

CHAPTER 221  
FLAMMABLE AND COMBUSTIBLE LIQUIDS

**661—221.1(101) Scope.** This chapter provides the rules of the fire marshal for safe transportation, storage, handling, and use of flammable and combustible liquids. IFC, 2006 edition, sections 102.1 and 102.2, is adopted by reference.

**661—221.2(101) Definitions.** The following definitions shall apply to rules 661—221.1(101) through 661—221.8(101). These definitions are adopted in addition to those which appear in the International Fire Code, 2006 edition; NFPA 30, Flammable and Combustible Liquids Code, 2003 edition; and NFPA 30A, Code for Motor Fuel Dispensing and Repair Garages, 2003 edition. If a definition adopted in this rule conflicts with a definition included in a code or standard adopted by reference in this chapter, the definition found in this rule shall apply.

*“Fire code official”* means any employee of the fire marshal division of the department of public safety, of any local fire department, or of the department of natural resources if the employee is operating under an agreement between the department of public safety and the department of natural resources.

*“ICC”* means the International Code Council, 5203 Leesburg Pike, Suite 600, Falls Church, VA 22041.

*“IFC”* means the International Fire Code, published by the ICC. *“IFC”* will be followed by a year (e.g., IFC, 2006), which indicates the specific edition of the IFC to which reference is made.

*“Mobile air-conditioning system”* means mechanical vapor compression equipment which is used to cool the driver or passenger compartment of any motor vehicle.

*“NFPA”* means the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269. References to the form *“NFPA xx,”* where *“xx”* is a number, refer to the NFPA standard or pamphlet of the corresponding number.

*“SPCC plan”* means a spill prevention, control and countermeasure plan, as defined in 40 CFR 112, published January 1, 2007.

*“Under dispenser containment”* or *“UDC”* means containment underneath a dispenser that will prevent leaks from the dispenser from reaching soil or groundwater.

**661—221.3(101) Flammable and combustible liquids.** The International Fire Code, 2006 edition, published by the ICC, Chapter 34 and references contained therein, and NFPA 30, Flammable and Combustible Liquids Code, 2003 edition and references contained therein, are adopted by reference as the rules for transportation, storage, handling, and use of flammable and combustible liquids. In any case in which a provision of the IFC conflicts with a provision of NFPA 30, the IFC provision shall apply. Any refinery shall comply with the provisions of this rule and with any applicable provisions of 661—Chapter 201.

**221.3(1)** The IFC, 2006 edition, is adopted with the following amendments:

*a.* In section 3402.1, amend the following definitions:

(1) Delete the definition of combustible liquid and insert in lieu thereof the following:

COMBUSTIBLE LIQUID. A liquid having a closed cup flash point at or above 100°F (38°C) and below 200°F (93°C). Combustible liquids shall be subdivided as follows:

Class II. Liquids having a closed cup flash point at or above 100°F (38°C) and below 140°F (60°C).

Class IIIA. Liquids having a closed cup flash point at or above 140°F (60°C) and below 200°F (93°C).

The category of combustible liquids does not include compressed gases or cryogenic fluids.

(2) Delete the definition of refinery and insert in lieu thereof the following:

REFINERY. A plant in which flammable or combustible liquids are produced on a commercial scale from crude petroleum, natural gasoline or other sources, or in which flammable or combustible liquids are used to produce on a commercial scale fuels intended for use in motor vehicles, whether or not those fuels are flammable or combustible liquids.

*b.* Delete section 3403.1 and insert in lieu thereof the following:

3403.1 Electrical. Electrical wiring and equipment shall be installed and maintained in accordance with NFPA 70, National Electrical Code, 2005 edition, published by NFPA.

*c.* Add the following new sections:

3403.6.12 Each connection to an aboveground tank through which liquid can normally flow shall be provided with an external control valve that is located as close as practical to the shell of the tank. In addition to the control valve or any other normal tank valves, there shall be an emergency internal check valve at each pipe connection to any tank opening below normal liquid level. The emergency internal check valve shall be effectively located inside the tank shell and shall be operable both manually and by an effective heat-activated device that, in case of fire, will automatically close the valve to prevent the flow of liquid from the tank even though the pipelines from the tank are broken.

3403.6.13 Any new or replacement piping connected to an aboveground storage tank shall be double-walled unless it lies entirely within the area of secondary containment.

3403.6.14 Any device dispensing Class I or Class II flammable liquids shall not be constructed or installed less than 100 feet from any existing dwelling unit.

*d.* Delete section 3404.2.8.12 and insert in lieu thereof the following:

3404.2.8.12 Liquid removal. Means shall be provided to recover liquid from the vault. Where a pump is used to meet this requirement, the pump shall not be permanently installed in the vault. Electric-powered portable pumps shall be suitable for use in Class I, Division 1 locations, as defined in NFPA 70, National Electrical Code, 2005 edition.

*e.* Delete section 3404.2.8.17 and insert in lieu thereof the following:

3404.2.8.17 Classified area. The interior of a vault containing a tank that stores a Class I liquid shall be designated a Class I, Division 1 location, as defined in NFPA 70, National Electrical Code, 2005 edition.

*f.* Delete section 3404.2.9.1.1, introductory paragraph, and insert in lieu thereof the following:

3404.2.9.1.1 Required foam fire protection systems. Foam fire protection shall be provided at any refinery and for aboveground tanks, other than pressure tanks operating at or above 1 pound per square inch gauge (psig) (6.89 kPa) when such tank, or group of tanks spaced less than 50 feet (15,240 mm) apart measured shell to shell, has a liquid surface area in excess of 1,500 square feet (139 m<sup>2</sup>), and is in accordance with any of the following:

*g.* Delete section 3404.2.9.1.2.1, introductory paragraph, and insert in lieu thereof the following:

3404.2.9.1.2.1 Where foam fire protection is required, it shall be provided in accordance with NFPA 11, 2005 edition, and shall be of a type or types and amount appropriate to suppress fires involving types and amounts of flammable and combustible liquids found on the premises. Where the flammable or combustible liquid contains more than 10 percent alcohol, the foam shall be alcohol-resistant. Fire-fighting foam shall be stored separately from any area in which flammable and combustible liquids are stored and in an area or areas that will be readily accessible to fire fighters responding to a fire at the facility.

*h.* Amend the exception to section 3404.2.9.1.2.1 by adding the following new numbered paragraphs:

6. The premises is not a refinery.

7. The premises does not include bulk storage of flammable or combustible liquids.

8. The premises does not contain total storage capacity to store one million gallons or more of flammable or combustible liquids.

**221.3(2)** Amend NFPA 30, section 4.3.2.3.3, by adding the following new paragraphs:

(10) Each secondary containment tank shall have top-only openings and shall be either a steel double-walled tank or a steel inner tank with an outer containment tank wall constructed in accordance with nationally accepted industry standards, such as those codified by the American Petroleum Institute, the Steel Tank Institute and the American Concrete Institute. Each tank shall be listed by an independent testing laboratory.

(11) Each fill opening in a secondary containment tank shall be provided with a spill container that will hold at least 5 gallons.

(12) For any secondary containment tank, interstitial tank space shall be monitored by an approved, continuous, automatic detection system that is capable of detecting liquids, including water. An automatic detection system may be either electronically or mechanically operated.

**221.3(3) Plans and plan review fees.**

*a.* The owner of any premises on which flammable or combustible liquids are or will be stored or used is required to submit construction plans to the fire marshal division, prior to commencing initial construction of the facility or prior to commencing any construction at an existing facility which includes the addition or replacement of an aboveground flammable or combustible liquid storage tank. The construction plans shall be sealed by a licensed professional engineer if the facility at which the construction will occur is or will be a refinery or if preparation of the plans by a licensed professional engineer is required by another provision of Iowa law.

Construction for which plans are required to be submitted for review shall not commence until approval of the plan has been received from the fire marshal.

EXCEPTION 1: Submission of construction plans is not required if the total flammable and combustible liquid storage capacity on the premises is or will be 1,100 gallons or less.

EXCEPTION 2: If an SPCC plan has been prepared pursuant to 40 CFR 112 for a facility other than a refinery, a copy of the SPCC plan may be submitted to the fire marshal in lieu of submission of separate construction plans, provided that the SPCC plan includes all of the elements required to be included in construction plans for the specific facility in this subrule. If the fire marshal agrees, copies of portions of the SPCC plan may be submitted in lieu of a copy of the complete plan provided that all elements of construction plans which are required for the specific facility by this subrule are included. If an SPCC plan or portions thereof are submitted to the fire marshal, the person making the submission shall provide any additional information required by the fire marshal to evaluate compliance with the provisions of this chapter and Iowa Code chapter 101. The copy of the SPCC plan or portions thereof submitted to the fire marshal shall clearly identify the licensed professional engineer who prepared the plan or shall be accompanied by a letter making this identification.

*b.* Minimum requirements for plans submitted for review include the following:

(1) Drawings shall show the name of the person, firm or corporation proposing the installation, the location, and the adjacent streets or highways.

(2) In the case of refineries or bulk plants, the drawings shall show, in addition to any applicable features required under subparagraphs (4) and (5), the plot of ground to be utilized and its immediate surroundings on all sides; and a complete layout of buildings, tanks, loading and unloading docks, and heating devices, if any.

(3) In the case of service stations, the drawings shall show, in addition to any applicable features required under subparagraphs (4), (5), and (6), the plot of ground to be utilized; the complete layout of buildings, drives, dispensing equipment, and greasing or washing stalls; and the type and location of any heating device.

(4) In the case of aboveground storage, the drawings shall show the location and capacity of each tank; dimensions of each tank whose capacity exceeds 50,000 gallons; the class of liquid to be stored in each tank; the type of tank supports; the clearances; the type of venting and pressure relief relied upon and the combined capacity of all venting and pressure relief valves on each tank; and the tank control valves and the location of pumps and other facilities by which liquid is filled into or withdrawn from the tanks.

(5) In the case of underground storage, the drawings shall show the location and capacity of each tank; the class of liquids to be stored; and the location of fill, gauge, vent pipes, openings and clearances.

(6) In the case of an installation for storage, handling or use of flammable or combustible liquids within buildings or enclosures at any establishment or occupancy covered in this chapter, the drawing shall be in detail sufficient to show whether applicable requirements are to be met.

*c.* Fees for plan reviews shall apply as follows:

(1) \$100 plus \$25 for each new or replacement tank included in the plan, for any site or facility at which flammable or combustible liquids are or will be stored, except for new construction of a refinery.

(2) \$500 for review of the initial construction plans of a refinery if the projected construction costs are \$100,000,000 or less and \$1,000 for the initial construction plans for a refinery if the projected construction costs are greater than \$100,000,000.

(3) The owner shall submit payment of plan review fees in the form of a check, money order, or warrant payable to Treasurer, State of Iowa.

*d.* Plan review fees shall be refunded to the submitter if the plan review has not been completed and the submitter has not been notified of approval or disapproval of the plans within 60 days of receipt of the complete plans by the fire marshal division.

**221.3(4) Inspections.**

*a.* Any facility at which flammable or combustible liquids are stored is subject to inspection by any fire code official during the regular business hours of the facility. If the facility does not operate under regular business hours, a fire official shall have access to the facility between 8 a.m. and 4 p.m. on any day which is a business day for the state of Iowa, within four hours of notifying the owner of intent to inspect the facility.

*b.* Any inspection of a facility pursuant to this subrule conducted by an employee of the fire marshal division of the department of public safety shall result in an inspection fee of \$100 plus \$25 for each aboveground flammable or combustible liquid storage tank, except that there shall be no fee for an initial inspection or the first reinspection after an initial inspection that is conducted pursuant to the receipt of a complaint alleging that the facility is in violation of any provision of this chapter, 661—Chapter 224 or Iowa Code chapter 101.

*c.* Inspections may be initiated by the inspecting official at random or on any other basis; may be conducted at the request of the owner, operator, or manager of a facility; or may be conducted to investigate allegations made in a complaint. Such a complaint shall be in writing and shall specify the location and nature of the alleged violations. The complainant may or may not be identified. Complainants who identify themselves may request to be notified of the outcome of the inspection conducted in response to the complaint.

**661—221.4(101) Motor fuel dispensing facilities and repair garages.** The International Fire Code, 2006 edition, published by the ICC, Chapter 22 and references contained therein, and NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages, 2003 edition and references contained therein, are adopted by reference as the rules for motor fuel dispensing facilities and repair garages. If any provision of the International Fire Code adopted herein is in conflict with any provision of NFPA 30A, the International Fire Code provision shall apply. The International Fire Code, 2006 edition, Chapter 22, is adopted with the following amendments:

**221.4(1)** Amend Table 2206.2.3 so that:

Each tank with a capacity of not more than 6,000 gallons for motor vehicle fuel dispensing systems and storing a Class I liquid, or with a capacity of not more than 12,000 gallons and storing a Class II or Class III liquid, that is located at a commercial, industrial, governmental, or manufacturing establishment, and that is intended for fueling vehicles used in connection with the establishment, is required to be located at least:

(a) 40 feet away from the nearest important building on the same property;

EXCEPTION: Tanks may be located closer than 40 feet to a building of noncombustible construction.

(b) 40 feet away from any property that is or may be built upon, including the opposite side of a public way;

EXCEPTION: No minimum separation shall be required for any tank that complies with NFPA 30A, section 4.3.2.6.

(c) 100 feet away from any residence or place of assembly.

**221.4(2)** Add the following new section:

2206.7.1.1 Dispensing of E-blend.

2206.7.1.1.1 Definitions.

“E-10” means a blend of petroleum and ethanol including no more than 15 percent ethanol intended for use as a motor vehicle fuel.

“*E-blend*” means a blend of petroleum and ethanol including more than 15 percent ethanol intended for use as a motor vehicle fuel.

2206.7.1.1.2 E-blend may only be dispensed if both of the following apply:

(a) Only a dispenser listed by an independent testing laboratory as compatible with ethanol blended gasoline shall be used to dispense E-blend.

(b) The owner or operator or a person authorized by the owner or operator shall visually inspect the dispenser and the dispenser sump daily for leaks and equipment failure and maintain a record of such inspection for at least one year after the inspection. The record shall be located on the premises of the retail dealer and shall be made available to the department of natural resources or the state fire marshal upon request. If a leak is detected, the department of natural resources shall be notified pursuant to Iowa Code section 455B.386.

**221.4(3)** Add the following new section:

2206.7.10 Under dispenser containment (UDC). When installing a new motor fuel dispenser or replacing a motor fuel dispenser, UDC shall be installed whenever any of the following occurs:

(1) UDC is required by a rule adopted by the environmental protection commission.

NOTE: See 567—subrule 135.3(9), paragraph “h.”

(2) A motor fuel dispenser is installed at a location where there previously was no dispenser; or

(3) An existing motor fuel dispenser is removed and replaced with another dispenser. UDC is not required when only the emergency shutoff, shear valves or check valves are replaced.

UDC shall:

- Be intact and liquid tight on its sides and bottom and at any penetrations;
- Be compatible with the substance conveyed by the piping; and
- Allow for visual inspection and monitoring and access to the components in the containment system.

EXCEPTION: UDC shall not be required for a dispenser which sits directly upon a solid concrete apron.

**221.4(4)** Temporary storage in disaster emergencies. Notwithstanding any provision to the contrary found in this chapter or found in the International Fire Code or NFPA 30A as adopted by reference herein, aboveground petroleum storage tanks may be used to store flammable and combustible liquids in motor fuel dispensing operations, provided that all of the following apply:

a. The facility is in an area covered by a disaster emergency proclamation issued by the governor pursuant to Iowa Code section 29C.6 or, if not in such an area, the facility has applied to the fire marshal and has been approved for storage of flammable and combustible liquids in compliance with this subrule.

b. The facility has suffered damage which has rendered the storage tanks normally used by the facility for flammable and combustible liquids inoperable. Storage of flammable and combustible liquids in compliance with this subrule shall continue only for as long as the normal storage tanks are inoperable and in no event for more than 90 days.

EXCEPTION: In extraordinary circumstances, storage of flammable and combustible liquids in compliance with this subrule may continue for more than 90 days if the facility has sought and received specific written approval from the fire marshal for such storage.

c. The facility has written confirmation from the facility’s insurance provider that insurance coverage will apply while storage of flammable and combustible liquids in compliance with this subrule is occurring.

d. Any aboveground petroleum storage tank used pursuant to this subrule shall be rated or listed by an independent testing laboratory for aboveground storage of flammable and combustible liquids.

e. Any aboveground petroleum storage tank used pursuant to this subrule shall be of no more than 1,000 gallons capacity.

EXCEPTION: A storage tank larger than 1,000 gallons capacity may be used pursuant to this subrule if the facility has received specific written approval from the fire marshal for its use. In reviewing such a request, the fire marshal shall consider, but is not limited to considering, the following factors:

(1) Volume of throughput of the facility.

(2) Ability to meet setback requirements appropriate to the size of the tanks used.

*f.* All electrical service proximate to the storage area shall comply with applicable provisions of NFPA 70, National Electrical Code, 2005 edition. An emergency shutoff control or electrical disconnect shall be installed no less than 20 feet nor more than 100 feet from any fuel-dispensing device at the facility. The control shall be clearly marked “Emergency Shutoff.”

*g.* A 20-pound fire extinguisher with a minimum B:C rating of 40 shall be located no more than 50 feet from the location of any storage tank being used in compliance with this subrule.

*h.* Precautions shall be taken to prevent the ignition of flammable or combustible liquids, including the conspicuous posting of warning signs saying “NO SMOKING” and “NO OPEN FLAME.”

*i.* Aboveground petroleum storage tanks used pursuant to this subrule shall be plumbed into existing dispensers, if practical. If this is impractical, all fueling at the facility shall be by attendant only; no self-service dispensing shall be allowed at the facility.

*j.* Any aboveground petroleum storage tank used in compliance with this subrule shall be located so as to be protected from prospective damage from vehicle collisions and shall be located with due regard to vehicular traffic patterns and the location of property lines and significant buildings, particularly those which are frequently occupied by humans.

**661—221.5(101) Aircraft fueling.** The International Fire Code, 2006 edition, published by the ICC, sections 1106 through 1106.21.1 and references contained therein, and NFPA 407, Standard for Aircraft Fuel Servicing, 2007 edition and references contained therein, are adopted by reference as the rules for aircraft fueling facilities. If any provision of the IFC adopted herein conflicts with any provision of NFPA 407, 2007 edition, the IFC provision shall apply.

**661—221.6(101) Helicopter fueling.** The International Fire Code, 2006 edition, published by the ICC, sections 1107 through 1107.8 and references contained therein, is adopted by reference as the rules for helicopter fueling facilities.

**661—221.7(101) Fuel-fired appliances.** The International Fire Code, 2006 edition, published by the ICC, sections 603 through 603.9 and references contained therein, is adopted by reference as the rules for fuel-fired appliances, except for LP-gas fired appliances, which are subject to the provisions of 661—Chapter 226.

**661—221.8(101) Stationary combustion engines and gas turbines.** The International Fire Code, 2006 edition, Chapter 6 and references contained therein, and NFPA 37, “Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines,” 2006 edition, are adopted by reference as the rules governing the installation and use of stationary combustion engines and gas turbines. If any provision of the IFC, 2006 edition, Chapter 6, adopted herein is in conflict with any provision of NFPA 37, 2006 edition, the provision of the IFC shall apply.

These rules are intended to implement Iowa Code chapter 101.

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