

CHAPTER 91
GENERAL REQUIREMENTS FOR ALL OBJECTS

[Prior to 1/14/98, see 347—Chs 41 to 49]

[Prior to 8/16/06, see 875—Ch 203]

875—91.1(89) Codes and code cases adopted by reference.

91.1(1) *ASME boiler and pressure vessel codes adopted by reference.* The ASME Boiler and Pressure Vessel Code (2007 with 2008a and 2009b addenda) is adopted by reference. Regulated objects shall be designed and constructed in accordance with the ASME Boiler and Pressure Vessel Code (2007 with 2008a and 2009b addenda) except for objects that meet one of the following criteria:

- a. An object with an ASME stamp and National Board Registration that establish compliance with an earlier version of the ASME Boiler and Pressure Vessel Code;
- b. An object within the scope of 875—Chapter 95;
- c. An object with an ASME stamp and National Board Registration that establish compliance with DIN, BSI, JIS, or CSA;
- d. A miniature boiler installed before March 31, 1967;
- e. A power boiler or unfired steam pressure vessel installed before July 4, 1951; or
- f. A steam heating boiler, hot water heating boiler, or hot water supply boiler installed before July 1, 1960.

91.1(2) *ASME code cases.* If the manufacturer of an object listed ASME Code Case 2529, 2568, 2571, or 2571-1 on the manufacturer's data report for the object and the object is otherwise in compliance with all applicable provisions, the object is in compliance with these rules.

91.1(3) *Inspection code adopted by reference.* The National Board Inspection Code (2007 with 2008, 2009, and 2010 addenda) is adopted by reference, and reinstallations, installations, alterations, and repairs after December 22, 2010, shall comply with it.

91.1(4) *Electric code adopted by reference.* The National Electrical Code (2008) is adopted by reference, and reinstallations and installations after January 1, 2010, shall comply with it.

91.1(5) *Piping codes adopted by reference.* The Power Piping Code, ASME B31.1 (2007), ASME B31.1a (2008), and ASME B31.1b (2009), and the Building Services Piping Code, ASME B31.9 (2008), are adopted by reference, and reinstallations and installations after April 14, 2010, shall comply with them up to and including the first valve.

91.1(6) *Control and safety device code adopted by reference.* Controls and Safety Devices for Automatically Fired Boilers (CSD-1) (2009) is adopted by reference, and reinstallations and installations after January 1, 2010, shall comply with it.

91.1(7) *Mechanical code adopted by reference.* Excluding Section 701.1, Chapters 2 and 7 of the International Mechanical Code (IMC) (2009) are adopted by reference effective January 1, 2010.

91.1(8) *Oil burning equipment code adopted by reference.* National Fire Protection Association Standard for the Installation of Oil Burning Equipment, NFPA 31 (2006), is adopted by reference.

91.1(9) *Fuel gas code adopted by reference.* National Fire Protection Association National Fuel Gas Code, NFPA 54 (2009), is adopted by reference.

91.1(10) *Liquefied petroleum gas code adopted by reference.* National Fire Protection Association Liquefied Petroleum Gas Code, NFPA 58 (2008), is adopted by reference.

91.1(11) *Boiler and combustion systems hazards code adopted by reference.* National Fire Protection Association Boiler and Combustion Systems Hazards Code, NFPA 85 (2007), is adopted by reference.

[ARC 8283B, IAB 11/18/09, effective 1/1/10; ARC 8590B, IAB 3/10/10, effective 4/14/10; ARC 9232B, IAB 11/17/10, effective 12/22/10]

875—91.2(89) Safety appliance. No person shall remove, disable or tamper with a required safety appliance except for the purpose of repair or inspection. An object shall not be operated unless all applicable safety appliances are properly functional and operational.

875—91.3(89) Pressure-reducing valves. Where pressure-reducing valves are used, one or more relief or safety valves shall be provided on the low-pressure side of the reducing valve when the piping

equipment on the low-pressure side does not meet the requirements for the full initial pressure. The relief or safety valves shall be located adjoining or as close as possible to the reducing valve. Proper protection shall be provided to prevent injury or damage caused by the escaping fluid from the discharge of relief or safety valves if vented to the atmosphere. The combined discharge capacity of the relief valves or safety valves shall be such that the pressure rating of the lowest pressure piping or equipment shall not be exceeded in case the reducing valve sticks open. If a bypass around the reducing valves is used, a safety valve is required on the low-pressure side and shall be of sufficient capacity to relieve all the fluid that can pass through the bypass without overpressuring the low-pressure side. A pressure gage shall be installed on the low-pressure side of a reducing valve.

875—91.4(89) Blowoff equipment. The blowdown from an object that enters a sanitary sewer system or blowdown that is considered a hazard to life or property shall pass through blowoff equipment that will reduce pressure and temperature. The temperature of the water leaving the blowoff equipment shall not exceed 150 degrees Fahrenheit. If the local jurisdiction has a temperature limit of less than 150 degrees Fahrenheit, the temperature of the water leaving the blowoff equipment shall comply with the limit set by the local jurisdiction. The pressure of the water leaving the blowoff equipment shall not exceed 5 psig. The blowoff piping and fittings between the object and the blowoff tank shall comply with the construction or installation code. All materials used in the fabrication of object blowoff equipment shall comply with the construction or installation code. All blowoff equipment shall be equipped with openings to facilitate cleaning and inspection.

[ARC 8283B, IAB 11/18/09, effective 1/1/10]

875—91.5(89) Location of discharge piping outlets. The discharge from safety valves, safety relief valves, blowoff pipes and other outlets shall be so arranged that there will be no danger of scalding personnel. When the safety valve or temperature and pressure relief valve discharge is piped away from the object to the point of discharge, provision shall be made for properly draining the piping. The size of the discharge piping shall not be reduced from the size of the relief valve.

875—91.6(89) Pipe, valve, and fitting requirements.

91.6(1) Pipes, valves, and fittings subject to the effects of galvanic action shall not be used on objects covered by these rules except where permitted in 875—Chapter 95. Dielectric fittings shall be used where dissimilar metals are joined.

91.6(2) and 91.6(3) Rescinded IAB 11/18/09, effective 1/1/10.

[ARC 8283B, IAB 11/18/09, effective 1/1/10]

875—91.7(89) Electric steam generator.

91.7(1) A cable at least as large as one of the incoming power lines to the generator shall be permanently fastened to and provide grounding of the generator shell.

91.7(2) A suitable screen or guard shall be provided around high-tension bushings and a sign posted warning of high voltage. This screen or guard shall be so located that it will be impossible for anyone working around the generator to accidentally come in contact with the high-tension circuits.

91.7(3) All electrically heated boilers shall meet the applicable standards of the construction or installation code.

875—91.8(89) Alterations, retrofits and repairs to objects.

91.8(1) General. Alterations, retrofits, and repairs shall be made so that the object shall be at least as safe as the original construction. Alterations, retrofits, and repairs shall be done as though new construction and shall comply with the applicable code or codes as adopted in 875—Chapters 90 through 96. A National Board “R” form shall be filed with the division for each alteration, retrofit, or repair.

91.8(2) Lap seam cracks. The shell or drum of an object in which a lap seam crack is discovered along a longitudinal, riveted joint shall be immediately discontinued from use. If the object is not more than 15 years of age, a complete new course of the original thickness may be installed at the discretion of the inspector. Patching is prohibited.

875—91.9(89) Boiler door latches. A watertube boiler shall have the firing doors of the inward opening type, unless such doors are provided with substantial and effective latching or fastening devices or are otherwise so constructed as to prevent closed doors from being blown open by pressure on the furnace side. These latches or fastenings shall be of the positive, self-locking type. Friction contacts, latches, and bolts actuated by springs shall not be used. The foregoing requirements for latches or fastenings shall not apply to coal openings on downdraft or similar furnaces.

All other doors, except explosion doors, not used in the firing of the boiler may be provided with bolts or fastenings in lieu of self-locking latching devices. Explosion doors, if used and located in the setting walls within seven feet of the firing floor or operating platform, shall be provided with substantial deflectors to divert the blast.

875—91.10(89) Clearance.

91.10(1) All objects installed prior to September 20, 2006, shall be so located that adequate space is provided for the proper operation, inspection, and necessary maintenance and repair of the object and its appurtenances.

91.10(2) This subrule applies to installations and reinstallations after September 20, 2006. Minimum clearance on all sides of objects shall be 24 inches, or the manufacturer's recommended service clearances if they allow sufficient room for inspection. Where a manufacturer identifies in the installation manual or any other document that the unit requires more than 24 inches of service clearance, those dimensions shall be followed. Manholes shall have five feet of clearance between the manhole opening and any wall, ceiling or piping that would hinder entrance or exit from the object.

875—91.11(89) Fall protection. Safe access to all necessary parts of boilers over eight feet tall shall be provided by a runway platform or fall protection system consistent with the requirements below.

91.11(1) Runway platform. A steel runway platform in compliance with the criteria of 29 CFR 1910.23 and 1910.27 shall be installed across the tops of objects or at some other convenient level for the purpose of affording safe access. All runways shall have at least two means of exit remotely located from each other.

91.11(2) Fall protection system. A fall protection system shall be in compliance with the requirements of 29 CFR 1910.132.

875—91.12(89) Exit from rooms containing objects. All rooms exceeding 500 square feet of floor area and containing one or more objects having a fuel-burning capacity of 1 million Btu's shall have two means of exit remotely located from each other on each level.

875—91.13(89) Air and ventilation.

91.13(1) Notice concerning other rules. The division and the Iowa department of public safety both enforce requirements concerning air and ventilation. Objects that are covered by both sets of rules must comply with both sets of rules.

91.13(2) Documentation. Documentation of compliance with any requirement of this rule shall be maintained in the boiler room. However, it is not necessary to maintain documentation of the louvered area.

91.13(3) National combustion air standards.

a. Installations and reinstallations. Installations and reinstallations shall comply with the edition of NFPA 31, NFPA 54, NFPA 58, NFPA 85, or IMC currently adopted at rule 875—91.1(89) or with the Iowa combustion air standard in subrule 91.13(4). However, compliance with one of the listed NFPA codes constitutes compliance with this rule only if the object burns the fuel covered by the NFPA.

b. Existing objects. An adequate supply of combustion air shall be maintained for all objects while in operation. Compliance with the current edition of NFPA 31, NFPA 54, NFPA 58, NFPA 85, or IMC as adopted at rule 875—91.1(89) or with subrule 91.13(4) constitutes compliance with this rule. Compliance with an earlier edition of NFPA 31, NFPA 54, NFPA 58, NFPA 85, or IMC constitutes compliance with this rule. However, compliance with one of the listed

NFPA codes constitutes compliance with this rule only if the object burns the fuel covered by the NFPA. Compliance with an earlier version of Iowa's combustion air rule constitutes compliance with this rule. Earlier versions of Iowa's combustion air rule are available for reference at http://www.iowaworkforce.org/labor/boiler_inspection_.htm.

91.13(4) Iowa combustion air standard. A permanent source of outside air shall be provided for each room to permit satisfactory combustion of fuel and ventilation if necessary under normal operations. The minimum ventilation for coal, gas, or oil burners in rooms containing objects is based on the Btu's per hour, required air, and louvered area. The minimum net louvered area shall not be less than 1 square foot. The following table shall be used to determine the net louvered area in square feet:

INPUT (Btu's per hour)	MINIMUM AIR REQUIRED (cubic feet per minute)	MINIMUM LOUVERED AREA (net square feet)
500,000	125	1.0
1,000,000	250	1.0
2,000,000	500	1.6
3,000,000	750	2.5
4,000,000	1,000	3.3
5,000,000	1,200	4.1
6,000,000	1,500	5.0
7,000,000	1,750	5.8
8,000,000	2,000	6.6
9,000,000	2,250	7.5
10,000,000	2,500	8.3

When mechanical ventilation is used, the supply of combustion and ventilation air to the objects and the firing device shall be interlocked with the fan so the firing device will not operate with the fan off. The velocity of the air through the ventilating fan shall not exceed 500 feet per minute, and the total air delivered shall be equal to or greater than shown above.

[ARC 8283B, IAB 11/18/09, effective 1/1/10]

875—91.14(89) Condensate return tank. Condensate return tanks shall be equipped with at least two vents or a vent and overflow pipe to protect against a loose float plugging a single connection.

875—91.15(89) Conditions not covered. Any condition not governed by these rules shall be governed by the construction or installation code.

875—91.16(89) Nonstandard objects. Rescinded IAB 3/12/08, effective 4/16/08.

875—91.17(89) English language and U.S. customary units required. All documentation supplied for the unit including but not limited to the manufacturers' data report, drawings, parts lists, installation manuals, and operating manuals shall be in English, and all measurements shall be in U.S. customary units. All pressure gages, thermometers and other controls and safety devices shall also be in U.S. customary units.

875—91.18(89) National Board registration. Except for cast iron boilers, cast aluminum boilers, and objects governed by 875—Chapter 95, all objects shall be registered with the National Board.

[ARC 8283B, IAB 11/18/09, effective 1/1/10]

875—91.19(89) ASME stamp. Except for water heaters regulated by 875—Chapter 95, all objects shall bear the appropriate ASME stamp. Objects shall not be utilized in a manner inconsistent with the stamp.

[ARC 8283B, IAB 11/18/09, effective 1/1/10]

875—91.20(89) CSD-1 Report.

91.20(1) The installer shall complete a Manufacturer's/Installing Contractor's Report for ASME CSD-1 (CSD-1 Report) for each object except for the following:

- a. An object within the scope of 875—Chapter 95;
- b. An object within the scope of 875—Chapter 96; or
- c. A hot water supply boiler covered by ASME Section IV, Part HLW.
- d. A boiler with a fuel input rating greater than or equal to 12,500,000 Btu per hour, falling within the scope of NFPA 85, Boiler and Combustion Systems Hazards Code.

91.20(2) The owner shall make the CSD-1 Report available for inspection.

[ARC 8283B, IAB 11/18/09, effective 1/1/10; ARC 9232B, IAB 11/17/10, effective 12/22/10]

These rules are intended to implement Iowa Code chapter 89.

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