

DEPARTMENT OF STATE POLICE

STATE FIRE SAFETY BOARD

COMPRESSED NATURAL GAS (CNG) VEHICULAR FUEL SYSTEMS

(By authority conferred on the state fire safety board by section 3c of Act No. 207 of the Public Acts of 1941, as amended, being §29.3c of the Michigan Compiled Laws)

PART 1. GENERAL PROVISIONS

R 29.4601 Applicability.

Rule 1. These rules apply to the design and installation of CNG engine fuel systems on vehicles and associated fuel-dispensing systems. A person shall comply with these rules and with other applicable state and federal statutes and rules and regulations promulgated under the statutes.

History: 1995 AACS.

R 29.4602 Compressed natural gas (CNG) vehicular fuel systems; adoption of standard by reference.
Rule 2. The national fire protection association pamphlet no. 52, 1992 edition, entitled "Standard for Compressed Natural Gas (CNG) Vehicular Fuel Systems," referred to in these rules as "the standard," is adopted by reference as part of these rules. Copies of the adopted standard are available for inspection and distribution either at the office of the State Fire Safety Board, Michigan Department of State Police Fire Marshal Division, General Services Unit, 7150 Harris Drive, Lansing, Michigan 48913, or from the National Fire Protection Association, One Batterymarch Park, Quincy, Massachusetts 02269, telephone number 1-800-344-3555. The cost as of the time of adoption of these rules is \$19.50 per copy.

History: 1995 AACS.

PART 2. AMENDMENTS TO THE STANDARD FOR
COMPRESSED NATURAL GAS (CNG) VEHICULAR FUEL SYSTEMS

R 29.4621 Scope.

Rule 21. Section 1-1 of the standard is amended to read as follows:

1-1. The standard applies to the design and installation of compressed natural gas (CNG) engine fuel systems on vehicles of all types, including aftermarket and OEM's, and to all fuel-dispensing stations. Exception: Vehicles which are in compliance with federal motor vehicle safety standards covering the installation of CNG fuel systems on vehicles and which are certified by the vehicle manufacturer as meeting these standards do not need to be in compliance with section 2-8.4 of the standard and chapter 3, engine fuel systems, except for section 3-11 of the standard, labeling.

History: 1995 AACS.

R 29.4622 Alternate provisions.

Rule 22. Section 1-2 of the standard is amended to read as follows:

1-2. It is recognized that advancement in technology and improvements in system design and equipment may result in equipment operating practices that differ from those specifically called for in the standard. Such deviations or improvements may provide desirable safety and compatible operation meeting the intent of the standard. A person may request a variation to the application of a rule by applying to the state fire marshal and including a satisfactory explanation of why compliance is not possible or why alternative technology provides an equivalent level of fire safety. The state fire marshal may make a variation upon finding that the variation does not result in an increased hazard to

life, property, or the environment. The state fire marshal shall transmit the findings to the person who requested the variation within 45 days of receipt of the variation request by the state fire marshal and shall enter the findings into the records of the state fire marshal.

History: 1995 AACS.

R 29.4623 Definitions.

Rule 23. Section 1-5 of the standard is amended by amending the definitions of "approved," "authority having jurisdiction," "bulk storage," "cascade storage system," "dispensing station," "fuel supply container," "labeled," "listed," "pressure relief device:" by adding the definitions of "natural gas vehicle (NGV) or vehicle," "original equipment manufacturer (OEM)," "rack," "state fire marshal," "system or system components," "vehicle fueling appliance;" and by deleting the definitions of "shall" and "should" to read as follows:

"Approved" means acceptable to the state fire marshal unless specifically indicated otherwise in the rules.

"Authority having jurisdiction" means the fire marshal division of the department of state police or a local unit of government delegated authority under Act No. 207 of the Public Acts of 1941, as amended, being §29.1 et seq. of the Michigan Compiled Laws.

"Bulk storage" means a single container or containers manifolded together, where all containers draw down at the same rate.

"Cascade storage system" means storage in containers arranged in banks where each bank acts as 1 large container. The banks are separated by switching valves to provide sequential drawdown of the banks. The banks may consist of 1 or more containers.

"Dispensing station" means a natural gas installation that dispenses CNG either from a storage container or containers or from a distribution pipeline by means of a compressor or pressure booster into fuel supply containers on a vehicle or into portable cylinders. "Fuel supply container" means a container which is or may be mounted upon a vehicle to store CNG as the fuel supply to the internal combustion engine of the vehicle.

"Labeled" means equipment or materials that have an attached label, symbol, or other identifying mark of an organization which is acceptable to the state fire marshal, which is concerned with product evaluation, and which maintains periodic inspection of the production of labeled equipment or materials. The label, symbol, or mark of the organization indicates that the manufacturer is in compliance with appropriate standards or performance in a specified manner.

"Listed" means equipment or materials included in a list published by an organization which is acceptable to the state fire marshal, which is concerned with product evaluation, and which maintains periodic inspection of the production of listed equipment or materials, and the listing shall state either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

"Natural gas vehicle (NGV) or vehicle" means a self propelled device on land; in, on, or by which any person or property is or may be transported or drawn upon, except for a device exclusively moved by human power or used exclusively on stationary rails or tracks; and which has the capability to use natural gas as an engine fuel.

"Original equipment manufacturer (OEM)" means an original equipment motor vehicle manufacturer that certifies that the motor vehicle is in compliance with applicable federal motor vehicle safety standards.

"Pressure relief device" means a pressure or temperature-activated device used to prevent pressure from rising above a predetermined maximum and thereby prevent the rupture of a normally charged pressure vessel or a cylinder when subjected to a standard fire test as required by 49 C.F.R. §173.34(d),(1989), or §73.34(d) of the transport commission of Canada (TC) regulations. Pressure relief devices for United States department of transportation (DOT) or TC cylinders shall also include devices capable of protecting partially charged cylinders when subjected to the fire tests.

"Rack" means a mounting system used to secure the CNG fuel supply container or containers to a vehicle.

"Shall" deleted.

"Should" deleted.

"State fire marshal" means the Michigan department of state police, fire marshal division.

"System or system components" means natural gas containers, pressure boosters, compressors, and all attached valves, piping, and appurtenances.

"Vehicle-fueling appliance" means a self-contained listed assembly used for the compression and delivery of natural gas into vehicles including the associated equipment and piping of the appliance.

History: 1995 AACCS.

R 29.4624 Prohibitions.

Rule 24. Sections 1-6, 1-6.1, 1-6.2, 1-6.3, 1-6.4, and 1-6.5 are added to the standard to read as follows;
1-6. Prohibitions.

1-6.1. Any CNG-dispensing station or practice that is not in compliance with these rules shall be considered to be in violation of these rules.

1-6.2. Upon notification by the authority having jurisdiction, a person shall not deliver CNG into any dispensing station if the station is not in compliance with these rules. Such notification may include a verbal or written communication or an affixed written notification on the CNG system.

1-6.3. A person shall not tamper with, remove, or disregard written notification affixed to the CNG system.

1-6.4. An owner or operator shall not continue to use a CNG-dispensing station that is a fire hazard.

1-6.5. If construction of the storage system is not commenced within 1 year after the date of approval, an installation application shall be resubmitted in accordance with this section. Fees required under the act shall be submitted with the resubmitted application.

History: 1995 AACCS.

R 29.4625 Installation application.

Rule 25. Sections 1-7, 1-7.1, 1-7.2, 1-7.3, 1-7.4, 1-7.5, and 1-7.6 are added to the standard to read as follows:

1-7. Installation application.

1-7.1. An application shall be submitted by the owner to the state fire marshal before the installation of a dispensing station or an addition to an existing dispensing station, except for a dispensing station that does not have storage, which may include a residential fueling facility or a vehicle fueling appliance.

1-7.2. The installation application shall include all of the following information:

(a) A plot map showing all of the following:

(i) The location of all of the following:

(A) Buildings.

(B) Public roadways.

(C) Railroad mainlines.

(D) Public sidewalks.

(E) Power lines.

(ii) The proposed location of the dispensing station.

(iii) The location of property lines.

(iv) The locations of existing aboveground and underground tanks storing flammable or combustible liquids.

(v) The location of the point of transfer in relationship to all of the following:

(A) The container.

(B) Buildings.

(C) Public ways.

(D) Outdoor places of public assembly.

(E) Driveways.

(F) Main line railroad track center lines.

(G) The line of adjoining property that may be built upon.

(H) Above ground and underground tanks storing flammable or combustible liquids.

(b) The construction material, the dimensions and the capacity of each container.

- (c) The type of container venting and pressure relief.
- (d) The compressor size (psig and scfm) of each container.
- (e) Container appurtenances.
- (f) A piping diagram showing sizes, valves, pressure relief and fittings, and control devices.
- (g) The water vapor control device, mechanism, or procedure.

1-7.3. Upon acknowledged receipt of the plans, the state fire marshal shall issue a plan review report within 30 days. If the plan review report is not issued within 30 days, the installation may be constructed according to the submitted plans and shall be in compliance with these rules.

1-7.4. Upon completion of the installation, the authority having jurisdiction shall be notified not less than 7 calendar days before the installation is placed in service. The authority having jurisdiction shall inspect the installation following the receipt of notification and shall certify the installation if the requirements of these rules have been met. If the inspection is not made within 2 working days of the receipt of notification, excluding Saturdays, Sundays, and holidays, the owner may place the installation in service and a notarized affidavit shall be submitted by the owner to the authority having jurisdiction attesting to the fact that the installation is in compliance with the plans submitted and applicable rules.

1-7.5. Upon the owner's request, all plans and specifications that are submitted to the state fire marshal for review shall be returned after the authority having jurisdiction has certified the installation or within 30 working days after the notification to the authority having jurisdiction of the completion of the installation. Plans and specifications may be marked "Confidential -- Do Not Copy" at the time they are submitted.

1-7.6. The requirements in these sections do not relieve the owner of legal responsibility for complying with applicable local ordinances.

History: 1995 AACCS.

R 29.4626 Installation application fees and annual certification fees.

Rule 26. Sections 1-8, 1-8.1, and 1-8.2 are added to the standard to read as follows:

1-8. Installation application fees and annual certification fees.

1-8.1. Only an owner of a CNG-dispensing station for which an installation application is required to be submitted under section 1-7 of the standard shall be required to pay fees as specified in section 5 of Act No. 207 of the Public Acts of 1941, as amended, being §29.5 of the Michigan Compiled Laws.

1-8.2. For the purpose of assessing fees, each 18,500 scf storage capacity of CNG or increment thereof shall be considered a tank, as used in section 5 of Act No. 207, of the Public Acts of 1941, as amended, being §29.5 of the Michigan Compiled Laws.

History: 1995 AACCS.

R 29.4627 Personnel.

Rule 27. Sections 1-9 and 1-9.1 are added to the standard to read as follows:

1-9. Personnel.

1-9.1. In the interest of safety, all persons involved in handling compressed natural gas shall be trained in the proper handling and operating procedures and only those individuals so trained are permitted to install, operate, or service compressed natural gas systems and equipment.

Exception: This training is not required for a person transferring CNG at an attended self-serve facility.

History: 1995 AACCS.

R 29.4628 Gas quality.

Rule 28. Section 2-2 of the standard is amended, and sections 2-2.1, 2-2.1.1, 2-2.2 and 2-2.3 are added to the standard, to read as follows:

2-2. Gas quality in the container shall be in compliance with the following specifications:

H ₂ S and soluble sulfides partial pressure.....	0.05 psi. max.
Water vapor	7.0 lb./MMCF, max.
CO ₂ partial pressure.....	7 psi. max.
O ₂	0.5 volume %, max.

Exception: When the dew point of the gas entering the container is below the lowest anticipated container temperature at the maximum anticipated container pressure, the specifications of this section do not apply.

NOTE: For additional information on gas quality see Society of Automotive Engineers (SAE) standard J1616, entitled "Surface Vehicle Recommended Practice for Natural Gas Vehicle Fuel Composition." Natural Gas introduced into any system covered by the standard shall have a distinctive odor potent enough for its presence to be detected down to a concentration in air of not more than 1/5 of the lower limit of flammability.

2-2.1. A device, mechanism, or procedure designed to ensure that the maximum water vapor content of the CNG is in compliance with section 2-2 shall be utilized at each dispensing station. This requirement shall not apply to a residential fueling facility or a vehicle-fueling appliance.

2-2.1.1. Procedure may include a monthly report received from the supplying utility specifying the water content of the natural gas, monthly testing of the water vapor content of the natural gas by the dispensing station operator, or another procedure acceptable to the state fire marshal. The dispensing station operator shall make test and procedure records available to the authority having jurisdiction upon request and shall maintain the records for 1 year.

2-2.2. When the authority having jurisdiction has reason to believe that the gas quality is not in compliance with section 2-2.1 of the standard, the authority having jurisdiction may order the dispensing station owner to cease dispensing until gas quality is shown to be in compliance with section 2-2.1 of the standard.

2-2.3. An owner or operator shall not continue to dispense CNG when ordered to cease dispensing under section 2-2.2 of the standard.

History: 1995 AACS.

R 29.4629 Approval.

Rule 29. Section 2-3.1 of the standard is amended to read as follows:

2-3.1 Systems and system components shall be listed or approved, included all of the following:

- (a) A container.
- (b) A pressure relief device, including a pressure relief valve.
- (c) A pressure gauge.
- (d) A pressure regulator.
- (e) A valve.
- (f) A hose and hose connection.
- (g) A vehicle fueling connection.
- (h) An engine fuel system.
- (i) Electrical equipment related to a CNG system.
- (j) A dispenser.
- (k) A water vapor control device or mechanism.

History: 1995 AACS.

R 29.4630 Design and construction of containers.

Rule 30. Sections 2-4.1 and 2-4.1.1 of the standard are amended, section 2-4.7 is added to the standard, and section 2-4.3.1 is deleted from the standard, to read as follows:

2-4.1. A container shall be in compliance with sections 2-4.2 through 2-4.6 of the standard or shall be designed, fabricated, tested, and marked using criteria that incorporate an investigation to determine that the container is safe and suitable for the proposed service, is recommended for the service by the manufacturer, and is acceptable to the state fire marshal.

2-4.1.1. A container shall be fabricated of steel, aluminum, or composite materials. The container shall be designed to be suitable for CNG service and permanently marked CNG by the manufacturer. A container manufactured before the effective date of these rules may be used in CNG service if recommended for CNG service by the container manufacturer and if acceptable to the state fire marshal.

2-4.3.1. Deleted.

2-4.7. An owner or operator of a container that has had a container subjected to heat exposure due to fire shall remove the container from service, unless the owner or operator provides documentation to the state fire marshal substantiating container integrity.

History: 1995 AACS.

R 29.4631 Pressure relief devices.

Rule 31. Section 2-5.3 of the standard is amended to read as follows:

2-5.3. An owner or operator of a container or a pressure vessel that is otherwise in compliance with section 2-4.1 shall equip the container or pressure vessel with a pressure relief device approved by the state fire marshal.

History: 1995 AACS.

R 29.4632 Piping.

Rule 32. Section 2-8.4 of the standard is amended to read as follows:

2-8.4. The following components shall not be used:

(a) A fitting, street ell, or other piping component that is made of cast iron, except for a fitting, street ell, or other piping component that is in compliance with ASTM standards A-536 (grade 60-40-18), A 395, and A-47 (grade 35018).

(b) Plastic pipe, tubing and fittings.

(c) Galvanized pipe and fittings.

(d) Aluminum pipe, tubing and fittings.

Exception no. 1: A refueling connection may be made of nonsparking wrought aluminum alloy suitable for the pressure employed.

Exception no. 2: Aluminum pipe, tubing and fittings may be used downstream of the first-stage pressure regulator in an engine fuel system.

(e) Pipe nipples for the initial connection to a container.

(f) Copper alloy that has a copper content of more than 70%.

History: 1995 AACS.

R 29.4633 Installation of fuel supply containers.

Rule 33. Section 3-3.1 and section 3-3.3 of the standard are amended to read as follows:

3-3.1. Fuel supply containers on vehicles may be located within, below, or above the driver or passenger compartment if all connections to the container or containers are external to, or sealed and vented from, these compartments.

Each container shall be protected by a shield to prevent damage that may occur due to road hazards, loading, unloading, and use of vehicle.

3-3.3. Each container shall be mounted in a rack and each container rack shall be secured to the vehicle body, bed, or frame to prevent damage from road hazards, slippage, loosening or rotation using a method capable of withstanding a static force in the 6 principal directions (see figure 3-3.3) of 8 times the weight of a fully pressurized container.

History: 1995 AACS.

R 29.4634 Installation of venting systems.

Rule 34. Section 3-4.1 of the standard is amended to read as follows:

3-4.1. All pressure relief devices and connections between pressure-carrying components installed within a closed compartment (see section 3-3.1) shall be vented to the outside of the vehicle at a suitable location on the vehicle. The vent outlet shall not terminate in the engine compartment.

History: 1995 AACS.

R 29.4635 Installation of piping.

Rule 35. Section 3-5.6 of the standard is amended to read as follows:

3-5.6. Fuel lines shall be mounted, braced, and supported to minimize vibration and protected against damage, corrosion, and breakage due to strain or wear. A fuel line shall be supported at least every 24 inches (610 mm).

History: 1995 AACS.

R 29.4636 Installation of valves.

Rule 36. Section 3-6.1 is added to the standard, and sections 3-6.2 and 3-6.2.2 of the standard are amended, to read as follows:

3-6.1. Each container shall be equipped with a manual or normally closed remotely actuated shutoff valve connected directly to the container. Remotely actuated valves shall be equipped with a provision to manually bleed the container.

3-6.2. In addition to the valve required by section 3-6.1 of the standard, a manual shutoff valve or a normally closed remotely controlled shutoff valve that is closed when the engine is not operating shall be installed to permit isolation of the container from the remainder of the fuel system. The manual shutoff valve shall be in an accessible location and may not have more than a 90-degree rotation from the open position to the closed position.

3-6.2.2. The manual valve location shall be marked with the words "MANUAL SHUTOFF VALVE." Decals or stencils are acceptable markings.

History: 1995 AACS.

R 29.4637 Installation of fueling connection.

Rule 37. Section 3-9.2 of the standard is amended to read as follows:

3-9.2. The fueling connection receptacle shall be mounted to withstand the breakaway force specified in section 4-11.8 of the standard. The receptacle shall be installed in accordance with the manufacturer's instructions.

History: 1995 AACS.

R 29.4638 Labeling.

Rule 38. Sections 3-11.1.1 and 3-11.1.2 of the standard are amended to read as follows:

3-11.1.1. A label readily visible and located in the engine compartment shall specify all of the following information:

- (a) That the vehicle is a CNG-fueled vehicle.
- (b) The system service pressure.
- (c) The installer's name or company.
- (d) The container retest date or dates or the expiration date.
- (e) The total container water volume in gallons (liters).

3-11.1.2. A label located at the fueling connection receptacle shall specify all of the following information:

- (a) That the vehicle is a CNG-fueled vehicle.

- (b) The system service pressure.
- (c) The container retest date or expiration date.

Exception: If both labels are located at the fueling connection receptacle located in the engine compartment, the labels can be combined into a single label.

History: 1995 AACS.

R 29.4639 System testing.

Rule 39. Section 3-12.1 of the standard is amended to read as follows:

3-12.1. The complete installed assembly shall be leak-tested using natural gas or inert gas (carbon dioxide or nitrogen or a mixture of these).

History: 1995 AACS.

R 29.4640 Maintenance and repair.

Rule 40. Section 3-13.3 of the standard is amended to read as follows:

3-13.3. Pressure relief devices on cylinders shall be maintained in accordance with Compressed Gas Association (CGA) pamphlet S-1.1. Pressure relief devices on all other containers shall be maintained in accordance with the following provisions:

- (a) Pressure relief device channels or other parts that could interfere with the functioning of the device may not be plugged by paint or the accumulation of dirt.
- (b) Compressed natural gas containers shall be stored so as to avoid damage.
- (c) Only qualified personnel shall be allowed to service pressure relief devices.
- (d) Only assemblies or parts manufactured to the original manufacturer's specifications shall be used in the repair of pressure relief devices.

History: 1995 AACS.

R 29.4641 Application.

Rule 41. Section 4-1 of the standard is amended to read as follows:

4-1. This chapter applies to the design, construction, installation, and operation of containers, pressure vessels, compression equipment, buildings and structures, and associated equipment used for the storage and dispensing of CNG as an engine fuel. This chapter does not apply to a residential fueling facility.

History: 1995 AACS.

R 29.4642 Siting.

Rule 42. Sections 4-4.2.3, 4-4.2.4, 4-4.2.6, 4-4.2.8, 4-4.3.2, and 4-4.3.10 of the standard are amended to read as follows:

4-4.2.3. Compression, storage, and dispensing equipment that is outdoors shall be located above the ground, may not be beneath electric power lines or where exposed by failure of the power lines and shall be a minimum of 10 feet (3 m) from the nearest building or line of adjoining property that is or may be built upon or the nearest source of ignition. For fixed electrical equipment, see section 4-12.

4-4.2.4. Compression, storage, and dispensing equipment that is outdoors shall be located as follows:

- (a) Not less than 10 feet (3 m) from the nearest public street or sidewalk line.
- (b) Not less than 5 feet (1.5 m) from driveways.
- (c) Not less than 20 feet (6.1 m) from flammable and combustible liquid dispensers.
- (d) Not less than 20 feet (6.1 m) from loading or unloading risers for aboveground tanks storing flammable or combustible liquids, classes I and II.

(e) Not less than 20 feet (6.1 m) from fill pipes of underground storage tank systems storing flammable or combustible liquids, classes I and II.

(f) Not less than 50 feet (15 m) from the nearest rail of any railroad main track.

4-4.2.6. Combustible storage shall not be permitted within 10 feet (3 m) of any stationary container, compression equipment or dispensing equipment.

4-4.2.8. During outdoor fueling operations, the point of transfer shall be located as follows:

(a) Not less than 10 feet (3 m) from any building, mobile home, public sidewalk, highway, street, road, or line of adjoining property that is or may be built upon.

(b) Not less than 25 feet (7.6 m) from main line railroad track center lines.

(c) Not less than 50 feet (15 m) from outdoor places of public assembly, including school yards, athletic fields and playgrounds.

(d) Not less than 5 feet (1.5 m) from driveways.

(e) Not less than 3 feet (1 m) from storage containers.

4-4.3.2. Deflagration (explosion) venting shall only be provided in an exterior wall or a roof in accordance with NFPA standard no. 68 entitled "Guide for Venting of Deflagrations." Where applicable, snow loads shall be considered.

4-4.3.10. Access doors shall have warning signs with the words "WARNING - NO SMOKING - FLAMMABLE GAS." The wording shall be in plainly legible, bright red letters on a white background with letters not less than 3 inches (76 mm) high.

History: 1995 AACS.

R 29.4643 Installation of piping and hoses.

Rule 43. Section 4-9.3 of the standard is amended, and section 4-9.4 is added to the standard, to read as follows:

4-9.3. The use of hose in an installation shall be limited to the following items:

(a) A vehicle fueling hose.

(b) An inlet connection to compression equipment.

(c) A section of metallic hose that is not more than 36 inches (910 mm) in length in a pipeline to provide flexibility where necessary. Each section shall be installed so that it will be protected against mechanical damage and be readily visible for inspection and shall be installed according to the manufacturer's recommendations. The manufacturer's identification shall be retained in each section.

4-9.4. A bleed valve or valves shall be installed to allow for the controlled release of compressed natural gas to a safe location.

History: 1995 AACS.

R 29.4644 Testing.

Rule 44. Section 4-10.2 of the standard is amended to read as follows:

4-10.2. Pressure relief valves shall be tested according to the manufacturer's recommendations at least every 5 years.

History: 1995 AACS.

R 29.4645 Installation of emergency shutdown equipment.

Rule 45. Sections 4-11.2, 4-11.6, and 4-11.6.1 of the standard are amended to read as follows:

4-11.2. The fill line to a storage container shall be equipped with a backflow check valve located between the compressor and the storage container to prevent the discharge of natural gas from the container in case of line, hose, or fittings rupture.

4-11.6. Emergency shutdown devices shall be provided at the dispensing area and also at a location which is not less than 10 feet (3 m) away from the dispensing area and which is along the means of egress. The devices, when activated, shall shut off the power supply and gas supply at a point before the

compressor and at a point in the fixed piping between the storage container and the dispensing equipment.

4-11.6.1. Emergency shutdown devices shall be easily accessible and distinctly marked for easy recognition with a permanently affixed legible sign which has letters that are not less than 3 inches (76 mm) high.

History: 1995 AACS.

R 29.4646 Installation of electrical equipment.

Rule 46. Section 4-12.1 is added to the standard to read as follows:

4-12.1. The electrical classification under table 4-12 may be reduced, or hazardous areas limited or eliminated, by adequate positive pressure ventilation from a source of clean air or inert gas in conjunction with effective safeguards against ventilator failure by purging methods recognized in NFPA standard no. 496, entitled "Standard for Purged and Pressurized Enclosures for Electrical Equipment." A change of the electrical classification shall be approved by the state fire marshal.

History: 1995 AACS.

R 29.4647 Operation.

Rule 47. Section 4-14.9 of the standard is amended, and sections 4-14.10, 4-14.11, and 4-14.12 are added to the standard, to read as follows:

4-14.9. A warning sign that has the words "STOP MOTOR," "NO SMOKING," "FLAMMABLE GAS" shall be posted at a dispensing station and a compressor area. The location of a sign shall be determined by local conditions. Sign letters shall be not less than 3 inches (76 mm) high so that they are visible and legible from each point of transfer.

4-14.10. Each container filling location that is open to the public shall have an attendant or supervisor on duty who meets the requirements of section 1-9 of the standard.

4-14.11. A container filling location that is not open to the public does not require an attendant or supervisor. The private location may include a card- or key-controlled dispensing device. The person performing the transfer shall meet the requirements prescribed in section 1-9 of the standard. Operating instructions for performing the transfer shall be posted on a legible sign in the immediate vicinity of the point of transfer.

4-14.12. At a location where the time to fill each container is more than 15 minutes, a person is not required to be in attendance if the person performing the transfer meets the requirements of section 1-9 of the standard.

History: 1995 AACS.

R 29.4648 Maintenance.

Rule 48. Section 4-16.4.1 of the standard is amended to read as follows:

4-16.4.1. As a precaution to keep pressure relief devices in reliable operating condition, care shall be taken in the handling or storing of compressed natural gas containers to avoid damage. Care shall also be exercised to avoid the plugging, by paint or other dirt accumulation, of pressure relief device channels or other parts that could interfere with the functioning of the devices. Only qualified personnel shall be allowed to service pressure relief devices. Only assemblies or parts manufactured to the original manufacturer's specifications shall be used in the repair of pressure relief devices.

History: 1995 AACS.

R 29.4649 Vehicle-fueling appliances in commercial applications.

Rule 49. Sections 4-17 and 4.17.7 of the standard are amended to read as follows:

4-17. Vehicle-fueling appliances in commercial applications not located at a private residence.
4-17.7. Vehicle-fueling appliances may not be installed within 10 feet (3 m) of any storage container.

History: 1995 AACS.

R 29.4650 Scope.

Rule 50. Section 5-1.1 of the standard is amended to read as follows:

5-1.1. A residential fueling facility (RFF) is an assembly which is used for the compression and delivery of natural gas into vehicles, including the assemblies associated equipment and piping, and which is located at a private residence. The capacity of an RFF may not be more than 5 SCFM of natural gas. A person may not store CNG at an RFF other than in a vehicle fuel supply container.

History: 1995 AACS.

R 29.4651 System component qualifications.

Rule 51. Section 5-2.3 of the standard is amended to read as follows:

5-2.3. Vehicle-fueling appliances are exempt from the requirements of sections 2-2.1, 4-2, 4-3, 4-4, 4-6, 4-8 through 4-16, and 2-5 through 2-10 of the standard.

History: 1995 AACS.

R 29.4652 Reference publications.

Rule 52. Sections 6-1, 6-1.1, and 6-1.2 of the standard are amended, and sections 6-1.3, 6-1.4, 6-1.5, 6-1.6, 6-1.7, and 6-1.8 are added to the standard, to read as follows:

6-1. The standards specified in this rule are adopted by reference in these rules. Copies of the adopted standards are available for inspection and distribution either at the offices of the State Fire Safety Board, Michigan Department of State Police, Fire Marshal Division, 7150 Harris Drive, Lansing, Michigan 48913 or from the publisher of each standard as listed in the following rules. The cost of the standards at the time of adoption of these rules are as specified.

6-1.1. NFPA publications are available from the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101, telephone number 1-800-344-3555.

NFPA 37, 1990 edition, entitled "Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines." Cost: \$15.50.

NFPA 54, 1992 edition, entitled "National Fuel Gas Code." Cost: \$25.50.

NFPA 59A, 1990 edition, entitled "Standard for the Production, Storage and Handling of Liquefied Natural Gas (LNG)." Cost: \$18.75.

NFPA 68, 1988 edition, entitled "Standard for Venting of Deflagrations." Cost: \$20.75.

NFPA 70, 1993 edition, entitled "National Electrical Code." Cost: \$37.50.

NFPA 220, 1992 edition, entitled "Standard on Types of Building Construction." Cost: \$16.00.

NFPA 259, 1987 edition, entitled "Standard Test Method for Potential Heat of Building Materials." Cost: 50 cents per page.

NFPA 496, 1989 edition, entitled "Standard for Purged and Pressurized Enclosures for Electrical Equipment." Cost: 50 cents per page.

6-1.2. ASME publications are available from American Society of Mechanical Engineers, 345 East 47th Street, New York, New York, 10017, telephone number 1-800-843-2763.

ANSI/ASME B31.3 (1980), entitled "American National Standard Code for Chemical Plant and Petroleum Refinery Piping." Cost: \$411.00. "Boiler and Pressure Vessel Code," section X (1986). Cost: \$215.00.

6-1.3. ASTM publications are available from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103, telephone number 215-299-5585.

ASTM A-47-1984, entitled "Specification for Malleable Iron Castings." Cost:\$14.75.

ASTM A-395-1986, entitled "Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures." Cost:\$14.75.

ASTM A-536-1984, entitled "Specification for Ductile Castings." Cost: \$14.75.

ASTM E-136-1982, entitled "Standard Method of Test Behavior of Materials in a Vertical Tube Furnace at 750° C." Cost: \$14.75.

ASTM 380, entitled "Standard for Metric Practice." Cost: \$14.75.

6-1.4. CGA publications are available from the Compressed Gas Association, Inc. 1725 Jefferson Davis Highway, Ste. 1004, Arlington, Virginia 22202-4100, telephone number (703) 412-0900. CGA S-1.1, entitled "Cylinders for Compressed Gases (1979)." Cost: \$136.00.

6-1.5. U.S. DOT and TC container data is available from the U.S. Department of Transportation, 400 75th Street, SW, Washington, DC 20590 and the Canadian Transport Commission, Transport Canada Building, Place de Ville, Ottawa, Ontario, K1A 0N5.

6-1.6. API publications are available from the American Petroleum Institute, 1220 L Street, NW, Washington, DC 20005, telephone number (202) 682-8042.

API RP 2003, entitled "Protection Against Ignitions Arising Out of Static, Lightning and Stray Currents," Fourth Edition, 1982. Cost \$39.00.

6-1.7. AGA publications are available from the American Gas Association, 1515 Wilson Blvd., Arlington, Virginia 22209, telephone number (703) 841-8400.

ANSI/AGA NGV2, 1992, entitled "Basic Requirements for Compressed Natural Gas Vehicle (NGV) Fuel Containers." Cost: \$82.00.

ANSI/AGA NGV1, 1992, entitled "Requirements for Compressed Natural Gas Vehicles (NGV) Refueling Connection Devices." Cost: \$90.00.

6-1.8. CSA publications are available from the Canadian Standards Association, 178 Rexdale Blvd., Rexdale, Ontario, Canada M9W 1R3, telephone number (416) 747-4044.

CSA B51-1991, entitled "Boiler, Pressure Vessel and Pressure Piping Code." Cost: \$39.00.

History: 1995 AACS.