



Department of Commerce

Division of Industrial Compliance

John R. Kasich, Governor
David Goodman, Director

February 2013

At its meeting on February 8, 2013, the Ohio Board of Building Standards adopted the rule changes identified as Amendments Group 87. These rule amendments were adopted for an **effective date of March 1, 2013.**

Amendments Group 87 included the following Boiler and Pressure Vessel rules. For your use, a summary of the changes is provided below and the text of these rules can be found immediately following this coversheet:

Rule Number	Rule Title
4101:4-1-01	Definitions and abbreviations
4101:4-2-01	Scope, administration, and enforcement
4101:4-2-02	Types and qualifications of inspectors
4101:4-3-01	Accepted engineering practice and approved standards
4101:4-4-03	Safety devices and controls
4101:4-4-04	Steam boiler blowoff systems
4101:4-7-01	Contractor registration and boiler permits
4101:4-9-01	Existing boilers and pressure vessels

Reason for Amendments: The rules were reviewed and amended to comply with the five year rule review requirement as follows: **4101:4-1-01** to clarify the NBIC references and to deleted the definition of “F”; **4101:4-2-01** to update the RCO reference; **4101:4-2-02** to clarify the NB-263 reference and to provide an optional method of taking the boiler inspector examination; **4101:4-3-01** to update the ASME BPVC to the 2010 edition and to clarify the NB-371, NB-263, NB-27 standards, and to update the NBIC standard; **4101:4-4-03** to remove the word “hour”; **4101:4-4-04** to correct the reference to NB-27; **4101:4-7-01** to correct references to the NBIC parts; and **4101:4-9-01** to correct references to the NBIC parts and to add a owner maintenance clarification. Remaining rules **4101:4-4-01, 4101:4-4-02, 4101:4-4-05, 4101:4-5-01, 4101:4-6-01, 4101:4-8-01, and 4101:4-10-01** are proposed to remain without change.

If you should have any questions regarding these rule changes, please call BBS staff at (614)644-2613.

4101:4-1-01 **Definitions and abbreviations.**

As used in Chapters 4101:4-1 to 4101:4-10 of the Administrative Code,

- (A) "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. Non physical changes such as an increase in the maximum allowable working pressure (internal or external) or design temperature of a boiler or pressure vessel shall be considered an alteration. A reduction in minimum temperature such that additional mechanical tests are required shall also be considered an alteration.
- (B) "ASME" means the "American Society of Mechanical Engineers". Referenced standards, codes, and related technical information developed by this organization can be purchased by logging on to <http://www.asme.org> or by calling 1-800-the-asme.
- (C) "Authorized Inspection Agency" means an entity, accepted by the "National Board," that provides third party inspection services in which boilers and pressure vessels are inspected during construction, repairs, and alterations to verify their conformity with the code of construction adopted by the board of building standards. Authorized inspection agencies employ authorized inspectors.
- (D) "Authorized Inspector" means an individual holding a "National Board" commission with the appropriate endorsement and designated as such by an "Authorized Inspection Agency".
- (E) "Board" means the board of building standards established by section 3781.07 of the Revised Code and authorized by section 4104.02 of the Revised Code to formulate rules and regulations for the construction, installation, repair, conservation of energy, and operation of boilers and for the construction and repair of pressure vessels.
- (F) "Boiler" means a closed vessel in which water is heated, steam is generated, steam is superheated, or any combination thereof, under pressure or vacuum for use externally to itself by the direct application of heat from the combustion of fuels, or from electricity or nuclear energy. The term boiler shall include fired units for heating or vaporizing liquids other than water where these units are separate from processing systems and are complete within themselves.
- (G) "Boiler, high pressure, high temperature water" means a water heating boiler operating at pressures exceeding one hundred sixty psig or temperatures exceeding two hundred fifty degrees Fahrenheit.
- (H) "Boiler, low pressure" means a steam boiler operating at pressures not exceeding

fifteen psig, or a hot water heating boiler operating at pressures not exceeding one hundred sixty psig or temperatures not exceeding two hundred fifty degrees Fahrenheit.

- (I) "Boiler, portable" means a boiler which is primarily intended for temporary use and the construction and usage of which is obviously portable.
- (J) "Boiler, potable water heater" means a boiler used for supplying potable hot water for commercial purposes at pressures not exceeding one hundred sixty psig and temperatures not exceeding two hundred ten degrees Fahrenheit, except that water heaters are exempted when none of the following limitations are exceeded:
- (1) Heat input of two hundred thousand Btu per hour;
 - (2) Water temperature of two hundred ten degrees Fahrenheit;
 - (3) Nominal water-containing capacity of one hundred twenty gallons.
- (K) "Boiler, power" means a boiler in which steam or other vapor, to be used externally to itself, is generated at a pressure of more than fifteen psig.
- (L) "Boiler, process" means a boiler to which all of the following apply:
- (1) The steam in the boiler is either generated or superheated, or both, under pressure or vacuum for use external to itself.
 - (2) The source of heat for the boiler is, in part or in whole, from a process other than the boiler itself.
 - (3) The boiler is part of a continuous processing unit, such as used in chemical manufacture or petroleum refining, other than a steam-generated process unit.
- (M) "Btu" means "British Thermal Unit".
- (N) "Certificate of competency" means the document issued by the superintendent to a person who has passed the examination prescribed by the board of building standards.
- (O) "Certificate of inspection" means a report of the inspection of a boiler as required by sections 4104.11, 4104.12, and 4104.13 of the Revised Code and the rules of the board of building standards. The written report, completed by a general or special

inspector, when filed in the office of the superintendent, shall be the basis on which a certificate of operation may be granted or denied. The certificate of inspection would then be replaced with a certificate of operation, if granted.

- (P) "Certificate of operation" means the certificate issued by the superintendent to the owner or user following the general or special inspector's inspection of a boiler in accordance with section 4104.12 of the Revised Code.
- (Q) "Code stamp" means the permanent "ASME" identifying stamping applied to boilers and pressure vessels which indicates that the vessel has been constructed in accordance with the rules of the board and the applicable section of the "ASME Boiler and Pressure Vessel Code" and has been approved by an authorized inspector.
- (R) "Commission, National Board" means a certificate and renewable commission card issued by the "National Board" to an individual who has satisfied the requirements and the rules of the "National Board."
- (S) "Commission, Ohio" means a document issued by the superintendent pursuant to section 4104.08 of the Revised Code, which authorizes a general or special inspector to inspect boilers and pressure vessels for use in the state of Ohio.
- (T) "Contractor" means any person, firm, partnership, company, or corporation that engages in the practice of installing or making major repairs or modifications to any boiler that is subject to the provisions of Chapters 4101:4-1 to 4101:4-10 and 1301:3-5 of the Administrative Code.
- ~~(U)~~ "F" means the Fahrenheit temperature scale.
- ~~(V)~~(U) "Inspection, external" means the inspection of the exterior parts of a boiler and the fittings, appurtenances, and safety appliances attached thereto while the boiler is under operating conditions.
- ~~(W)~~(V) "Inspection, internal" means a complete visual and physical inspection of the interior of a boiler.
- ~~(X)~~(W) "Inspector, general" means a state of Ohio employee holding a certificate of competency and a valid Ohio commission to inspect boilers and pressure vessels to be used in the state of Ohio.
- ~~(Y)~~(X) "Inspector, special" means an individual who holds a valid "National Board" commission and a valid Ohio commission to inspect boilers and pressure vessels to

be used in the state of Ohio. Special inspectors are typically employed by an insurance company authorized to write boiler and pressure vessel insurance in the state of Ohio but can also be employed as an inspector by the owner-user of the boiler or pressure vessel which is proposed for use or is operating within the state of Ohio. The owner-user must maintain an established inspection program meeting the requirements of the "National Board" publication "NB-371, Accreditation of Owner-User Inspection Organizations (OUIO)" referenced in rule 4101:4-3-01 of the Administrative Code." In their capacity as a special inspector, they are a representative of the state boiler inspection department, acting independently of their relationship with their employer.

~~(Z)~~(Y) "Installation, existing" means any boiler or pressure vessel within the scope of these rules that has been previously approved and issued a certificate of operation.

~~(AA)~~(Z) "Installation, new" means any boiler or pressure vessel that has not yet been placed in service or issued a certificate of operation.

~~(BB)~~(AA) "National Board" or "NB" means the "National Board of Boiler and Pressure Vessel Inspectors." Referenced standards, codes, publications, and other technical information developed by this organization can be purchased and obtained by logging on to <http://www.nationalboard.org> or by calling (614)888-8320.

~~(CC)~~(BB) "NBIC" means the "National Board Inspection Code" as published by the "National Board of Boiler and Pressure Vessel Inspectors" and referenced in rule 4101:4-3-01 of the Administrative Code."

~~(DD)~~(CC) "NFPA" means the "National Fire Protection Association." Referenced standards published by this organization can be purchased by logging on to <http://www.nfpa.org> or by calling (800)344-3555.

~~(EE)~~(DD) "Non-standard" means an existing power boiler or pressure vessel which was installed prior to July 1, 1913 and was not constructed and stamped in accordance with the rules adopted by the industrial commission of Ohio or the Ohio board of building standards.

~~(FF)~~(EE) "Ohio special" means a boiler or pressure vessel which does not fully comply with "ASME" code requirements, but has been approved for use in Ohio by special action of the board of building standards under section 4104.02 of the Revised Code or permitted for use by the board of building appeals under section 3781.19 of the Revised Code.

~~(GG)~~(FF) "Ohio-standard" means an existing boiler or pressure vessel constructed to

meet the rules of the Ohio industrial commission code requirements but not stamped with the applicable "ASME" symbol.

~~(HH)~~(GG) "Owner or user" means any person, firm or corporation owning or operating any boiler or pressure vessel.

~~(H)~~(HH) "Pressure vessel" means a container for the containment of pressure, either internal or external. This pressure may be obtained from an external source or by the application of heat from a direct or indirect source or any combination thereof.

~~(J)~~(II) "psi" means pounds per square inch.

~~(KK)~~(JJ) "psig" means pounds per square inch gage.

~~(L)~~(KK) "Reinstallation" means a boiler or pressure vessel removed from its original setting and re-erected at the same location or a new location without a change of ownership.

~~(MM)~~(LL) "Repair, major" means the process of restoring a boiler, pressure vessel, or component of a boiler or pressure vessel to a safe and satisfactory condition such that the existing design requirements are met.

~~(NN)~~(MM) "Repair, routine" means repairs meeting the conditions prescribed in the "NBIC ~~section RC 2031(a)~~Part 3" and determined acceptable to the superintendent as a routine repair.

~~(OO)~~(NN) "Revised Code" means the general statutes of the state of Ohio as revised and consolidated into titles, chapters, and sections.

~~(PP)~~(OO) "Secondhand" means a used boiler or used pressure vessel which has had a change of ownership and location.

~~(QQ)~~(PP) "Stationary Steam Engine" means an engine or turbine in which the mechanical force arising from the elasticity and expansion action of steam or from its property of rapid condensation or from a combination of the two is made available as a motive power.

~~(RR)~~(QQ) "Superintendent" means the superintendent of the division of industrial compliance created in the department of commerce under section 121.04 of the Revised Code, or the person designated by the superintendent as responsible for the enforcement of rules 4101:4-1-01 to 4101:4-10-01 and 1301:3-5-01 to 1301:3-5-10

of the Administrative Code.

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4/1/99, 1/1/03, 7/1/07

4101:4-2-01 **Scope, administration, and enforcement.**

- (A) All boilers and pressure vessels proposed for use in the state of Ohio shall be designed, constructed, installed, altered, repaired, maintained, and operated in accordance with the rules adopted by the board as prescribed in Chapters 4101:4-1 to 4101:4-10 of the Administrative Code, except as follows:
- (1) Boilers, pressure vessels, and stationary steam engines under federal control or subject to inspection under federal laws;
 - (2) Air tanks located on vehicles operating under the rules of other state authorities and used for carrying passengers, or freight;
 - (3) Air tanks installed on the right of way of railroads and used directly in the operation of trains;
 - (4) Pressure vessels that are under the regulation and control of the state fire marshal under Chapter 3737. of the Revised Code;
 - (5) Boilers and pressure vessels outside the scope of the applicable section of the "ASME Code for Boilers and Pressure Vessels" as referenced in rule 4101:4-3-01 of the Administrative Code;
 - (6) Historical steam boilers of riveted construction, preserved, restored, or maintained for hobby or demonstration use. In accordance with section 4104.33 of the Revised Code, these boilers shall be repaired, altered, inspected and operated in compliance with Chapter 1301:3-4 of the Administrative Code, the rules adopted by the historical boilers licensing board.
- (B) All boilers and pressure vessels proposed for use in the state of Ohio, except those exempt in paragraph (A) of this rule shall be inspected by an authorized inspector during fabrication and construction and upon completion for compliance with the rules of the board. The inservice inspections shall be conducted by general and special inspectors in accordance with rules adopted by the superintendent in Chapter 1301:3-5 of the Administrative Code. The following boilers and pressure vessels shall comply with the rules of the board for construction but shall not be subjected to the superintendent's inspection requirements or contractor registration requirements prescribed in Chapter 1301:3-5 or 4101:4-7, respectively, of the Administrative Code:
- (1) Portable boilers or pressure vessels when located on farms and used solely for agricultural purposes;

- (2) Low pressure boilers which are located in private residences or in apartment houses of less than or equal to five family units (these boilers are regulated by Chapters 4101:8-1 to ~~4101:8-43~~ 4101:8-44 of the Administrative Code known as the "Residential Code of Ohio" or Chapters 4101:2-1 to 4101:2-15 of the Administrative Code known as the "Ohio Mechanical Code");
 - (3) Pressure vessels containing only water under pressure for domestic supply purposes, including those containing air, the compression of which serves only as a cushion or airlift pumping system, when located in private residences or in apartment houses of less than or equal to five family units (these pressure vessels, hot water expansion tanks, and pressure tanks are regulated by the Chapters 4101:2-1 to 4101:2-15 of the Administrative Code known as the "Ohio Mechanical Code" and Chapters 4101: 3-1 to 4101:3-13 of the Administrative Code known as the "Ohio Plumbing Code");
 - (4) Portable boilers used in pumping, heating, steaming, and drilling, in the open field, for water, gas, and oil;
 - (5) Portable boilers used in the construction of and repair to public roads, railroads, and bridges.
- (C) If the owner or user of any boiler disagrees with the inspector as to the necessity for shutting down a boiler or for making repairs or alterations to it, or taking any other measures for safety, the owner or user may appeal the decision of the inspector to the board of building appeals.
- (D) In the event of a conflict, the rules of the board adopted pursuant to section 3781.10 of the Revised Code and known as the "Ohio Building Code," the "Ohio Mechanical Code," and the "Ohio Plumbing Code" shall govern any rule or standards adopted by the board pursuant to section 4104.02 of the Revised Code.
- (E) In any condition not covered by these rules, the applicable section of the "ASME Code for Boilers and Pressure Vessels" as referenced in rule 4101:4-3-01 of the Administrative Code for new installations shall apply when not inconsistent with the provisions of Chapter 4104. of the Revised Code. Should any paragraph, subparagraph, sentence, clause, phrase, provision, or exemption of these rules be declared unconstitutional or invalid for any reason, the invalidity shall not affect the remaining portions or paragraphs.

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4101:4-2-02

Types and qualifications of inspectors.

- (A) Only an "Authorized Inspector" employed by an "Authorized Inspection Agency" shall conduct inspections of boilers and pressure vessels during construction and fabrication to determine compliance with the rules of the board.
- (B) Only a general or special inspector shall conduct inservice periodic inspections for boilers and repair and alteration inspections of boilers and pressure vessels to determine compliance with the rules of the board.
- (C) An applicant for examination as an inspector of boilers and pressure vessels shall be qualified as prescribed in ~~section 3~~ of the "National Board" publication "NB-263, Rules for National Board Inservice and New Construction Commissioned Inspectors" as referenced in rule 4101:4-3-01 of the Administrative Code.
- (D) The written examination administered by the superintendent shall be the "National Board Commission Examination." The examination shall be given four times each year, on the first Wednesday of March, June, September, and December.
- (E) The superintendent may allow an applicant to sit for the examination at an "On-Demand" location accepted by the "National Board" in accordance with "Part 2" of the "National Board" publication "NB-263, Rules for National Board Inservice and New Construction Commissioned Inspectors" as referenced in rule 4101:4-3-01 of the Administrative Code.

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Prior Effective Dates: 7/27/70, 1/1/90, 2/1/96, 1/1/03, 7/1/07

4101:4-3-01

Accepted engineering practice and approved standards.

(A) Where references are made in Chapters 4101:4-1 to 4101:4-10 of the Administrative Code to the applicable section of the "ASME Boiler and Pressure Vessel Code" or to other standards or publications, this rule identifies the specific edition of the code, standard, or publication that is adopted. Conformity to the applicable technical provisions, requirements, recommendations, and determinations in the codes, standards or other referenced publications adopted in "Table 4-3-01" of this rule, is prima-facie evidence of conformity with accepted engineering practice or with an approved standard.

(B) The board of building standards adopts existing published standards by year of issue as shown in "Table 4-3-01" of the Administrative Code as well as amendments, supplements, and addenda subsequently published prior to issuance of the next edition by the same authority in accordance with section 4104.02 of the Revised Code.

Table 4-3-01

Authority	Edition Date	Designation	Title
ASME	2004 <u>2010</u>	BPVC -Section I (see footnote a)	Power Boilers.
ASME	2004 <u>2010</u>	BPVC -Section II	Material Specifications. Part A-Ferrous. Part B-Non-Ferrous. Part C-Welding Rods, Electrodes and Filler Metals. <u>Part D-Properties.</u>
ASME	2004 <u>2010</u>	BPVC -Section III	Nuclear Power Plant Components. <u>Nuclear Facility Components.</u>
ASME	2004 <u>2010</u>	BPVC -Section IV	Heating Boilers.
ASME	2004 <u>2010</u>	BPVC -Section V	Nondestructive Examination.
ASME	2004 <u>2010</u>	BPVC -Section VI	Recommended rules for Care and Operation of Heating Boilers. <u>Recommended Rules for Care and</u>

			<u>Operation of Heating Boilers.</u>
ASME	2004 <u>2010</u>	BPVC -Section VII	Recommended Rules for Care of Power Boilers. <u>Recommended Guidelines for Care of Power Boilers.</u>
ASME	2004 <u>2010</u>	BPVC -Section VIII	Pressure Vessels-Division 1.
ASME	2004 <u>2010</u>	BPVC -Section VIII	Pressure Vessels-Division 2.
ASME	2004 <u>2010</u>	BPVC -Section VIII	Pressure Vessels-Division 3.
ASME	2004 <u>2010</u>	BPVC -Section IX	Welding and Brazing Qualifications.
ASME	2004 <u>2010</u>	BPVC -Section X	Fiberglass <u>Fiber-Reinforced</u> Plastic Pressure Vessels.
ASME	2004 <u>2010</u>	BPVC -Section XI	Rules for Inservice Inspection of Nuclear Coolant Systems. <u>Rules for Inservice Inspection of Nuclear Power Plant Components.</u>
ASME	2004 <u>2010</u>	- <u>BPVC</u>	<u>Case Interpretations: Code Cases.</u>
ASME	2004 <u>2010</u>	B 31.1	Power Piping.
National Board	2004 <u>2011</u>	NBIC	National Board Inspection Code.
National Board	2004 <u>Jul. 2012, Rev.0</u>	- <u>NB-27</u>	A Guide for Blowoff Vessels.
National Board	<u>Rev 16, 10/05 May 2012, Rev. 5</u>	NB-263	<u>Rules for Commissioned</u>

			<u>Inspectors Rules for National Board Inservice and New Construction Commissioned Inspectors.</u>
<u>National Board</u>	<u>Feb. 2011, Rev. 4</u>	<u>NB-371</u>	<u>Accreditation of Owner-User Inspection Organizations (OUIO).</u>

Footnote a: For riveted construction, see "ASME, BPVC-Section I, Power Boilers, Part PR (1971 edition)."

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4/1/99, 4/1/01, 1/1/02, 3/1/05, 7/1/07, 11/1/07

4101:4-4-03 **Safety devices and controls.**

- (A) All boilers and pressure vessels shall be provided with the necessary safety appliances that will prevent pressure and temperature from rising above the design limits. The required safety devices shall be as required in the applicable section of the "ASME Boiler and Pressure Vessel Code" as referenced in rule 4101:4-3-01 of the Administrative Code.
- (B) The operation of a boiler or pressure vessel without the required safety devices is prohibited, except where alternate device(s) are provided for use on a temporary basis.
- (C) Any owner or operator who in any manner loads the safety valve or valves to a greater pressure than that allowed by the certificate of operation shall be subject to the penalty provided in section 4104.99 of the Revised Code.
- (D) The minimum safety or relief valve relieving capacity for electric boilers shall be 3.5 pounds of steam per hour for each kilowatt ~~hour~~ input.
- (E) The discharge of safety valves and other outlets shall be installed so as not to endanger any person.
- (F) Replacement of existing safety devices shall comply with the requirements for new safety devices as prescribed in the applicable section of the "ASME Boiler and Pressure Vessel Code" as referenced in rule 4101:4-3-01 of the Administrative Code.

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4101:4-4-04

Steam boiler blowoff systems.

- (A) The blowoff from boilers may be discharged directly to any place such as a lake, swamp, stream, sump, or open pit provided there is no hazard to life or property. Where a safe place of discharge is not available, a blowoff tank shall be used. The tank shall be designed to separate the flash steam from the water and shall be flashed to a lower pressure system or vented to the atmosphere. The vent shall be large enough to prevent a steam pressure greater than five psig in the blowoff tank. The water from the blowoff tank may be discharged into a building drain or building sewer provided the water temperature does not exceed one hundred forty degrees Fahrenheit.
- (B) When a blowoff tank is elevated above the lowest point of a boiler, provisions shall be made for draining water from the boiler.
- (C) The shell thickness of a blowoff tank shall be not less than one-fourth inch and shall be constructed for a pressure of not less than twenty five per cent of the allowed pressure of the boilers connected to it for boilers up to and including four hundred psig. For boiler pressure greater than four hundred psig, use "Table 4-4-04(C)" for the blowoff tank allowable pressure. Construction of the blowoff tank shall comply with section VIII, division 1, of the "ASME Boiler and Pressure Vessel Code" as referenced in rule 4101:4-3-01 of the Administrative Code and as modified in this rule.

Table 4-4-04(C)

Maximum allowable working pressure of boiler (psig)	Blowoff tank allowable pressure (psig)
3000	400
2250	325
1500	275
1000	200
750	165
500	125

- (D) Blowoff piping between the boiler blowoff valve and the blowoff tank or other safe place of discharge, where the pressure is approximately atmospheric and when there are no intervening valves, shall be constructed in accordance with "Table 4-4-04(D)". All boiler blowoff pipe fittings shall be steel.

Table 4-4-04(D)

Boiler pressure (psig)	Piping pressure (psig)
1501 to 2000	900
901 to 1500	600
601 to 900	400
250 to 600	250
Below 250	150

(E) In lieu of the design requirements of paragraphs (C) and (D) of this rule, the "National Board" publication entitled "NB-27, A Guide for Blowoff Vessels-2004 Edition" as referenced in rule 4101:4-3-01 of the Administrative Code may be used for the design, construction, and arrangement of boiler blowoff equipment.

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4101:4-7-01

Contractor registration and boiler permits.

Unless exempt by paragraph (B) of rule 4101:4-2-01 of the Administrative Code,

- (A) Every contractor or owner shall be registered with the division of industrial compliance before installing or making major repairs or alterations to any boiler. Applications for registration will be obtained from the division of industrial compliance on forms prescribed by the superintendent.
- (B) All contractors or owners performing boiler installations, repairs, or alterations shall register annually with the superintendent. The annual registration fee shall be fifty dollars.
- (C) Every contractor or owner shall apply for and obtain a permit from the division of industrial compliance prior to making the installation of any boiler. The application shall be made on forms prescribed by the superintendent. A processing fee of fifty dollars per boiler shall be submitted with each permit application form.
- (D) Unless the contractor or owner obtains a "National Board "R" Certificate of Authorization" as prescribed in "Part ~~RA3~~" of the "NBIC" referenced in rule 4101:4-3-01 of the Administrative Code, every contractor or owner shall apply for and obtain a permit from the division of industrial compliance prior to making a routine repair or a major repair to an existing boiler . The application shall be made on forms prescribed by the superintendent. A processing fee of fifty dollars per boiler shall be submitted with each permit application form.
- (E) Every contractor or owner performing boiler alterations shall obtain a "National Board "R" Certificate of Authorization" as prescribed in "Part ~~RA3~~" of the "NBIC" referenced in rule 4101:4-3-01 of the Administrative Code. The contractor or owner is not required to apply for or obtain a permit from the division of industrial compliance. However, in accordance with the "NBIC" and rule 4101:4-9-01 of the Administrative Code, authorization from an authorized inspector shall be obtained prior to making the proposed alteration.

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4101:4-9-01

Existing boilers and pressure vessels.

(A) All existing boilers and pressure vessels and the associated equipment, controls, devices, and safeguards shall be maintained in a safe and sanitary condition, in good working order, and free of leaks and defects. The owner or the owner's designated agent shall be responsible for the maintenance of such boilers and pressure vessels and associated equipment, controls, devices, and safeguards.

~~(A)~~(B) The rules of the board shall not be retroactively applied to existing boilers or pressure vessels that are not otherwise being altered, repaired, reinstalled, or relocated. Portions of a boiler or pressure vessel not altered or repaired and not affected by an alteration or repair are not required to comply with the code requirements for a new boiler or pressure vessel.

~~(B)~~(C) Routine boiler repairs such as piping or tube replacement or repairs considered general maintenance may be made without inspection provided that application is made for a permit and approval has been obtained from a general or special inspector prior to the repair. In the case where the contractor or owner making the routine repair has obtained a "National Board "R" Certificate of Authorization", the authorized inspector shall authorize the routine repair prior to the work being performed. If the repair requires welding, it shall be in accordance with the provisions of section IX of the "ASME Boiler and Pressure Vessel Code" as referenced in rule 4101:4-3-01 of the Administrative Code.

~~(C)~~(D) Where a major repair or alteration (including a re-rating) is necessary or desired on an existing boiler which bears the stamp of the appropriate "ASME" symbol or which is stamped with a state of Ohio boiler number, the repair or alteration shall comply with the requirements of "Part ~~RC~~" or "Part ~~RD3~~" of the "NBIC" as referenced in rule 4101:4-3-01 of the Administrative Code. The repair or alteration shall meet the requirements for the conditions under which it will be operated.

(1) In accordance with rule 4101:4-7-01 of the Administrative Code, unless the contractor or owner has obtained a "National Board "R" Certificate of Authorization", all contractors or owners shall apply for a permit from the division of industrial compliance to make proposed repairs and the repairs shall be approved by a special or general inspector. A repair report, executed and signed by the special or general inspector, shall be filed with the superintendent on forms provided.

(2) In accordance with the "NBIC," contractors or owners performing boiler alterations shall obtain a "National Board "R" Certificate of Authorization" prior to making any alterations. All alterations shall be authorized and approved by an authorized inspector.

~~(D)~~(E) Where a major repair or alteration (including a re-rating) is necessary or desired

on an existing boiler or pressure vessel which does not bear the appropriate "ASME" symbol stamp or which is not stamped with a state of Ohio boiler number, the boiler or pressure vessel shall be evaluated by the superintendent and required to meet the applicable requirements of the "ASME Boiler and Pressure Vessel Code" referenced in rule 4101:4-3-01 of the Administrative Code. Otherwise, the boiler or pressure vessel shall be retired from use.

~~(E)~~(F) Repairs made to an existing "Ohio Special" boiler or pressure vessel shall be done in accordance with paragraph ~~(B)~~(C), ~~(C)~~(D)(1), or ~~(G)~~(H)(1) of this rule, as applicable.

~~(F)~~(G) Alterations, including re-ratings, made to an existing "Ohio Special" boiler or pressure vessel shall be approved, prior to the alteration, by the board of building standards in accordance with the special procedure outlined in rule 4101:4-5-01 of the Administrative Code for boilers and pressure vessels of special design.

~~(G)~~(H) Where a major repair or alteration (including a re-rating) is necessary or desired on an existing pressure vessel which bears the stamp of the appropriate "ASME" symbol, the repair or alteration shall comply with the requirements of "Part ~~RC~~RD" or "~~Part RD3~~" of the "NBIC" as referenced in rule 4101:4-3-01 of the Administrative Code. The repair or alteration shall meet the requirements for the conditions under which it will be operated.

(1) Unless the contractor or owner has obtained a "National Board "R" Certificate of Authorization", all contractors or owners shall notify the division of industrial compliance prior to making repairs to an existing pressure vessel and the repairs shall be approved by a special or general inspector. A repair report, executed and signed by the special or general inspector, shall be filed with the superintendent on forms provided.

(2) In accordance with the "NBIC", contractors or owners performing pressure vessel alterations shall obtain a "National Board "R" Certificate of Authorization" prior to making any alterations. All alterations shall be authorized and approved by an authorized inspector.

~~(H)~~(I) Whenever repairs are made to fittings, safety devices, or appliances or it becomes necessary to replace them, the work shall comply with the requirements for new installations as prescribed in the applicable section of the "ASME Boiler and Pressure Vessel Code" as referenced in rule 4101:4-3-01 of the Administrative Code.

~~(I)~~(J) An existing stationary boiler or pressure vessel which bears the appropriate "ASME" symbol or which is stamped with a state of Ohio boiler number may be reinstalled or relocated within Ohio, provided that the installation complies with the

applicable section of the "ASME Boiler and Pressure Vessel Code" as referenced in rule 4101:4-3-01 of the Administrative Code and an inspection is made by a special or general inspector prior to operation. The fittings and appliances shall comply with the requirements for a new installation.

~~(J)~~(K) A secondhand boiler or pressure vessel stamped with the appropriate "ASME" symbol or having the standard stamping of another state that has adopted rules of construction equivalent to those of Ohio may be installed for use in the state of Ohio provided that application is made for the installation, the manufacturer's data report, indicating that the boiler or pressure vessel was inspected during construction by an authorized inspector, is filed in the office of the superintendent, and an inspection is made by a special or general inspector prior to operation. The inspector shall submit a report to the superintendent which contains a facsimile of the code stamping, a statement concerning any corrosion or other deteriorating conditions and the extent and location of any welded or riveted repairs. Upon approval of a secondhand boiler by the superintendent, a certificate of operation shall be issued.

~~(K)~~(L) Except as permitted in paragraph ~~(J)~~(K) of this rule, an existing boiler or pressure vessel that does not bear the appropriate "ASME" symbol, was not registered with the "National Board," does not have a state of Ohio boiler number stamped upon it, or does not have an "Ohio Special" serial number tagged upon it is prohibited from reinstallation or relocation within the state of Ohio.

~~(L)~~(M) The maximum allowable steam working pressure for cast iron boilers, except for hot water boilers, shall be fifteen psig.

~~(M)~~(N) The maximum allowable working pressure on the shell or drum of an existing nonstandard boiler shall be determined by the strength of the weakest section of the structure, computed from the thickness of the plate, the tensile strength of the plate, the efficiency of the longitudinal joint or the tube ligaments, the inside diameter of the weakest course and the factor of safety allowed by these rules.

$(S)(t)(E)/(R)(F)$ = Maximum allowable working pressure, psig.

Where:

S = ultimate tensile strength of shell plates, psi.

When the ultimate tensile strength, "S", of steel or wrought-iron shell plates is not known, it shall be taken as fifty-five thousand psi for steel and forty-five thousand psi for wrought-iron.

t = minimum thickness of shell plate, in weakest course, inch.

E = efficiency of longitudinal joint.

For riveted construction, "E" shall be determined by rules given in paragraph "PR-15" of the 1971 edition of the "ASME Boiler and Pressure Vessel Code, section I."

For tube ligaments, "E" shall be determined by rules "PG-52" or, "PG-53" of the "ASME Boiler and Pressure Vessel Code, section I" and "PR-25", of the 1971 edition of the "ASME Boiler and Pressure Vessel Code, section I."

R = inside radius of the weakest course of the shell or drum in inches.

F = factor of safety permitted.

- (1) When computing the ultimate strength of rivets in shear, the following values in pounds per square inch of the cross-sectional area of the rivet shank (after driving) shall be used:

Strength of existing rivets in shear

Type of rivet	Strength
Iron rivet in single shear	38,000
Iron rivet in double shear	76,000
Steel rivets in single shear	44,000
Steel rivets in double shear	88,000

- (2) When the diameter of the rivet holes in the longitudinal joints of a boiler is not known, the diameter and cross sectional area of rivets, after driving, may be ascertained from the following table or by cutting out one rivet in the body of the joint:

Sizes of rivets in inches based on plate thickness

Thickness of plate, inches.	1/4	9/32	5/16	11/32	3/8	13/32
Diameter of rivet after driving, inches.	11/16	11/16	3/4	3/4	13/16	13/16

Thickness of plate, inches.	7/16	15/32	1/2	9/16	5/8	-
Diameter of rivet after driving, inches.	15/16	15/16	15/16	17/16	17/16	-

(3) The resistance of steel to crushing shall be taken as ninety-five thousand psi.

(4) The lowest factor of safety permissible on existing installations shall be 4.5 excepting for horizontal return tubular boilers having continuous longitudinal lap seams more than twelve feet in length where the factor of safety shall be 8, and when this latter type of boiler is removed from its existing setting, it shall not be reinstalled for pressure in excess of fifteen psig. Reinstalled or secondhand nonstandard boilers shall have a minimum factor of safety of 6 when the longitudinal seams are of lap riveted construction, and a minimum factor of 5 when the longitudinal seams are of butt and double strap construction. A boiler constructed of wrought iron shall have a factor of safety of 7. Upon inspection of the boiler, if conditions are found which justify a reduction of the safe working pressure, the factor of safety as stated above shall be appropriately increased.

~~(N)~~(O) The maximum allowable working pressure of a nonstandard low pressure steam boiler shall not exceed fifteen psig.

~~(O)~~(P) The maximum allowable working pressure of a nonstandard boiler constructed principally of cast iron or constructed of a cast iron shell or heads and steel tubes shall not exceed thirty psig for hot water service.

~~(P)~~(Q) The maximum allowable working pressure of a nonstandard water tube boiler, the tubes of which are secured to cast iron or malleable iron headers, or which have cast iron mud drums, shall not exceed one hundred sixty psig for steam service.

~~(Q)~~(R) If in the judgment of the inspector a low pressure boiler is unsafe for operation at the pressure previously approved, the pressure shall be reduced, proper repair made, or the boiler retired from service.

~~(R)~~(S) Nonstandard pressure vessels except those exempt in section 4104.04 of the Revised Code and paragraph "U-1" of the "ASME Boiler and Pressure Vessel Code, section VIII", are prohibited for use in excess of fifteen psi internal or

external pressure.

~~(S)~~(T) Any owner or operator who in any manner loads the safety valve or valves to a greater pressure than that allowed by the certificate of operation shall be subject to the penalty provided in section 4104.99 of the Revised Code.

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CERTIFIED ELECTRONICALLY

Certification

02/08/2013

Date

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