

STATE OF ARIZONA
ARIZONA BOILER RULES

Applying to boilers, water heaters and pressure vessels

ARIZONA ADMINISTRATIVE CODE

TITLE 20 CHAPTER 5



Compiled and Issued

by the

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH

of

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Revised August 18, 2009

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R20-5-401. Applicability

This Article applies to all boilers, lined hot water heaters and pressure vessels operated in Arizona, except the following:

1. Boilers, lined hot water heaters and pressure vessels regulated by the United States Government;
2. Boilers, lined hot water heaters and pressure vessels operated in private residences or apartment complexes of not more than six units; and
3. Boilers, lined hot water heaters and pressure vessels operated on Indian reservations.
4. A lined hot water heater that does not exceed any of the following:
 - a. Heat input of 200,000 BTU per hour,
 - b. Water temperature of 210° F, and
 - c. Nominal water containing capacity of 120 gallons.

R20-5-402. Definitions

In this Article, unless the text otherwise requires:

1. "Act" means A.R.S. Title 23, Chapter 2, Article 11.
2. "Alteration" means any change in the item described on the original manufacturer's data report which affects the pressure-containing capability of the boiler or pressure vessel, including but not limited to:
 - a. Non physical changes such as an increase in the maximum allowable working pressure either internal or external, or
 - b. A reduction in minimum design temperature of a boiler or pressure vessel requiring additional mechanical tests.
3. "ANSI" means American National Standards Institute, Inc., located at 25 W. 43rd Street, 4th Floor, New York, NY 10036 or at <http://www.ansi.org/>.
4. "Apartment house" means a building with multiple family dwelling units, not used for commercial purposes, including condominiums and townhouses, where boilers are located in a common area outside of the individual dwelling units, such as a boiler room.
5. "Applicant" means an individual requesting permission to act as a special inspector under A.R.S. § 23-485.
6. "ASME Code" means the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Sections I, II, IV, V, VIII and IX, published by ASME International.
7. "ASME International" means a not for profit professional organization that promotes the art, science and practice of mechanical and multidisciplinary engineering and allied sciences throughout the world.
8. "Authorized Inspector" means an authorized representative under A.R.S. § 23-471(1) or a special inspector under A.R.S. § 23-485.
9. "Authorized representative" means the boiler chief or boiler inspector employed by the Division.
10. "Blowdown tank" or "Blowdown separator" means an ASME-stamped vessel designed to receive discharged steam or hot water from a boiler blowoff or blowdown piping system.
11. "Boiler" means a closed vessel in which fluid is heated for use external to itself by the direct application of heat resulting from the combustion of fuel, solid, liquid, or gaseous, or by the use of electricity.

12. "Certificate of Competency" means a person who has passed the National Board Exam.
13. "Certificate Inspection" means an internal inspection, when construction allows; otherwise, it means as complete an inspection as possible.
14. "Condemned" means a boiler or lined hot water heater that has been inspected and found to be unsafe by the Director or authorized inspector and has been stamped or tagged with the code XXX AZ8 XXX.
15. "CSD-1" means Controls and Safety Devices for Automatically Fired Boilers, published by ASME International, incorporated by reference in R20-5-404(A)(4).
16. "Direct fired jacketed steam kettle" means a pressure vessel with inner and outer walls that is subject to steam pressure and stress, is used to boil or heat liquids or to cook food, and falls under the scope of Section VIII, Division 1, Appendix 19 (Electrically Heated or Gas Fired Jacketed Steam Kettles) of the ASME Boiler and Pressure Vessel Code incorporated by reference in R20-5-404(A).
17. "External inspection" means an examination of a boiler or lined hot water heater performed by an authorized inspector when the boiler or lined hot water heater is in operation.
18. "Forced circulation hot water heater" means a hot water heater used for potable water, a hot water heater requiring movement of water to prevent overheating and failure of the tubes or coils, and has no definitive waterline.
19. "Fully attended power boiler" means a power boiler that is operated by an individual who meets the requirements of R20-5-408(C), and whose primary function is the care, maintenance, and operation of the boiler and the equipment associated with the boiler system.
20. "High temperature water boiler" means a boiler in which water is heated and operates at a pressure in excess of 160 psig (1.1 MPa) and/or temperature in excess of 250° F.
21. "Historical boilers" means steam boilers of riveted construction, preserved, restored, or maintained for hobby or demonstration use.
22. "Inspection certificate" means a document issued by the Division for the operation of a boiler, lined hot water heater or direct fired jacketed steam kettles when a certificate inspection has been successfully completed.
23. "Internal inspection" means a complete examination of the internal and external surfaces of a boiler or lined hot water heater by an authorized inspector after the boiler or lined hot water heater is shut down.
24. "Lined hot water heater" means the same as lined hot water storage heater defined in A.R.S. § 23-471(10) as a vessel which is closed except for openings through which water can flow, that includes the apparatus by which heat is generated and on which all controls and safety devices necessary to prevent pressures greater than 160 psig (1100 kPa gage) and water temperature greater than 210° F are provided, in which potable water is heated by the combustion of fuels, electricity, or any other heat source and removed for external use.
25. "MAWP" means maximum allowable working pressure.
26. "National Board Commissioned Inspector" means an individual who holds a valid and current National Board Commission issued by the National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229-1183.
27. "National Board Registration Number" means a unique number issued to a boiler, hot water heater or pressure vessel by the manufacturer and recorded with the National Board of Boiler and Pressure Vessel Inspectors.
28. "NFPA" means National Fire Protection Association.
29. "Non-Standard Boiler" means any boiler, hot water heater or pressure vessel that is not constructed or maintained to the standards incorporated by reference of this Article.
30. "Owner" or "Operator" means any individual or organization, including this state and all political subdivisions of this state, who have title, control or duty to control, the operation of one or more boilers, lined hot water heaters or pressure vessels.
31. "Portable boiler" means a boiler permanently affixed to a trailer with wheels, that is totally self-contained while operating, and not attached to any other object either by pipe, hose or wire.
32. "Relief valve" means an ASME-stamped automatic pressure relieving device designed for liquid service which is actuated by the pressure upstream of the valve and opens further with an increase in pressure above the stamped pressure.
33. "Repairs" means work necessary to restore a boiler, lined hot water heater or pressure vessel to operating condition that complies with this Article.
34. "Safety relief valve" means an ASME-stamped automatically pressure-actuated relieving device designed for use either as a safety valve or as a relief valve.
35. "Safety valve" means an ASME-stamped automatic pressure relieving device designed for steam or vapor service which is actuated by the pressure upstream of the valve and characterized by full opening pop-action.
36. "Secondhand" means a boiler, lined hot water heater or pressure vessel that has changed both location and ownership since original installation.
37. "Shelter" means a permanent structure that provides protection from the weather.
38. "Special Inspector" means any authorized inspector who is issued an Arizona Commission but is not employed by the state of Arizona.
39. "State Identification Number" means a unique number assigned by the Division to a boiler, hot water heater or pressure vessel installed in Arizona.

40. "User" means a person or entity that does not have legal title to a boiler, lined hot water heater or pressure vessel, but has control and responsibility for the operation of a boiler, lined hot water heater or pressure vessel.

R20-5-403. Boiler Advisory Board

- A. Members of the boiler advisory board appointed by the Commission pursuant to A.R.S. § 23-474(2) shall serve for a period of three years. At the end of each three year term, the Commission may extend a member's term an additional three years or replace any member with an individual representing similar interest within the industry. The board shall be composed of persons in the boiler industry and shall be balanced in representation with respect to industry, owner/operators, labor and the public.
- B. The board shall hold an annual meeting and such other meetings as may be appropriate and shall conduct business at times and places arranged by the Commission.

R20-5-404. Standards for Boilers, Lined Hot Water Heaters and Pressure Vessels

- A. The following apply to this Article:

1. An owner or user of a boiler installed, repaired, replaced, or reinstalled in Arizona, six months after the effective date of this Article shall comply with the 2007 ASME Boiler and Pressure Vessel Code, Sections I, II, IV, V, VIII Division 1, 2, 3, IX, and B31.1 Power Piping, and addenda as of July 1, 2007, incorporated by reference. This incorporation does not include any later amendments or editions of the incorporated material. A copy of this referenced material is available for review at the Industrial Commission of Arizona, 800 W. Washington Street, Phoenix, AZ 85007 and may be obtained from ASME International at Three Park Avenue, New York, NY 10016-5990 or at <http://www.asme.org/>.
2. An owner or user of a boiler, lined hot water heater or pressure vessel installed, repaired, replaced, or reinstalled in Arizona, before the effective date of this Article shall comply with subsection (A)(1), or the ASME Boiler and Pressure Vessel Code in effect at the time of the last installation, repair, replacement, or reinstallation of the boiler, lined hot water heater or pressure vessel in Arizona.
3. An owner or user of a gas-fired lined hot water heater installed, operated, repaired, replaced, or reinstalled in Arizona shall comply with the American National Standard for Gas Water Heaters, ANSI Z21.10.3-2004, incorporated by reference. This incorporation does not include any later amendments or editions of the incorporated material. A copy of this referenced material is available for review at the Industrial Commission of Arizona, 800 W. Washington Street, Phoenix, AZ 85007 and may be obtained from ANSI, Attn: Customer Service Department, 25 W. 43rd Street, 4th Floor, New York, NY 10036 or at <http://www.ansi.org/>.
4. An owner or user of a boiler installed, repaired, replaced or reinstalled in Arizona after the effective date of this Article shall comply with the American National Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1-2006, incorporated by reference. This incorporation does not include any later amendments or editions of the incorporated matter. A copy of this referenced material is available for review at the Industrial Commission of Arizona, 800 W. Washington Street, Phoenix, AZ 85007 and may be obtained from ASME International, Three Park Avenue, New York, NY 10016-5990 or at <http://www.asme.org/>.
5. An owner or user of a boiler installed, repaired, replaced, or reinstalled in Arizona before the effective date of this Article shall comply with the American National Standard for Controls and Safety Devices for Automatically Fired Boilers in effect at the time of the last installation, repair, replacement or reinstallation of a boiler in Arizona. As an alternative, an owner or user of a boiler described in this subsection may comply with subsection (A)(4).
6. A permanent source of outside air shall be provided for each boiler and lined hot water heater room to assure complete combustion of the fuel as required by ANSI Z223.1-2006, NFPA 54, National Fuel Gas Code incorporated by reference. This incorporation does not include any later amendments or editions of the incorporated matter. A copy of this referenced material is available for review at the Industrial Commission of Arizona, 800 W. Washington Street, Phoenix, AZ 85007 and may be obtained from ANSI, Attn: Customer Service Department, 25 W. 43rd Street, 4th Floor, New York, NY 10036 or at <http://www.ansi.org/>.

- B. The following registration requirements apply to this Article:

1. All boilers and lined hot water heaters, including reinstalled and secondhand boilers, shall be registered with the National Board of Boiler and Pressure Vessel Inspectors except for:
 - a. Non-standard boilers installed up to six months after the effective date of this Section,
 - b. Cast iron boilers, and
 - c. Cast aluminum boilers.
2. All fired and unfired pressure vessels installed or reinstalled on or after July 1, 2009, shall be registered with the National Board of Boiler and Pressure Vessel Inspectors.

- C. The following installation, maintenance, and repair requirements apply to this Article.

1. An owner or user shall keep a signed copy of the Manufacturer's Data Report for a boiler or lined hot water heater at the location of the boiler or lined hot water heater and make the report available for review upon request from an authorized inspector.
2. A boiler shall have masonry or structural supports of sufficient strength and rigidity to safely support the boiler and its contents without any vibration in the boiler or its connecting piping.

3. There shall be at least 36 in. (915 mm) of clearance on each side of the boiler or lined hot water heater. Alternative clearances according to the manufacturer's recommendations are subject to approval by the Division prior to installation of boiler or lined hot water heater.
4. A boiler with a manhole shall have at least five feet clearance between the boiler manhole and any wall, ceiling, or piping.
5. A newly constructed boiler room in excess of 500 square feet of floor area and containing one or more boilers with a fuel capacity of 1,000,000 BTU per hour or a heating capacity greater than 285 Kw (electric), shall have at least two exits on each level of the boiler or boilers. The owner or user shall ensure each exit is remotely located from other exits.
6. An owner or user shall keep a boiler or lined hot water heater room clean and with no obstructions to the boiler or lined hot water heater.
7. An owner or user shall not store flammable or explosive materials in a boiler or lined hot water heater room.
8. An owner or user shall not store combustibles less than three feet from any part of a boiler or lined hot water heater.
9. If a boiler or lined hot water heater is moved outside Arizona for temporary use or repairs, the owner or user shall not reinstall the boiler or lined hot water heater in Arizona until the owner or user notifies and receives verbal or written approval from the Division under R20-5-419 to reinstall the boiler or lined hot water heater. If the Division grants approval to reinstall the boiler or lined hot water heater, the owner or user shall not operate the reinstalled boiler or lined hot water heater until the owner or user receives an inspection certificate from the Division under this Article.
10. Before a new power boiler or a used or secondhand boiler or pressure vessel is installed, an inspection shall be made by an authorized inspector of this state, or by a National Board Commission Inspector. This inspection is to assess the integrity of the vessel and evaluate the original design specification. Prior to installation, an application shall be filed by the owner or user of the boiler or pressure vessel with the Division for approval. This application shall contain the following information:
 - a. Name of the owner or user;
 - b. Mailing address of owner or user;
 - c. Business telephone number of owner or user;
 - d. Installation name and address;
 - e. Installation date;
 - f. Start up date;
 - g. Name and address of boiler/pressure vessel insurance company;
 - h. Arizona serial number of the boiler/pressure vessel being replaced, if applicable;
 - i. Description of the new, used or secondhand power boiler/ pressure vessel as to include:
 - i. Manufacture's name,
 - ii. Date manufactured,
 - iii. Maximum allowable pressure or temperature of boiler/pressure vessel, and
 - iv. National Board registration number;
 - j. Name, address, business phone number, cell phone number, fax number and state contractor's license number of company or individual that will be installing the object;
 - k. Name, title and phone number of the contact person on the site of installation; and
 - l. Signature, title and date of the person submitting the application.
11. Before the owner or user installing a used boiler or pressure vessel, the boiler or pressure vessel shall pass a hydrostatic test that is witnessed by an authorized inspector, authorized representative or by any National Board Commissioned inspector in accordance with R20-5-411.
12. An owner or user of a portable boiler shall notify an authorized inspector before installing the portable boiler and shall not operate the portable boiler until the owner or user receives an inspection certificate from the Division.

R20-5-406. Repairs and Alterations

- A. If repairs or alterations may affect the working pressure or safety of a boiler, an owner, user, or operator shall consult with an authorized inspector before having the repairs or alterations made. The authorized inspector shall provide the owner, user, or operator information regarding the best method to repair or alter the boiler. The owner, user, or operator shall ensure that an authorized inspector inspects and approves the repairs and alterations after the repairs or alterations are made.
- B. Repairs and alterations to boilers shall conform to the applicable provisions of the National Board Inspection Code, ANSI/NB-23-2007 Edition and 2007 addenda, incorporated by reference. This incorporation does not include any later amendments or editions of the incorporated material. A copy of this referenced material is available for review at the Industrial Commission of Arizona, 800 W. Washington Street, Phoenix, AZ 85007, and may be obtained from the National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229-1183 or at <http://www.nationalboard.org/>.
- C. An owner or user shall not permit an individual to remove or repair a safety appliance of a boiler or lined hot water heater in operation. An owner or user shall not permit a person to remove or repair a safety appliance of a boiler or lined hot water heater not in operation except as provided under the ASME Code. If an owner or user permits a person to remove a safety appliance from a boiler or lined hot water heater as provided under the ASME Code, then the owner or user shall ensure that the safety appliance is reinstalled in proper working order before the boiler or lined hot water heater is placed back into operation.
- D. No person shall alter in any manner a safety valve, relief valve, or safety relief valve, except by an organization qualified in accordance with The National Board Inspection Code, ANSI/NB-23 2007 Edition and 2007 addenda incorporated by

reference. This incorporation does not include any later amendments or editions of the incorporated material. A copy of this referenced material is available for review at the Industrial Commission of Arizona, 800 W. Washington Street, Phoenix, AZ 85007, and may be obtained from the National Board of Boiler and Pressure Vessel Inspectors at 1055 Crupper Avenue, Columbus, OH 43229-1183 or at <http://www.nationalboard.org/>.

- E. Repairs of fittings or appliances shall comply with the requirements of the National Board Inspection Code, ANSI/NB-23-2007 Edition and 2007 addenda incorporated by reference. This incorporation does not include any later amendments or editions of the incorporated material. A copy of this referenced material is available for review at the Industrial Commission of Arizona, 800 W. Washington Street, Phoenix, AZ 85007 and may be obtained from the National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229-1183 or at <http://www.nationalboard.org/>.
- F. Beginning six months after the effective date of this Section replacement of fittings or appliances shall comply with the requirements of the 2007 ASME Boiler and Pressure Vessel Code, Sections I, II, IV, V, VIII, Division 1, 2, 3, IX and B31.1 Power Piping, and addenda, incorporated by reference. This incorporation does not include any later amendments or editions of the incorporated material. A copy of this referenced material is available for review at the Industrial Commission of Arizona, 800 W. Washington Street, Phoenix, AZ 85007. A copy of the incorporated material may also be obtained from ASME International, Three Park Avenue, New York, NY 10016-5990 or at <http://www.asme.org>.

R20-5-407. Inspection of Boilers, Lined Hot Water Heaters, Direct Fired Jacketed Steam Kettles and Issuance of Inspection Certificates

- A. An authorized inspector shall comply with the guidelines set forth in The National Board Inspection Code, ANSI/NB-23-2007 Edition and 2007 addenda, incorporated by reference. This incorporation does not include any later amendments or editions of the incorporated material. A copy of this referenced material is available for review at the Industrial Commission of Arizona, 800 W. Washington Street, Phoenix, AZ 85007 and may be obtained from the National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229-1183 or at <http://www.nationalboard.org/>.
- B. If an owner, user, or operator fails to comply with the requirements for an inspection or pressure test under this Article, the Division shall withhold the inspection certificate until the owner, user, or operator complies with the requirements.
- C. An authorized inspector shall not engage in the sale of any object or device relating to boilers, lined hot water heaters, direct fired jacketed steam kettles or equipment associated with boilers, or lined hot water heaters or direct fired jacketed steam kettles.
- D. Under A.R.S. § 23-485(D), the Special Inspector shall file the inspection reports by entering data into the Division's Web-based inspection entry form, by submitting a paper inspection report issued by the Division or by electronic transfer of data between the insurance company's database and the Division's database. The inspection report shall contain the following:
 - 1. Whether it is a Certificate or non-Certificate inspection;
 - 2. Whether it is an internal or external inspection;
 - 3. Name of location, address and phone number of the object;
 - 4. Name, address and phone number of owner or responsible party;
 - 5. Contact person's name and phone number at the inspection location;
 - 6. State Identification Number;
 - 7. Certificate due date;
 - 8. Certificate duration;
 - 9. Whether the object is active, inactive or scrapped;
 - 10. MAWP permitted or allowed;
 - 11. National Board registration number;
 - 12. Name of the manufacturer and the year the object was built;
 - 13. Special location in plant, if applicable;
 - 14. Boiler type;
 - 15. Purpose of the boiler;
 - 16. Specify type of fuel used;
 - 17. Whether the firing method is automatic, manual or unknown;
 - 18. Whether the fuel train is in compliance with CSD-1, NFPA 85, Z21.10.3 or other;
 - 19. Whether the boiler is fully attended as per R20-5-408(C);
 - 20. Heating Surface/BTU Input/ Kilowatt (Kw) Input, as applicable;
 - 21. Whether the heating surface type is stamped, computed or unknown;
 - 22. Minimum safety valve relief capacity required;
 - 23. Whether the minimum safety valve relief capacity type is BTU/Hr, LBS/Hr or unknown;
 - 24. Number of temperature/pressure controls, as applicable;
 - 25. Owner number assigned by the owner to specifically identify object's location;
 - 26. Inspection date;
 - 27. Whether the certificate is posted;
 - 28. Safety Valve Total Capacity;
 - 29. Safety Valve #1 set pressure;
 - 30. Safety Valve #2 set pressure;
 - 31. Safety Valve #3 set pressure;

- 32. Whether the object has been hydro tested;
 - 33. Hydro Test (psi), if applicable;
 - 34. Whether Pressure/Altitude Gage was tested;
 - 35. Whether of the condition of the object is okay to issue a certificate;
 - 36. Inspection comments, condition of boiler;
 - 37. Violations noted;
 - 38. Inspector name and Arizona Commission number; and
 - 39. National Board Commission number.
- E. The Division shall issue to an owner or user an inspection certificate within 30 calendar days of receipt of an inspection report that documents a boiler, lined hot water heater or direct fired jacketed steam kettle that complies with the Act and this Article. An owner or user of a boiler, lined hot water heater or direct fired jacketed steam kettle shall post the inspection certificate in the establishment where the boiler, lined hot water heater or direct fired jacketed steam kettle is located.
 - F. An owner, user, or operator shall ensure that an authorized inspector tags or stamps a steam boiler with an identification number assigned by the Division immediately after installing, but before operating, a new steam boiler, or when an authorized inspector performs an initial certificate inspection of an existing steam boiler. The identification number shall be at least 5/16" in height and in the following format: AZ-# # # #.
 - G. The Division shall mark with a metal dye stamp a boiler or lined hot water heater identified by the Division as not safe for further service, with the code "XXX AZ8 XXX" which shall designate that the boiler or lined hot water heater is condemned.
 - H. For any conditions not covered by this Article, the applicable provisions of the ASME Code that was in effect in Arizona at the time of the installation of the boiler or lined hot water heater shall apply.

R20-5-408. Frequency of Inspection

- A. An owner, user, or operator of a power boiler shall ensure that an authorized inspector performs a certificate inspection and external inspection of the power boiler every 12 months. An authorized inspector shall perform the external inspection while the power boiler is in operation to ensure that safety devices of the power boiler are operating properly.
- B. An authorized inspector shall perform an internal inspection and pressure test on a boiler, lined hot water heater or pressure vessel if the inspector determines from an external inspection of the boiler, lined hot water heater or pressure vessel that continued operation of the boiler, lined hot water heater or pressure vessel is a danger to the public or worker safety.
- C. The Division shall issue a 12 month inspection certificate to an owner or user to operate a fully attended power boiler if:
 - 1. An owner or user ensures that an authorized inspector performs an external safety inspection and audit of the operational methods and logs of the fully attended power boiler at least every 12 months and performs an internal inspection of the fully attended power boiler at least every 36 months;
 - 2. Continuous boiler water treatment is under the direct supervision of persons trained and experienced in water treatment for the purpose of controlling and limiting corrosion and deposits.
 - 3. Records are available for review, that indicate:
 - a. The date, time, and reason the boiler is out of service; and
 - b. Daily analysis of water samples that adequately show the conditions of the water and elements or characteristics that are capable of producing corrosion or other deterioration to the boiler or its parts; and
 - 4. Controls, safety devices, instrumentation, and other equipment necessary for safe operation are current, in service, calibrated, and meet the requirements of an appropriate safety code for the size boilers, such as NFPA 85, ASME CSD-1 Controls and Safety Devices for Automatically Fired Boilers, National Board Inspection Code ANSI/NB-23, and state requirements.
 - 5. Inspection reports of an authorized inspector document that the fully attended power boiler complies with A.R.S. § 23-471 et seq. and this Article.
- D. An owner, user, or operator of a direct-fired jacketed steam kettle shall ensure that an authorized inspector performs a certificate inspection of the direct-fired jacketed steam kettle every 24 months.
- E. An owner, user, or operator of a heating or process boiler, not exceeding 15 p.s.i. maximum allowable working pressure, steam or vapor, shall ensure that an authorized inspector performs a certificate inspection of the heating or process boiler every 24 months.
- F. An owner or user of a hot water heating or hot water supply boiler, or lined hot water heater shall ensure that an authorized inspector performs a certificate and external inspection of the hot water heating or hot water supply boiler or lined hot water heater at the time the hot water heating or hot water supply boiler or lined hot water heater is installed. An inspection certificate issued by the Division following an inspection under this subsection shall not state an expiration date.

R20-5-409. Notification and Preparation for Inspection

- A. An authorized inspector shall perform a certificate inspection at a time mutually agreeable to the inspector and owner, user, or operator.
- B. Before an authorized inspector performs an internal inspection of a boiler, an owner, user, or operator shall:
 - 1. Cool the furnace and combustion chambers;
 - 2. Drain the water from the boiler;
 - 3. Remove the manhole and handhole plates, wash-out plugs, and inspection plugs in water column connections;

4. Remove insulation or brickwork if necessary to determine the condition of the boiler, headers, furnace, supports, and other parts;
5. Remove the pressure gauge for testing;
6. Prevent any leakage of steam or hot water into the boiler by disconnecting the involved pipe or valve;
7. Close, tag, and padlock the non-return and steam stop valves before opening the manhole or handhole covers and entering any part of the steam generating unit that is connected to a common header with other boilers. Open the free blow drain or cock between the non-return and steam stop valves;
8. Close, tag, and padlock the blowoff valves after draining the boiler: and
9. Open all drains and vent lines.

R20-5-410. Report of Accident

An owner or user shall notify the Division within 24 hours of an explosion, severe overheating, or personal injury involving a boiler, lined hot water heater or direct fired jacketed steam kettle. A person shall not remove or disturb the involved boiler, lined hot water heater, direct fired jacketed steam kettle or parts of the boiler, lined hot water heater or direct fired jacketed steam kettle before an investigation by an authorized inspector, except for the purpose of preventing personal injury or limiting consequential damage.

R20-5-411. Hydrostatic Tests

The owner or user shall perform a hydrostatic or pneumatic pressure test in accordance with the code incorporated by reference in R20-5-404(A) and R20-5-406(B).

R20-5-412. Automatic Low-water Fuel Cutoff Devices or Combined Water Feeding and Fuel Cutoff Devices

- A. An owner, user, or operator shall ensure that low-water fuel cutoff devices or combined water feeding and fuel cutoff devices do not interfere with an operator's or inspector's ability to safely clean, repair, or inspect a boiler or lined hot water heater.
- B. A low-water fuel cutoff device shall have a pressure rating not less than the set pressure of the safety valve or safety relief valve.
- C. In addition to the requirements of subsections (A) and (B), all low-water fuel cutoffs and flow sensing devices shall be constructed and installed in accordance with applicable ASME Code and standards for boilers and steam jacketed kettles in R20-5-404(A).

R20-5-413. Safety and Safety Relief Valves

- A. A valve shall not be placed between a safety valve or a safety relief valve and installed on a boiler or lined hot water heater, or between a safety valve or a safety relief valve and the discharge pipe attached to the boiler or lined hot water heater.
- B. When a power boiler is supplied with feed-water directly from a water main without the use of a feeding apparatus, safety valves shall not be set at a pressure greater than 94% of the lowest pressure obtained in the water main feeding the boiler;
- C. Safety valves, safety relief valves and relief valves shall conform to the requirements of the 2007 ASME Boiler and Pressure Vessel Code, Section I, IV or VIII, and addenda as of January 1, 2008, incorporated by reference as applicable. This incorporation does not include any later amendments or editions of the incorporated material. A copy of this referenced material is available for review at the Industrial Commission of Arizona, 800 W. Washington Street, Phoenix, AZ and may be obtained from the ASME, Three Park Avenue, New York, NY 10016-5990 or at <http://www.asme.org/>.

R20-5-415. Boiler Blowdown, Blowoff Equipment and Drains

- A. Except as provided in this Section, an owner or user of blowdown and blowoff equipment shall comply with the National Board Rules and Recommendations for the Design and Construction of Boiler Blowoff Systems, 1991 Edition, incorporated by reference. This incorporation does not include any later amendments or editions of the incorporated material. A copy of this referenced material is available for review at the Industrial Commission of Arizona, 800 W. Washington Street, Phoenix, AZ 85007 and may be obtained from the National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229-1183 or at <http://www.nationalboard.org/>.
- B. Blowdown from a boiler is a hazard to life and property.
- C. Blowdown from a boiler shall pass through blowdown equipment that reduces pressure and temperature to levels not exceeding 5 p.s.i.g. and 140° F.
- D. The thickness of a blowdown vessel shall be at least 3/16".
- E. All blowdown equipment shall be fitted with openings that allow cleaning and inspection of the equipment.
- F. Blowdown separators may be used with boilers instead of boiler blowdown tanks, provided that blowdown separators are operated with a temperature gauge and water cooler to prevent drain water temperature from exceeding 140° F.
- G. In addition to the requirements of subsections (A) through (F), the following requirements apply to blowdown piping, valves and drains for power boilers: Each power boiler and high temperature water boiler shall be installed and maintained according to ASME Code, Section I and B31.1, incorporated by reference in R20-5-404, at the time of installation.
- H. In addition to the requirements of subsections (A) through (F), the following requirements apply to bottom blowdown or drain valves for heating boilers and hot water heaters:

1. A hot water heating boiler or hot water heater shall have a bottom blowdown or drain pipe connection fitted with a valve or cock connected with the lowest available water space with the minimum size of blowdown piping and valves as required by ASME Code, Section IV, incorporated by reference, in R20-5-404(A).
2. Discharge outlets of blowdown pipes, safety valves and other piping shall be located and structurally supported to prevent injury to individuals.

R20-5-416. Maximum Allowable Working Pressure

- A. The ASME Code under which a boiler was constructed and stamped shall determine the maximum allowable working pressure for the ASME-stamped boiler.
- B. If components in the boiler or hot water system such as valves, pumps, expansion tanks, storage tanks or piping have a lesser working pressure rating than the boiler or hot water heater, the pressure setting for the safety or safety relief valve on the boiler or hot water heater shall be based upon the component with the lowest maximum allowable working pressure rating.

R20-5-417. Maintenance and Operation of Boilers, Hot Water Heaters and Direct Fired Jacketed Steam Kettles

- A. An owner or user of a boiler, hot water heater or direct fired jacketed steam kettle constructed under the ASME Code, Sections I, IV or VIII Division 1, incorporated by reference in R20-5-404(A) shall comply with the manufacturer's maintenance and operation instructions for the boiler, hot water heater or direct fired jacketed steam kettle.
- B. In addition to the requirements of subsection (A), an owner or user of a boiler constructed under the ASME Code, Sections I, IV, shall comply with the following preventive maintenance schedule if the boiler contains the component or system listed.
 1. On a daily basis, the owner or user shall:
 - a. Test the low-water fuel cutoff and alarm, and
 - b. Check the burner flame for proper combustion.
 2. On a weekly basis, the owner or user shall:
 - a. Check for proper ignition, and
 - b. Check the flame failure detection system.
 3. On a monthly basis, the owner or user shall:
 - a. Test all fan and air pressure interlocks,
 - b. Check the main burner safety shutoff valve,
 - c. Check the low fire start switch,
 - d. Test fuel pressure and temperature interlocks of oil-fired units, and
 - e. Test the high and low fuel pressure switch of gas-fired units.
 4. Every six months, the owner or user shall:
 - a. Inspect burner components;
 - b. Check flame failure system components, such as vacuum tubes, amplifier and relays;
 - c. Check wiring of all interlocks and shutoff valves;
 - d. Recalibrate all indicating and recording gauges; and
 - e. Check steam and blowdown piping and valves.
 5. Annually, the owner or user shall:
 - a. Replace vacuum tubes, scanners, or flame rods in the flame failure system according to the manufacturer's instructions;
 - b. Check all coils and diaphragms; and
 - c. Test operating parts of all safety shutoff and control valves.
- C. An owner or user of a power boiler or high temperature boiler shall designate an individual who meets the requirements of subsection (D) to operate the boiler. An owner or user may operate the boiler if the owner or user meets the requirements of subsection (D).
- D. An operator of a power boiler or high temperature water boiler shall meet the following minimum requirements:
 1. Knowledge of and an ability to explain the function and operation of all safety controls of the boiler,
 2. Ability to start the boiler in a safe manner,
 3. Knowledge of all safe methods of feeding water to the boiler,
 4. Knowledge of and the ability to blow down the boiler in a safe manner,
 5. Knowledge of safety procedures to follow if water exceeds or drops below permissible safety levels, and
 6. Knowledge of and the ability to safely shut down the boiler.

R20-5-418. Non-standard Boilers

An owner or user shall remove from service a boiler, hot water heater or pressure vessel that does not bear an ASME stamp unless the boiler owner or user request a variance under R20-5-429.

R20-5-419. Request to Reinstall Boiler or Lined Hot Water Heater

- A. The Division shall grant or deny approval to reinstall a boiler or lined hot water heater within three business days after an owner or user requests approval to reinstall the boiler or lined hot water heater. The order of the Division granting or denying approval to reinstall a boiler shall be in writing.

- B. The Division shall grant approval to reinstall a boiler or lined hot water heater if the boiler or lined hot water heater complies with A.R.S. § 23-471 et seq. and this Article. The Division shall deny approval to reinstall a boiler or lined hot water heater if the boiler or lined hot water heater does not comply with A.R.S. § 23-471 et seq. and this Article.
- C. An order of the Division denying approval to reinstall a boiler shall be final unless an owner or user requests a hearing under A.R.S. § 23-479 within 15 days after the Division mails the order. The owner or user requesting a hearing shall have the burden to prove that a boiler meets the requirements of A.R.S. § 23-471 et seq. and this Article.

R20-5-420. Special Inspector Certificate under A.R.S. § 23-485

A. Review Time-frames.

1. Administrative Completeness Review.

- a. The Division shall determine whether an application to take a written examination or request for a special inspector certificate under A.R.S. § 23-485 is complete within three days of receipt of the application or request. The Division shall inform the applicant whether the application or request is complete or incomplete by written notice. If the application or request is incomplete, the Division shall include in its written notice to the applicant a complete list of the missing information.
- b. The Division shall deem an application or request withdrawn if an applicant fails to file a complete application or request within 10 days of being notified by the Division that the application or request is incomplete, unless the applicant obtains an extension to provide the missing information. An applicant may obtain an extension to submit the missing information by filing a written request with the Division no later than 10 days after the Division mails notice that the application or request is incomplete. The written request for an extension shall state the reasons the applicant is unable to meet the 10-day deadline. If an extension will enable the applicant to assemble and submit the missing information, the Division shall grant an extension of not more than 10 days and provide written notice of the extension to the applicant.

2. Substantive review.

- a. Application to take written examination under A.R.S. § 23-485(A). Within three days after the Division deems an application complete under subsection (B), the Division shall determine whether the applicant is eligible to take the National Board Examination.
- b. Request for special inspector certificate under A.R.S. § 23-485. Within three days after the Division deems a request complete under subsection (C), the Division shall determine whether the applicant meets the criteria of A.R.S. § 23-485 and subsection (C).

3. Overall review. The overall review period shall be six days, unless extended under A.R.S. § 41-1072 et seq.

B. Application to take Written Examination under A.R.S. § 23-485(A).

- 1. An individual requesting to take the written examination under A.R.S. § 23-485(A) shall complete an application to take the National Board Examination and submit the application to the Division at least 45 days before the date of the examination.
- 2. The application to take the National Board Examination shall be filed with the Division. An application is considered filed when it is received at the office of the Division and stamped by the Division with the date of filing.
- 3. An application to take the National Board Examination shall be on a legible form, paper or electronic, issued to the Division, with the following information:
 - a. Full legal name,
 - b. State or country of residency,
 - c. Mailing address,
 - d. Telephone number,
 - e. E-mail address, and
 - f. Employer's name and address.

C. Application for Special Inspector Certificate under A.R.S. § 23-485. An application for a special inspector certificate under A.R.S. § 23-485 is deemed complete under subsection (A)(1) when the following is filed with the Division:

- 1. The applicant provides written documentation that the applicant holds a certificate of competency as an inspector of boilers or lined hot water heaters for a state that has a standard of examination equal to that of Arizona or the applicant is a National Board Commissioned Inspector, and
- 2. The applicant provides proof of employment as a full time inspector for a company conducting business in Arizona and whose duties as an inspector include making inspections of boilers or lined hot water heaters to be used or insured by the company and not for resale.

D. If an applicant meets the criteria of A.R.S. § 23-485 and subsection (C), the Division shall issue a certificate to the applicant under subsection (C). If an applicant fails to meet the criteria of A.R.S. § 23-485 and subsection (C), the Division shall issue a written notice denying eligibility to the applicant. The Commission shall deem the notice denying eligibility final if an applicant does not request a hearing within 15 calendar days after the Division mails the notice.

E. Written Examination under A.R.S. § 23-485(A).

- 1. The written examination described in A.R.S. § 23-485(A) shall be the National Board Examination of the National Board of Boiler and Pressure Vessel Inspectors.
- 2. The Division shall administer the National Board Examination the first Wednesday and Thursday of every March, June, September, and December to eligible applicants. Within two days after the Division administers the National Board

Examination, the Division shall return the examinations of eligible applicants to the National Board of Boiler and Pressure Vessel Inspectors. Examinations shall be graded by the National Board of Boiler and Pressure Vessel Inspectors.

3. The Division shall provide written notice to an applicant of the applicant's grade for the National Board Examination within three days after the Division receives notice of the grade from the National Board of Boiler and Pressure Vessel Inspectors.
4. The Division shall issue a certificate of competency to an applicant who passes the National Board Examination.
- F. Issuance of Special Inspector Certificate. The Division shall issue a special inspector certificate, A.R.S. § 23-485, to an applicant no later than 15 calendar days after the Division determines that an applicant meets the criteria of A.R.S. § 23-485 and subsection (C).
- G. Hearing on Denial of Eligibility for Special Inspector Certificate.
 1. A request for hearing protesting a notice of eligibility shall be in writing and signed by the applicant or the applicant's legal representative. The applicant shall file the request for hearing with the Division.
 2. The Commission shall hold a hearing under A.R.S. § 41-1065. The hearing shall be stenographically recorded.
 3. The Chair of the Commission or designee shall preside over hearings held under this Section. The Chair shall apply the provisions of A.R.S. § 41-1062 et seq. to hearings held under this Section and shall have the authority and power of a presiding officer as described in A.R.S. § 41-1062.
 4. A decision of the Commission to deny or grant eligibility for a special inspector certificate shall be based upon the criteria set forth in A.R.S. § 23-485 and this Section and shall be made by a majority vote of the quorum of Commission members present when the decision is rendered at a public meeting. After a decision is rendered at a public meeting, the Commission shall issue a written decision upon hearing which shall include findings of fact and conclusions of law, separately stated. An order of the Commission denying a special inspector certificate is final unless an applicant files a request for review within 15 days after the Commission mails its order.
 5. A request for review shall be based upon one or more of the following grounds which have materially affected the rights of an applicant:
 - a. Irregularities in the hearing proceedings or any order or abuse of discretion whereby the applicant seeking review was deprived of a fair hearing;
 - b. Misconduct by the Division;
 - c. Accident or surprise which could not have been prevented by ordinary prudence;
 - d. Newly discovered material evidence that could not have been discovered with reasonable diligence and produced at the hearing;
 - e. Excessive or insufficient sanctions or penalties imposed at hearing;
 - f. Error in the admission or rejection of evidence, or errors of law occurring at, or during the course of, the hearing;
 - g. Bias or prejudice of the Division; and
 - h. The order, decision, or findings of fact are not justified by the evidence or are contrary to law.
 6. The Commission shall issue a decision upon review no later than 30 days after receiving a request for review.
 7. The Commission's decision upon review is final unless an applicant seeks judicial review as provided in A.R.S. § 23-483.

R20-5-429. Variance

- A. Any owner or user may apply to the Director for a variance from the requirements of this Article, upon demonstrating the construction, installation, and operation of the boiler or pressure vessel will maintain the same level of safety as prescribed by this Chapter. The Director shall issue a variance if the Director determines that the proponent of the variance has demonstrated the construction, installation, and operation of the boiler or pressure vessel will maintain the same level of safety as prescribed by this Chapter. The variance issued shall prescribe the construction, installation, operation, maintenance, and repair conditions that the owner or user shall maintain.
- B. A variance may be modified or revoked upon application by an owner, user or the Director, on the Director's own motion at any time after six months from issuance if the owner or user has not complied with the variance or if the variance does not protect the health and safety of employees or general public.
- C. The application for a variance shall be made on the form issued by the Division and contains the following information:
 1. Owner or user's name and company name;
 2. Mailing address;
 3. Telephone number;
 4. Fax number;
 5. Contact person;
 6. Contact person's telephone number;
 7. Address or location of proposed variance;
 8. Type of facility to include;
 - a. Variance description;
 - b. Justification for variance;
 - c. Component or system involved;
 - d. Supporting documentation for variance;
 - e. Identify the statute, rule, code or standard to justify the variance; and

9. Printed name and title of owner or user, signature of owner or user and date.
- D. If an owner or user does not agree with the variance issued or revoked by the Director, a request for a hearing under A.R.S. § 23-479 can be made with the Commission.

R20-5-430. Forced Circulation Hot Water Heaters

- A. All water tube or coil-type hot water heaters that require forced circulation to prevent overheating and failure of the tubes or coils shall have a safety control, to prevent burner operation at a flow rate inadequate to protect the hot water heater unit against overheating, at all allowable firing rates. The safety control shall shut down the burner and prevent restarting until an adequate flow is restored.
- B. All water tube or coil-type hot water heaters that require forced circulation to prevent overheating and failure of the tubes or coils, shall have a manually operated remote shutdown switch or circuit breaker and shall be located just outside the hot water heater room door and marked for easy identification. The shutdown switch shall be installed in a manner to safeguard against tampering. If a hot water heater room door is on the building exterior, the switch shall be located just inside the door. If there is more than one door to the hot water heater room there shall be a switch located at each door. The remote shutdown switch or circuit breaker shall disconnect all power to the burner controls.

R20-5-431. Code Cases

Code cases approved for use by the ASME Code Committee are allowed to be used in the design, fabrication and testing of boilers and pressure vessels provided approval from the Chief Boiler Inspector is obtained prior to use.

R20-5-432. Historical Boilers

Historical boilers shall require an initial Certificate inspection by an authorized inspector, followed by a Certificate inspection every three years thereafter if stored inside a shelter, or annually if stored outdoors. The initial Certificate inspection shall include ultrasonic thickness testing of all pressure boundaries. Thinning of the pressure retaining boundary shall be monitored and recorded on the inspection report, in accordance with R20-5-407(D), to the owner and the Division's electronic copy.