied hydrogen storage containers, compression and vaporization equipment serving motor fuel-dispensing operations shall be located 25 feet (7620 mm) from buildings having combustible exterior wall surfaces; buildings having noncombustible exterior wall surfaces that are not part of a 1-hour fire-resistance-rated assembly; wall openings; lot lines of property that could be built on; public streets and parked vehicles.

(*i*) **2209.3.2.5.1.1 Barrier wall construction-liquefied hydrogen.** The outdoor separation distance shall be permitted to be reduced to 5 feet (1524 mm) where a 2-hour fire barrier interrupts the line of sight between equipment, other than dispensers, and the exposure within the radial distance as indicated by the tabular value. The height of the barrier shall be a minimum of 6 feet (1829 mm) but no less than 1.5 times the height of equipment, other than the cryogenic storage vessel, measured vertically. The length of the wall shall be no less than 1.5 times the maximum diameter or length of the tank. The 2-hour fire barrier shall not have more than two sides at approximately 90-degree (1.57 rad) directions, or three sides with connecting angles of approximately 135 degrees (2.36 rad). When fire barrier walls on three sides are used, piping and control systems serving stationary tanks shall be located at the open side of the enclosure created by the barrier walls.

(*ii*) **2209.3.2.5.1.2 Location of equipment.** Equipment shall be located from the enclosing walls at a distance not less than one tank diameter. When horizontal tanks are used the distance from any one enclosing wall shall be not less than one-half the length of the tank or a minimum of 5 feet (1524 mm).

(vi) **2209.3.2.6 Canopy tops.** Gaseous hydrogen compression and storage equipment located on top of motor fuel-dispensing facility canopies shall be in accordance with *paragraphs* (I)(3)(b)(vi)(a)(2209.3.2.6.1) *to*

(I)(3)(b)(vi)(c)(2209.3.2.6.3) *of this rule, rules 1301:7-7-30 and 1301:7-7-35 of the Administrative Code* and the *International Fuel Gas Code as listed in rule 1301:7-7-45 of the Administrative Code*.

(*a*) **2209.3.2.6.1 Construction.** Canopies shall be constructed in accordance with the motor fuel-dispensing facility canopy requirements of Section 406 of the *building code as listed in rule 1301:7-7-45 of the Administrative Code*.

(*b*) **2209.3.2.6.2 Fire-extinguishing systems.** Fuel-dispensing areas under canopies shall be equipped throughout with an approved automatic sprinkler system in accordance with *paragraph* (C)(3)(a)(i)(903.3.1.1) *of rule 1301:7-7-09 of the Administrative Code*. The design of the sprinkler system shall not be less than that required for Extra Hazard Group 2 occupancies. Operation of the sprinkler system shall activate the emergency functions of *paragraphs* (I)(3)(b)(vi)(*b*)(*i*)(2209.3.2.6.2.1) and (I)(3)(b)(vi)(*b*)(*ii*)(2209.3.2.6.2.2) *of this rule*.

(*i*) **2209.3.2.6.2.1 Emergency discharge.** Operation of the automatic sprinkler system shall activate an automatic emergency discharge system, which will discharge the hydrogen gas from the equipment on the canopy top through the vent pipe system.

(*ii*) **2209.3.2.6.2.2 Emergency shutdown control.** Operation of the automatic sprinkler system shall activate the emergency shutdown control required in *paragraph* (I)(5)(c)(2209.5.3) *of this rule*.

(*c*) **2209.3.2.6.3 Signage.** Approved signage having 2-inch (51 mm) block letters shall be affixed at approved locations on the exterior of the canopy structure stating: "CANOPY TOP HYDROGEN STORAGE".

(c) **2209.3.3 Canopies.** Dispensing equipment need not be separated from canopies of Type I or II construction that are constructed in a manner that prevents the accumulation of hydrogen gas and in accordance with Section 406.5 of the *building code as listed in rule 1301:7-7-45 of the Administrative Code*~~, in a manner that would prevents the accumulation of hydrogen gas~~.

~~(d) **2209.3.4 Overhead lines.** The proximity to overhead lines shall be as follows:~~

~~(i) Not less than 50 feet (15 240 mm) from the vertical plane below the nearest overhead wire of an electric trolley, train or bus line; and~~

(ii) ~~Not less than 5 feet (1524 mm) from the vertical plane below the nearest overhead electrical wire.~~

(4) **2209.4 Dispensing into motor vehicles at self-service hydrogen motor fuel-dispensing facilities.** Self-service hydrogen motor fuel-dispensing systems, including key, code and card lock dispensing systems, shall be limited to the filling of permanently mounted fuel containers on hydrogen-powered vehicles.

In addition to the requirements in *paragraph* (K)(2211) *of this rule*, the owner of a self-service hydrogen motor fuel-dispensing facility shall provide for the safe operation of the system through the institution of a fire safety plan submitted in accordance with *paragraph* (D)(404) *of rule 1301:7-7-04 of the Administrative Code*, the training of employees and operators who use and maintain the system in accordance with *paragraph* (F)(406) *of rule 1301:7-7-04 of the Administrative Code*, and provisions for hazard communication in accordance with *paragraph* (G)(407) *of rule 1301:7-7-04 of the Administrative Code*.

(5) **2209.5 Safety precautions.** Safety precautions at hydrogen motor fuel-dispensing and generation facilities shall be in accordance with *paragraphs* (I)(5)(a)(2209.5.1) *to* ~~(I)(5)(d)(iii)(2209.5.4.3)~~ (I)(5)(d)(iii)(*f*)(2209.5.4.3.6) *of this rule*.

~~(a) **2209.5.1 Valves.** Piping to equipment shall be provided with a readily accessible manual shutoff valve that is readily identifiable.~~

~~(b)~~ (a) ~~**2209.5.2**~~ **2209.5.1 Protection from vehicles.** Guard posts or other approved means shall be provided to protect hydrogen storage systems and use areas subject to vehicular damage in accordance with *paragraph* (L)(312) *of rule 1301:7-7-03 of the Administrative Code*.

(b) **2209.5.2 Emergency shutoff valves.** A manual emergency shutoff valve shall be provided to shut down the flow of gas from the hydrogen supply to the piping system.

(i) **2209.5.2.1 Identification.** Manual emergency shutoff valves shall be identified and the location shall be clearly visible, accessible and indicated by means of a sign.

(c) **2209.5.3 Emergency shutdown controls.** In addition to the manual emergency shutoff valve required by *paragraph* (I)(5)(b)(2209.5.2) *of this rule*, a remotely located, manually activated emergency shutdown control shall be provided. An emergency shutdown device shall be located within 75 feet (22 860 mm) of, but not less than 25 feet (7620 mm) from, dispensers and hydrogen generators ~~and shall also be provided in the compression area. On activation, emergency shutdown shall automatically shut off the power supply to hydrogen storage, compression, dispensing and generating equipment, shut off natural gas or other~~

~~fuel supply to the hydrogen generator, and close valves between the main supply and the compressor and between the storage containers and dispensing equipment~~.

(i) **2209.5.3.1 System requirements.** Activation of the emergency shutdown control shall automatically shut off the power supply to all hydrogen storage, compression and dispensing equipment; shut off natural gas or other fuel supply to the hydrogen generator; and close valves between the main supply and the compressor and between the storage containers and dispensing equipment.

(d) **2209.5.4 ~~Emergency venting~~ Venting of hydrogen systems.** Hydrogen systems shall be equipped with ~~venting~~ pressure relief devices that will relieve excessive internal pressure in accordance with *paragraphs* (I)(5)(d)(i)(2209.5.4.1) *to* (I)(5)(d)(iii)(f)(2209.5.4.3.6) *of this rule*. ~~Hydrogen systems shall not discharge inside buildings. All portions of the system shall be protected by pressure relieving devices.~~

(i) **2209.5.4.1 Location of discharge.** Hydrogen vented from vent pipe systems serving pressure relief devices or purging systems shall not be discharged inside buildings or under canopies used for weather protection.

(ii) **2209.5.4.2 Pressure relief devices.** Portions of the system subject to overpressure shall be protected by pressure relief devices designed and installed in accordance with the requirements of CGA S-1.1, S-1.2, S-1.3 or the ASME Boiler and Pressure Vessel Code *as listed in rule 1301:7-7-45 of the Administrative Code*, as applicable. Containers used for the storage of liquefied hydrogen shall be provided with pressure relief devices in accordance with *paragraph* (C)(2)(3203.2) *of rule 1301:7-7-32 of the Administrative Code*.

(*a*) **2209.5.4.2.1 Minimum rate of discharge.** The minimum flow capacity of pressure relief devices on hydrogen storage containers shall be at least the capacity required by *paragraph* (I)(5)(d)(ii)(2209.5.4.2) *of this rule* or the capacity required to accommodate a hydrogen compressor that fails to shut down or unload, whichever is greater.

~~(i)~~ (iii) **~~2209.5.4.1~~ 2209.5.4.3 Vent pipe.** ~~A vent pipe that will divert the gas flow to atmosphere shall be installed on the vessel for purging operations The vent pipe shall be designed and constructed as follows:~~ Stationary containers and tanks shall be provided with a vent pipe system that will divert gas discharged from the pressure relief devices to the atmosphere. Vent pipe systems serving pressure relief devices and purging systems used for operational control shall be designed and constructed in accordance with *paragraphs* (I)(5)(d)(iii)(*a*)(2209.5.4.3.1) *to* (I)(5)(d)(iii)(*f*)(2209.5.4.3.6) *of this rule*.

~~*(a)* The piping shall be constructed of pipe or tubing materials approved for hydrogen service in accordance with ANSI B31.3 *as listed in rule 1301:7-7-45 of the Administrative Code* for the rated pressure, volume and temperature. The vent piping shall be designed for the maximum back pressure within the pipe, but not less than 335 pounds per square inch gauge (psig) (2310 kPa).~~

~~(*b*) The vent pipe shall be properly supported and shall be provided with a rain cap or other feature which would not limit or obstruct the gas flow from venting vertically upward.~~

~~(*c*) A means shall be provided to prevent water, ice and other debris from accumulating inside the vent pipe or obstructing the vent pipe.~~

~~(*d*) At the connection fitting of the vent pipe and hydrogen cylinder, a listed bi-directional detonation flame arrester shall be provided.~~

(*a*) **2209.5.4.3.1 Materials of construction.** The vent pipe system shall be constructed of materials approved hydrogen service in accordance with ASME B31.3 *as listed in rule 1301:7-7-45 of the Administrative Code* for the rated pressure, volume and temperature of gas to be transported. The vent piping shall be designed for the maximum backpressure within the pipe, but not less than 335 pounds per square inch gauge (psig) (2310 kPa).

(*b*) **2209.5.4.3.2 Structural support.** The vent pipe system shall be supported to prevent structural collapse and shall be provided with a rain cap or other feature that would not limit or obstruct the gas flow from venting vertically upward.

(*c*) **2209.5.4.3.3 Obstructions.** A means shall be provided to prevent water, ice and other debris from accumulating inside the vent pipe or obstructing the vent pipe.

(*d*) **2209.5.4.3.4 Height of vent and separation.** The height (H) and separation distance (D) of the vent pipe shall meet the criteria set forth in Table 2209.5.4.3.4 *of this rule* for the combinations of maximum hydrogen flow rates and vent stack opening diameters listed. Alternative venting systems shall be allowed when in accordance with *paragraph* (I)(5)(d)(iii)(f)(2209.5.4.3.6) *of this rule*.

Table ~~2209.5.4.2~~ 2209.5.4.3.4

Vent pipe height and separation distance versus hydrogen flow rate and vent pipe diameter[a,b,c,d,e,f]

~~Hydrogen flow rate~~	~~0-500 CFM at NTP~~		~~500-1000 CFM at NTP~~		~~1,000-2,000 CFM at NTP~~		~~2,000-5,000 CFM at NTP~~			~~5,000-10,000 CFM at NTP~~			~~10,000-20,000 CFM at NTP~~	
~~Vent diameter (inches)~~	~~1~~	~~2~~	~~1~~	~~2~~	~~1~~	~~2~~	~~1~~	~~2~~	~~3~~	~~1~~	~~2~~	~~3~~	~~2~~	~~3~~
~~Height (ft)~~	~~8~~	~~8~~	~~8~~	~~8~~	~~12~~	~~12~~	~~17~~	~~12~~	~~13~~	~~25~~	~~25~~	~~22~~	~~36~~	~~36~~
~~Distance (ft)~~	~~13~~	~~13~~	~~15~~	~~17~~	~~22~~	~~26~~	~~39~~	~~36~~	~~40~~	~~53~~	~~53~~	~~53~~	~~81~~	~~81~~

Hydrogen flow rate	≤500 CFM at NTP[g]	>500 to ≤1,000 CFM at NTP[g]	>1,000 to ≤2,000 CFM at NTP[g]	>2,000 to ≤5,000 CFM at NTP[h]	>5,000 to ≤10,000 CFM at NTP[h]	>10,000 to ≤20,000 CFM at NTP[h]
Height (ft)	8	8	12	17	25	36
Distance (ft)	13	17	26	40	53	81

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 Btuh/ft_2 = 3.153 W/m^2, 1 foot/second = 304.8 mm/sec.

a. Minimum distance to ~~lot~~ property line is ~~1.25 times the separation distance~~ 1.25D.

b. Designs seeking to achieve greater heights with commensurate reductions in separation distances shall be designed in accordance with accepted engineering practice.

c. With this table, personnel on the ground or on the building/equipment are exposed to a maximum of 1,500 Btuh/$ft.^2$, and are assumed to be provided with a means to escape to a shielded area within 3 minutes, including the case of a 30 ft./sec. wind.

d. Designs seeking to achieve greater radiant exposures to noncombustible equipment shall be designed in accordance with accepted engineering practice.

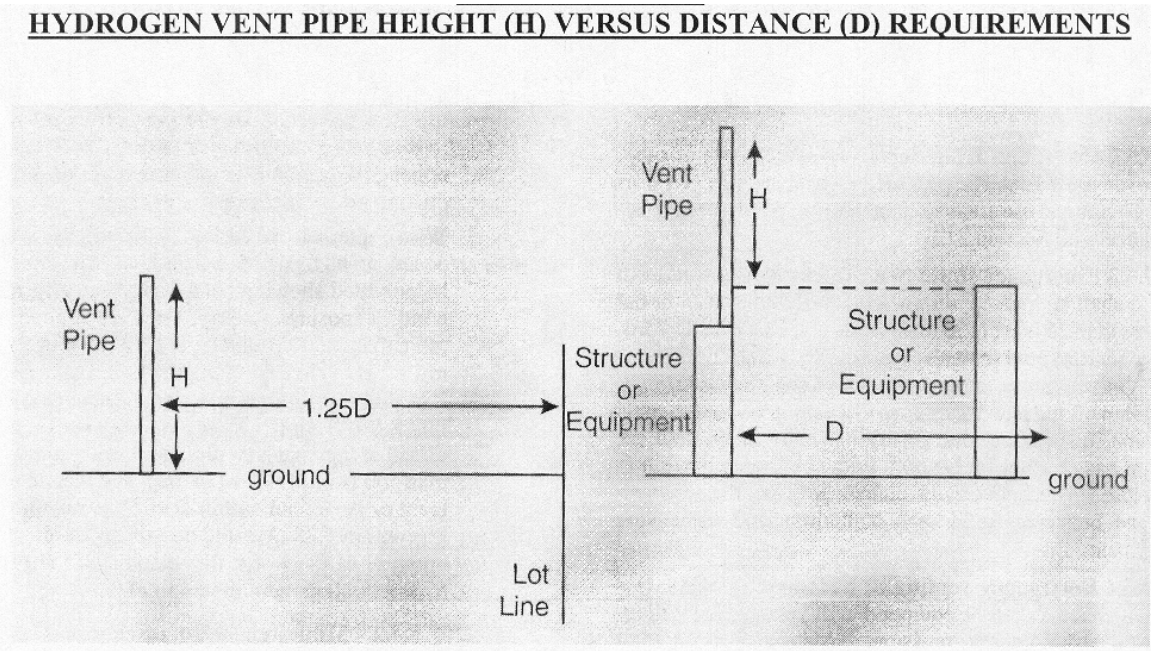
e. The analysis reflected in this table does not permit hydrogen air mixtures that would exceed one-half of the lower flammable limit (LFL) for hydrogen (2 per cent by volume) at the building or equipment, including the case of a 30 ft./sec. wind.

f. See Figure ~~2209.5.4.2~~ 2209.5.4.3.4 *of this rule*.

g. For vent pipe diameters up to and including 2 inches.

h. For vent pipe diameters up to and including 3 inches.

Figure ~~2209.5.4.2~~ 2209.5.4.3.4
Hydrogen vent pipe height (H) versus distance (D) requirements



H = Minimum height in feet of vent pipe above the ground or above any structure or equipment within distance (D) where personnel might be present.

D = Distance in feet to adjacent structure or equipment where personnel might be present.

(*e*) **2209.5.4.3.5 Maximum flow rate.** The vent pipe system shall be sized based on the maximum flow rate for the system served and be specified on the construction documents. The maximum flow rate shall be determined in accordance with the requirements of CGA S-1.3 *as listed in rule 1301:7-7-45 of the Administrative Code* using the aggregate gas flow rate from all connected vent, purge and relief devices that operate simultaneously during a venting operation, purging operation or emergency relief event.

(*f*) **2209.5.4.3.6 Alternative venting systems.** Where alternative venting systems are used in lieu of the requirements of *paragraph* (I)(5)(d)(iii)(e)(2209.5.4.3.5) *of this rule*, an analysis of radiant heat exposures and hydrogen concentrations shall be provided. The analysis of exposure to radiant heat shall assume a wind speed of 30 feet/second (9.14 m/sec) and provide a design that limits radiant heat exposure to the maximum valves shown in Table 2209.5.4.3.6(1) *of this rule*. The analysis of exposure to hydrogen concentration shall provide a design that limits the maximum hydrogen concentration to the values shown in Table 2209.5.4.3.6(2) *of this rule*.

Table 2209.5.4.3.6(1)
Maximum radiant heat exposure

Exposed object	Maximum radiant heat	Time duration (minutes)
Personnel	1,500 Btu/hr . ft^2 (4732 W/m^2)	3
Noncombustible equipment	8,000 Btu/hr . ft^2 (25 237 W/m^2)	Any
Lot line	500 Btu/hr . ft^2 (1577 W/m^2)	Any

Table 2209.5.4.3.6(2)
Maximum hydrogen concentration exposure

Exposed object	Maximum hydrogen concentration
Personnel, buildings or equipment	50% LFL within a distance of D and H of Table 2209.5.4.3.4 *of this rule*
Lot line	50% LFL within 1.25 times the distance of D and H of Table 2209.5.4.3.4 *of this rule*

~~(ii) **2209.5.4.2 Venting of hydrogen gas.** Venting of hydrogen gas shall be as follows:~~

~~1. The height (H) and separation distance (D) of the vent pipe shall meet the criteria set forth in Table 2209.5.4.2 *of this rule* for the combinations of maximum hydrogen flow rates and vent stack opening diameters listed;~~

~~2. The maximum emergency purging flow rate shall be specified for verification by the authority having jurisdiction. The maximum emergency purging flow rate shall be the pressure relief device release rate in accordance with CGA S-1.3 *as listed in rule 1301:7-7-45 of the Administrative Code* for a nonengulfing flame or the maximum on-site production rate, whichever is larger; or~~

~~3. Where alternative venting arrangements are proposed, an analysis of radiant heat exposures shall be provided showing [in a 30 ft./sec (9.14 m/sec) wind]: exposures to employees are limited to no more than 1,500 Btuh/ft^2 (4732 W/m^2) for a maximum of three minutes, exposures to noncombustible equipment are limited to no more than 500 Btuh/ft^2 (1577 W/m^2); and that no equipment or personnel within D or H, or any property line within 1.25 D would be exposed to more than one-half of the lower flammable limit (LFL) for hydrogen (2 per cent by volume).~~

~~(*a*) **2209.5.4.2.1 Minimum rate of discharge.** The minimum rate of discharge of pressure relief devices on the hydrogen storage tanks shall be in accordance with CGA S-1.3 *as listed in rule 1301:7-7-45 of the Administrative* Code; except for the provision in *paragraph* (I)(5)(d)(iii)(2009.5.4.3) *of this rule*, or the ASME~~

~~Boiler and Pressure Vessel Code *as listed in rule 1301:7-7-45 of the Administrative Code*, as applicable.~~

~~(iii) **2209.5.4.3Vent pipe flow rates.** Where above ground storage of flammable or combustible liquids occurs and the tanks are diked, or no above ground storage of flammable or combustible liquids exists, the sizing of the maximum flow for the vent pipe need not include the vent flow as a result of an "engulfing fire" of the hydrogen storage tanks. The pressure relief valve(s) on the gaseous hydrogen storage tanks shall be sized to accommodate a hydrogen compressor that fails to shutdown or unload as a minimum.~~

(J) **Section 2210 Marine motor fuel-dispensing facilities**

(1) **2210.1 General.** The construction of marine motor fuel-dispensing facilities shall be in accordance with the *building code* and NFPA 30A *as listed in rule 1301:7-7-45 of the Administrative Code*. The storage of Class I, II or IIIA liquids at marine motor fuel-dispensing facilities shall be in accordance with *this rule and rule 1301:7-7-34 of the Administrative Code. Where underground storage of flammable or combustible liquids is impractical due to geological conditions of the site, shore tanks supplying marine service stations may be located aboveground in special enclosures, vaults or protected aboveground tanks which provide physical protection and fire-resistive protection as a unit, when approved by the fire code official. The request to install such aboveground tanks shall be accompanied by a site survey which supports the request. The survey shall be prepared by a registered professional engineer of the appropriate discipline.*

(2) **2210.2 Storage and handling.** The storage and handling of Class I, II or IIIA liquids at marine motor fuel-dispensing facilities shall be in accordance with *paragraphs* (J)(2)(a)(2210.2.1) *to* (J)(2)(c)(2210.2.3) *of this rule*.

(a) **2210.2.1 Class I, II or IIIA liquid storage.** Class I, II or IIIA liquids stored inside of buildings used for marine motor fuel-dispensing facilities shall be stored in approved containers or portable tanks. Storage of Class I liquids shall not exceed 10 gallons (38 L).

Exception: Storage in liquid storage rooms in accordance with *paragraph* (D)(3)(g)(3404.3.7) *of rule 1301:7-7-34 of the Administrative Code*.

(b) **2210.2.2 Class II or IIIA liquid storage and dispensing.** Class II or IIIA liquids stored or dispensed inside of buildings used for marine motor fuel-dispensing facilities shall be stored in and dispensed from approved containers or portable tanks. Storage of Class II and IIIA liquids shall not exceed 120 gallons (454 L).

(c) **2210.2.3 Heating equipment.** Heating equipment installed in Class I, II or IIIA liquid storage or dispensing areas shall comply with *paragraph* (A)(6)(2201.6) *of this rule*.

(3) **2210.3 Dispensing.** The dispensing of liquid fuels at marine motor fuel-dispensing facilities shall comply with *paragraphs* (J)(3)(a)(2210.3.1) *to* (J)(3)(e)(2210.3.5) *of this rule*.

(a) **2210.3.1 General.** Wharves, piers or floats at marine motor fuel-dispensing facilities shall be used exclusively for the dispensing or transfer of petroleum products to or from marine craft, except that transfer of essential ship stores is allowed.

(b) **2210.3.2 Supervision.** Marine motor fuel-dispensing facilities shall have an attendant or supervisor who is fully aware of the operation, mechanics and hazards inherent to fueling of boats on duty whenever the facility is open for business. The attendant's primary function shall be to supervise, observe and control the dispensing of Class I, II or IIIA liquids or flammable gases.

(c) **2210.3.3 Hoses and nozzles.** Dispensing of Class I, II or IIIA liquids into the fuel tanks of marine craft shall be by means of an approved hose equipped with a listed automatic-closing nozzle without a latch-open device.

Hoses used for dispensing or transferring Class I, II or IIIA liquids, when not in use, shall be reeled, racked or otherwise protected from mechanical damage.

(d) **2210.3.4 Portable containers.** Class I, II or IIIA liquids shall not be dispensed into a portable container unless such container is approved.

(e) **2210.3.5 Liquefied petroleum gas.** Liquefied petroleum gas cylinders shall not be filled at marine motor fuel-dispensing facilities unless approved. Storage facilities for LP-gas cylinders shall be provided *in accordance with paragraph* (G)(2207) *of this rule*.

(4) **2210.4 Fueling of marine vehicles at other than approved marine motor fuel-dispensing facilities.** Fueling of floating marine craft with Class I fuels at other than a marine motor fuel-dispensing facility is prohibited. Fueling of floating marine craft with Class II or III fuels at other than a marine motor fuel-dispensing facility shall be in accordance with all of the following:

(a) The premises and operations shall be approved by the fire code official.

(b) Tank vehicles and fueling operations shall comply with *paragraph* (F)(6)(3406.6) *of rule 1301:7-7-34 of the Administrative Code*.

(c) The dispensing nozzle shall be of the listed automatic-closing type without a latch-open device.

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

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

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

(5) **2210.5 Fire prevention regulations.** General fire safety regulations for marine motor fuel-dispensing facilities shall comply with *paragraphs* (J)(5)(a)(2210.5.1) *to* (J)(5)(g)(2210.5.7) *of this rule*.

(a) **2210.5.1 Housekeeping.** Marine motor fuel-dispensing facilities shall be maintained in a neat and orderly manner. Accumulations of rubbish or waste in excessive amounts shall be prohibited.

(b) **2210.5.2 Spills.** Spills of Class I, II or IIIA liquids at or on the water shall be reported immediately to the fire department and jurisdictional authorities.

(c) **2210.5.3 Rubbish containers.** Metal containers with tight-fitting or self-closing metal lids shall be provided for the temporary storage of combustible trash or rubbish.

(d) **2210.5.4 Marine vessels and craft.** Vessels or craft shall not be made fast to fuel docks serving other vessels or craft occupying a berth at a marine motor fuel-dispensing facility.

(e) **2210.5.5 Sources of ignition.** Construction, maintenance, repair and reconditioning work involving the use of open flames, arcs or spark-producing devices shall not be performed at marine motor fuel-dispensing facilities or within 50 feet (15 240 mm) of the dispensing facilities, including piers, wharves or floats, except for emergency repair work approved in writing by the fire code official. Fueling shall not be conducted at the pier, wharf or float during the course of such emergency repairs.

(i) **2210.5.5.1 Smoking.** Smoking or open flames shall be prohibited within 50 feet (15 240 mm) of fueling operations. "No Smoking" signs complying with *paragraph* (J)(310) *of rule 1301:7-7-03 of the Administrative Code* shall be posted conspicuously about the premises. Such signs shall have letters not less than 4 inches (102 mm) in height on a background of contrasting color.

(f) **2210.5.6 Preparation of tanks for fueling.** Boat owners and operators shall not offer their craft for fueling unless the tanks being filled are properly vented to dissipate fumes to the outside atmosphere.

(g) **2210.5.7 Warning signs.** Warning signs shall be predominately displayed at the face of each wharf, pier or float at such elevation as to be clearly visible from the decks of marine craft being fueled. Such signs shall have letters not less than 3

inches (76 mm) in height on a background of contrasting color bearing the following or approved equivalent wording:

WARNING
NO SMOKING-STOP ENGINE WHILE FUELING,
SHUT OFF ELECTRICITY.

DO NOT START ENGINE UNTIL AFTER BELOW
DECK SPACES ARE VENTILATED.

(6) **2210.6 Fire protection.** Fire protection features for marine motor fuel-dispensing facilities shall comply with *paragraphs* (J)(6)(a)(2210.6.1) *to* (J)(6)(d)(2210.6.4) *of this rule*.

(a) **2210.6.1 Standpipe hose stations.** Fire hose, where provided, shall be enclosed within a cabinet, and hose stations shall be labeled: FIRE HOSE – EMERGENCY USE ONLY.

(b) **2210.6.2 Obstruction of fire protection equipment.** Materials shall not be placed on a pier in such a manner as to obstruct access to fire-fighting equipment or piping system control valves.

(c) **2210.6.3 Access.** 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 apparatus.

(d) **2210.6.4 Portable fire extinguishers.** Portable fire extinguishers in accordance with *paragraph* (F)(906) *of rule 1301:7-7-09 of the Administrative Code*, each having a minimum rating of 20-B:C, shall be provided as follows:

(i) One on each float.

(ii) One on the pier or wharf within 25 feet (7620 mm) of the head of the gangway to the float, unless the office is within 25 feet (7620 mm) of the gangway or is on the float and an extinguisher is provided thereon.

(K) **Section 2211 Repair garages**

(1) **2211.1 General.** Repair garages shall comply with this *paragraph* and the *building code as listed in rule 1301:7-7-45 of the Administrative Code*. Repair garages for vehicles that use more than one type of fuel shall comply with the applicable provisions of this *paragraph* for each type of fuel used.

Where a repair garage also includes a motor fuel-dispensing facility, the fuel-dispensing operation shall comply with the requirements of this *rule* for motor fuel-dispensing facilities.

(2) **2211.2 Storage and use of flammable and combustible liquids.** The storage and use of flammable and combustible liquids in repair garages shall comply with *rule 1301:7-7-34 of the Administrative Code* and *paragraphs* (K)(2)(a)(2211.2.1) *to* (K)(2)(d)(2211.2.4) *of this rule*.

(a) **2211.2.1 Cleaning of parts.** Cleaning of parts shall be conducted in approved parts cleaning machines in accordance with *rule 1301:7-7-34 of the Administrative Code*.

(b) **2211.2.2 Waste oil, motor oil and other Class IIIB liquids.** Waste oil, motor oil and other Class IIIB liquids shall be stored in tanks or containers *approved in accordance with rule 1301:7-7-34 of the Administrative Code*, which are allowed to be stored and dispensed from inside repair garages.

(i) **2211.2.2.1 Tank location.** Tanks storing Class IIIB liquids in repair garages are allowed to be located at, below or above grade, provided that adequate drainage or containment is provided.

(ii) **2211.2.2.2 Liquid classification.** Crankcase drainings shall be classified as Class IIIB liquids unless otherwise determined by testing.

(c) **2211.2.3 Drainage and disposal of liquids and oil-soaked waste.** Garage floor drains, where provided, shall drain to oil separators or traps discharging to a sewer in accordance with the *plumbing code as listed in rule 1301:7-7-45 of the Administrative Code*. Contents of oil separators, traps and floor drainage systems shall be collected at sufficiently frequent intervals and removed from the premises to prevent oil from being carried into the sewers.

(i) **2211.2.3.1 Disposal of liquids.** Crankcase drainings and liquids shall not be dumped into sewers, streams or on the ground, but shall be stored in tanks or containers in accordance with *rule 1301:7-7-34 of the Administrative Code* until removed from the premises.

(ii) **2211.2.3.2 Disposal of oily waste.** Self-closing metal cans shall be used for oily waste.

(d) **2211.2.4 Spray finishing.** Spray finishing with flammable or combustible liquids shall comply with *rule 1301:7-7-15 of the Administrative Code*.

(3) **2211.3 Sources of ignition.** Sources of ignition shall not be located within 18 inches (457 mm) of the floor and shall comply with *rules 1301:7-7-03 and 1301:7-7-26 of the Administrative Code*.

(a) **2211.3.1 Equipment.** Appliances and equipment installed in a repair garage shall comply with the provisions of the *building code*, the *mechanical code* and *NFPA 70 as listed in rule 1301:7-7-45 of the Administrative Code*.

(b) **2211.3.2 Smoking.** Smoking shall not be ~~permitted~~ allowed in repair garages except in approved locations ~~complying with *paragraph* (J)(310) *of rule 1301:7-7-03 of the Administrative Code*~~.

(4) **2211.4 Below-grade areas.** Pits and below grade work areas in repair garages shall comply with *paragraphs* (K)(4)(a)(2211.4.1) *to* (K)(4)(c)(2211.4.3) *of this rule*.

(a) **2211.4.1 Construction.** Pits and below-grade work areas shall be constructed in accordance with the *building code as listed in rule 1301:7-7-45 of the Administrative Code*.

(b) **2211.4.2 Means of egress.** Pits and below-grade work areas shall be provided with means of egress in accordance *with rule 1301:7-7-10 of the Administrative Code*.

(c) **2211.4.3 Ventilation.** Where Class I liquids or LP-gas are stored or used within a building having a basement or pit wherein flammable vapors could accumulate, the basement or pit shall be provided with mechanical ventilation in accordance with the *mechanical code as listed in rule 1301:7-7-45 of the Administrative Code,* at a minimum rate of 1.5 cubic feet per minute per square foot (cfm/ft^2) [0.008 m^3/(s·m^2)] to prevent the accumulation of flammable vapors.

(5) **2211.5 Preparation of vehicles for repair.** For vehicles powered by gaseous fuels, the fuel shutoff valves shall be closed prior to repairing any portion of the vehicle fuel system.

Vehicles powered by gaseous fuels in which the fuel system has been damaged shall be inspected and evaluated for fuel system integrity prior to being brought into the repair garage. The inspection shall include testing of the entire fuel delivery system for leakage.

(6) **2211.6 Fire extinguishers.** Fire extinguishers shall be provided in accordance with *paragraph* (F)(906) *of rule 1301:7-7-09 of the Administrative Code*.

(7) **2211.7 Repair garages for vehicles fueled by lighter-than-air fuels.** Repair garages for the conversion and repair of vehicles which use CNG, liquefied natural gas (LNG), hydrogen or other lighter-than-air motor fuels shall be in accordance with ~~*paragraph*~~ *paragraphs* (K)(7)(2211.7) *to* (K)(7)(b)(iii)(2211.7.2.3) *of this rule* in addition to the other requirements of *paragraph* (K)(2211) *of this rule*.

Exception: Repair garages where work is not performed on the fuel system and is limited to exchange of parts and maintenance requiring no open flame or welding.

(a) **2211.7.1 Ventilation.** Repair garages used for the repair of natural gas- or hydrogen fueled vehicles shall be provided with *a* mechanical ventilation system. The mechanical ventilation system shall be in accordance with the *mechanical code as listed in rule 1301:7-7-45 of the Administrative Code* and *paragraphs* (K)(7)(a)(i)(2211.7.1.1) and (K)(7)(a)(ii)(2211.7.1.2) *of this rule*.

Exception: Repair garages with natural ventilation when approved.

(i) **2211.7.1.1 Design.** Indoor locations shall be ventilated utilizing air supply inlets and exhaust outlets arranged to provide uniform air movement to the extent practical. Inlets shall be uniformly arranged on exterior walls near floor level. Outlets shall be located at the high point of the room in exterior walls or the roof.

Ventilation shall be by a continuous mechanical ventilation system or by a mechanical ventilation system activated by a continuously monitoring natural gas detection system ~~where~~ or, for hydrogen, a continuously monitoring flammable gas detection system, each activating at a gas concentration of not more than 25 per cent of the lower flammable limit (LFL) ~~is present~~. In ~~either case~~ all cases, the system shall shut down the fueling system in the event of failure of the ventilation system.

The ventilation rate shall be at least 1 cubic foot per minute per 12 cubic feet (0.00139 $m^3/s \cdot m^3$) of room volume.

(ii) **2211.7.1.2 Operation.** The mechanical ventilation system shall operate continuously.

Exceptions:

1. Mechanical ventilation systems that are interlocked with a gas detection system designed in accordance with ~~*paragraph*~~ *paragraphs* (K)(7)(b)(2211.7.2) *to* (K)(7)(b)(iii)(2211.7.2.3) *of this rule*.

2. Mechanical ventilation systems in repair garages that are used only for repair of vehicles fueled by liquid fuels or odorized gases, such as CNG, where the ventilation system is electrically interlocked with the lighting circuit.

(b) **2211.7.2 Gas detection system.** Repair garages used for repair of vehicles fueled by nonodorized gases, such as hydrogen and nonodorized LNG, shall be provided with an approved flammable gas detection system.

(i) **2211.7.2.1 System design.** The flammable gas detection system shall be calibrated to the types of fuels or gases used by vehicles to be repaired. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 per cent of the lower flammable limit (LFL). Gas detection shall also be provided in lubrication or chassis repair pits of repair garages used for repairing nonodorized LNG-fueled vehicles.

(ii) **2211.7.2.2 Operation.** Activation of the gas detection system shall result in all of the following:

(a) Initiation of distinct audible and visual alarm signals in the repair garage.

(b) Deactivation of all heating systems located in the repair garage.

(c) Activation of the mechanical ventilation system, when the system is interlocked with gas detection.

(iii) **2211.7.2.3 Failure of the gas detection system.** Failure of the gas detection system shall result in the deactivation of the heating system, activation of the mechanical ventilation system and where the system is interlocked with gas detection and causes a trouble signal to sound in an *occupied area or other location approved by the fire code official*.

(8) **2211.8 Defueling of hydrogen from motor vehicle fuel storage containers.** The discharge or defueling of hydrogen from motor vehicle fuel storage tanks for the purpose of maintenance, cylinder certification, calibration of dispensers or other activities shall be in accordance with ~~*paragraph*~~ *paragraphs* (K)(8)(a)(2211.8.1) *to* (K)(8)(a)(ii)(*d*)(2211.8.1.2.4) *of this rule*.

(a) **2211.8.1 Methods of discharge.** The discharge of hydrogen from motor vehicle fuel storage tanks shall be accomplished through a closed transfer system in accordance with *paragraph* (K)(8)(a)(i)(2211.8.1.1) *of this rule* or *a* method of atmospheric venting in accordance with *paragraph* (K)(8)(a)(ii)(2211.8.1.2) *of this rule*.

(i) **2211.8.1.1 Closed transfer system.** A documented procedure that explains the sequence for discharging the storage tank shall be provided to the code official for review and approval. The procedure shall include what actions the operator is required to take in the event of a low-pressure or high pressure hydrogen release during discharging activity. Design documents shall be

provided illustrating the arrangement of piping, regulators and equipment settings. The construction documents shall illustrate the piping and regulator arrangement and shall be shown in spatial relation to the location of the compressor, storage vessels and emergency shutdown devices.

(ii) **2211.8.1.2 Atmospheric venting of hydrogen from motor vehicle fuel storage containers.** When atmospheric venting is used for the discharge of hydrogen from motor vehicle fuel storage tanks such venting shall be in accordance with *paragraphs* (K)(8)(a)(ii)(*a*)(2211.8.1.2.1) *to* (K)(8)(a)(ii)(*d*)(2211.8.1.2.4) *of this rule*.

(*a*) **2211.8.1.2.1 Defueling equipment required at vehicle maintenance and repair facilities.** All facilities for repairing hydrogen systems on hydrogen fueled vehicles shall have equipment to defuel vehicle storage tank(s). Equipment used for defueling shall be listed and labeled for the intended use.

(i) **2211.8.1.2.1.1 Manufacturer's equipment required.** Equipment supplied by the vehicle manufacturer shall be used to connect the vehicle storage tanks to be defueled to the vent pipe system.

(ii) **2211.8.1.2.1.2 Vent pipe maximum diameter.** Defueling vent pipes shall have a maximum inside diameter of 1 inch (25 mm) and be installed in accordance with *paragraph* (I)(5)(d)(2209.5.4) *of this rule*.

(iii) **2211.8.1.2.1.3 Maximum flow rate.** The maximum rate of hydrogen flow through the vent pipe system shall not exceed 1,000 cfm (2.5 kg/min) and shall be controlled by means of the manufacturer's equipment, at low pressure and without adjustment.

(iv) **2211.8.1.2.1.4 Isolated use.** The vent pipe used for defueling shall not be connected to another venting system used for any other purpose.

(*b*) **2211.8.1.2.2 Construction documents.** Construction documents shall be provided illustrating the defueling system to be utilized. Plan details shall be of sufficient detail and clarity to allow for evaluation of the piping and control systems to be utilized and include the method of

support for cylinders, containers or tanks to be used as part of a closed transfer system, the method of grounding and bonding, and other requirements specified herein.

(*c*) **2211.8.1.2.3 Stability of cylinders, containers and tanks.** A method of rigidly supporting cylinders, containers or tanks used during the closed transfer system discharge or defueling of hydrogen shall be provided. The method shall provide not less than two points of support and shall be designed to resist lateral movement of the receiving cylinder, container or tank. The system shall be designed to resist movement of the receiver based on the highest gas-release velocity through valve orifices at the receiver's rated service pressure and volume. Supporting structure or appurtenance used to support receivers shall be constructed of noncombustible materials in accordance with the *building code as listed in rule 1301:7-7-45 of the Administrative Code*.

(*d*) **2211.8.1.2.4 Grounding and bonding.** Cylinders, containers or tanks and piping systems used for defueling shall be bonded and grounded. Structures or appurtenances used for supporting the cylinders, containers or tanks shall be grounded in accordance with *NFPA 70 and the building code as listed in rule 1301:7-7-45 of the Administrative Code.* The valve of the vehicle storage tank shall be bonded with the defueling system prior to the commencement of discharge or defueling operations.

(b) **2211.8.2 Repair of hydrogen piping.** Piping systems containing hydrogen shall not be opened to the atmosphere for repair without first purging the piping with an inert gas to achieve 1 per cent hydrogen or less by volume. Defueling operations and exiting purge flow shall be vented in accordance with *paragraph* (K)(8)(a)(ii)(2211.8.1.2) *of this rule*.

(c) **2211.8.3 Purging.** Each individual manufactured component of a hydrogen generating, compression, storage, or dispensing system shall have a label affixed as well as a description in the installation and owners manuals describing the procedure for purging air from the system during startup, regular maintenance and for purging hydrogen from the system prior to disassembly (to admit air).

For the interconnecting piping between the individual manufactured components the pressure rating must be at least 20 times the absolute pressure present in the piping when any hydrogen meets any air.

(i) **2211.8.3.1 System purge required.** After installation, repair or maintenance, the hydrogen piping system shall be purged of air in accordance with the manufacturer's procedure for purging air from the system.

(L) ***Section 2212 Service station at a bulk plant or terminal***

(1) ***2212.1 General.*** *That portion of a bulk plant property where flammable or combustible liquids are stored and dispensed from fixed equipment into the fuel tanks of motor vehicles, marine craft or approved containers shall comply with this paragraph and NFPA 30A as listed in rule 1301:7-7-45 of the Administrative Code.*

Exception: *The dispensing of diesel fuel at a terminal or bulk plant into a motor vehicle that is transporting petroleum products or equipment essential to the operation of the terminal or bulk plant, provided that the motor vehicle is owned or leased by or operated under a contract with a person who has been issued a motor fuel dealers license under section 5735.02 of the Revised Code. For such dispensing, the provisions of this rule governing capacity limitations shall not apply.*

(2) ***2212.2 Separation.*** *All equipment utilized in connection with the storage and dispensing operations of a motor fuel-dispensing facility shall be separated by a minimum of ~~50~~ 100 feet from the area in which aboveground bulk plant operations are conducted and by a security fence. Any gates in the required fence shall be secured against unauthorized entry.*

(3) ***2212.3 Independent operations.*** *Motor fuel-dispensing facility operations shall be totally independent of the bulk plant operations to include:*

(a) *Above-ground tanks located in the bulk plant shall not supply dispensing devices at the motor fuel-dispensing facility.*

(b) *Storage tanks at the motor fuel-dispensing facility shall not be connected by piping to aboveground tanks located in the bulk plant.*

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