



**Department
of Commerce**

Division of Industrial Compliance
John R. Kasich, Governor
Andre T. Porter, Director

November 2014

At its meeting on October 24, 2014, the Ohio Board of Building Standards adopted the rule changes identified as Amendments Group 89. These rule amendments were adopted for an **effective date of January 1, 2015.**

Amendments Group 89 included the following amended Ohio Boiler and Pressure Vessel rules. For your use, a summary of the changes is provided below and the text of the rules can be found immediately following this coversheet:

Rule Number	Tagline	Effective date
4101:4-1-01	Definitions and abbreviations.	January 1, 2015
4101:4-3-01	Accepted engineering practice and approved standards.	January 1, 2015
4101:4-4-03	Safety devices and controls.	January 1, 2015
4101:4-9-01	Existing boilers and pressure vessels.	January 1, 2015
4101:4-10-01	Licensure and attendance requirements of operators.	January 1, 2015

Reason for Amendments: **4101:4-1-01** to add a quotation mark in paragraph (T), to add the word “controls” to paragraph (U), to add the definition of “Qualified Individual”(KK); **4101:4-3-01** to add the ASME CSD-1 and NFPA 85 standards to the list of approved standards ; **4101:4-4-03** to add the word “controls” for clarification of paragraphs (A), (B), and (F) and to add a pointer to rule 4101:4-10-01 for clarification in paragraph (G); **4101:4-9-01** to add the word “controls” and a pointer to rule 4101:4-10-01 for clarification in paragraph (I); and **4101:4-10-01(rescind and adopt new)** to revise paragraph (A) to be consistent with Section 4104.05 of the Revised Code, to revise paragraph (B)(1) for clarification and consistency with other paragraph construction, to revise paragraph (B)(2) for clarification, to delete old paragraph (C) (definition of horsepower) consistent with changes made to Section 4104.05 of the Revised Code, to reword and renumber old paragraph (D) for clarification, and to add new provisions in paragraphs (B)(4) and (B)(5) permitting certain automatically operated boilers that conform to ASME CSD-1 and NFPA 85 to be operated without the presence of a licensed operator.

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) "Inspection, external" means the inspection of the exterior parts of a boiler and the fittings, appurtenances, controls, and safety appliances attached thereto while the boiler is under operating conditions.
- (V) "Inspection, internal" means a complete visual and physical inspection of the interior of a boiler.
- (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.
- (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.

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

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

(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.

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

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

(KK) "Qualified individual" means a service technician trained and thoroughly knowledgeable about the installation, operation, maintenance and service of the specific boiler fuel-burning system, controls, and safety devices.

~~(KK)~~(LL) "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.

~~(LL)~~(MM) "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.

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

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

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

~~(PP)~~(QQ) "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.

~~(QQ)~~(RR) "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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Five Year Review (FYR) Dates: 02/08/2018

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Certification

11/20/2014

Date

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Rule Amplifies: 4104.01, 4104.08, 4104.12
Prior Effective Dates: 10/1/66, 11/15/73, 12/1/85, 9/1/94, 2/1/96, 1/1/98,
4/1/99, 1/1/03, 7/1/07, 3/1/13

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	2010	BPVC -Section I (see footnote a)	Power Boilers.
ASME	2010	BPVC -Section II	Material Specifications. Part A-Ferrous. Part B-Non-Ferrous. Part C-Welding Rods, Electrodes and Filler Metals. Part D-Properties.
ASME	2010	BPVC -Section III	Nuclear Facility Components.
ASME	2010	BPVC -Section IV	Heating Boilers.
ASME	2010	BPVC -Section V	Nondestructive Examination.
ASME	2010	BPVC -Section VI	Recommended Rules for Care and Operation of Heating Boilers.
ASME	2010	BPVC -Section VII	Recommended Guidelines for Care

			of Power Boilers.
ASME	2010	BPVC -Section VIII	Pressure Vessels-Division 1.
ASME	2010	BPVC -Section VIII	Pressure Vessels-Division 2.
ASME	2010	BPVC -Section VIII	Pressure Vessels-Division 3.
ASME	2010	BPVC -Section IX	Welding and Brazing Qualifications.
ASME	2010	BPVC -Section X	Fiber-Reinforced Plastic Pressure Vessels.
ASME	2010	BPVC -Section XI	Rules for Inservice Inspection of Nuclear Power Plant Components.
ASME	2010	BPVC	Code Cases.
ASME	2010	B 31.1	Power Piping.
<u>ASME</u>	<u>2012</u>	<u>CSD-1</u>	<u>"Controls and Safety Devices for Automatically Fired Boilers."</u>
<u>NFPA</u>	<u>2011</u>	<u>NFPA 85</u>	<u>"Boiler and Combustion Systems Hazards Code"</u>
National Board	2011	NBIC	National Board Inspection Code.
National Board	Jul. 2012, Rev.0	NB-27	A Guide for Blowoff Vessels.
National Board	May 2012, Rev. 5	NB-263	Rules for National Board Inservice and New Construction Commissioned Inspectors.

National Board	Feb. 2011, Rev. 4	NB-371	Accreditation of Owner-User Inspection Organizations (OUIO).
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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, 3/1/13

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

- (A) All boilers and pressure vessels shall be provided with the necessary safety appliances and controls that will prevent pressure and temperature from rising above the design limits. The required safety devices and controls 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 or controls 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 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 and controls shall comply with the requirements for new safety devices and controls 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.
- (G) When an owner wishes to install safety devices and controls which will enable a new or an existing boiler to be operated without continuous, manned attendance by a licensed operator, the requirements of paragraph (B)(4) or (B)(5) of rule 4101:4-10-01 of the Administrative Code shall be met.

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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.
- (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.
- (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.
- (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 3" 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.

- (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.
- (F) Repairs made to an existing "Ohio Special" boiler or pressure vessel shall be done in accordance with paragraph (C), (D)(1), or (H)(1) of this rule, as applicable.
- (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.
- (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 3" 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.
- (I) Whenever repairs are made to fittings, safety devices, ~~or~~ appliances, or controls or it becomes necessary or desirable 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. When an owner wishes to install safety devices and controls which will enable an existing boiler to be operated without continuous, manned attendance by a licensed operator, the requirements of paragraph (B)(4) or (B)(5) of

rule 4101:4-10-01 of the Administrative Code shall be met.

- (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.
- (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.
- (L) Except as permitted in paragraph (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.
- (M) The maximum allowable steam working pressure for cast iron boilers, except for hot water boilers, shall be fifteen psig.
- (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
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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.
- (O) The maximum allowable working pressure of a nonstandard low pressure steam boiler shall not exceed fifteen psig.
- (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.
- (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.
- (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.

- (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.
- (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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1/1/03, 7/1/07, 3/1/13

4101:4-10-01**Licensure and attendance requirements of operators.**

(A) In accordance with section 4104.05 of the Revised Code, no person shall operate a low pressure steam boiler that has more than three hundred sixty square feet of heating surface, a power steam boiler that has more than three hundred sixty square feet of heating surface, or a stationary steam engine operating at more than thirty horsepower, unless one of the following applies to that person:

(1) The person holds the required license as specified in section 4104.05 of the Revised Code, or

(2) The person is working under the direct supervision of a person holding the required license as specified in section 4104.05 of the Revised Code.

(B) The operator described in paragraph (A) of this rule shall maintain continuous, manned attendance during all times of operation of a steam boiler that has more than three hundred sixty square feet of heating surface or a stationary steam engine operating at more than thirty horsepower, except as follows:

(1) The continuous, manned attendance by the operator during all times of operation of such steam boiler or stationary steam engine may occur from a central control room on the premises when the steam boiler or stationary steam engine can be monitored, controlled, and shut down from that central control room by the operator and is equipped with manual operational resets.

(2) The steam boiler may be operated without continuous, manned attendance for a maximum length of time equal to the time it takes for the boiler to go into a low water condition when subjected to an annual evaporation test conducted in accordance with the "ASME Boiler and Pressure Vessel Code, Section VI, 7.05 (H)" referenced in rule 4101:4-3-01 of the Administrative Code.

(3) The continuous, manned attendance by the operator during all times of operation of a non-solid-fuel- fired steam boiler or stationary steam engine is not required when the superintendent of the division of industrial compliance has approved a site-specific, detailed written plan to provide for automated electronic monitoring of the steam boiler or stationary steam engine which utilizes controls that contain all operational functions, are equipped with manual operational resets, and are labeled for the intended operation, provided that all of the following apply:

(a) The control equipment must be located within the same complex or production facility premises;

(b) A person licensed under section 4104.19 of the Revised Code is present at all times within the same complex or production facility premises and is available to respond to an emergency condition when summoned by the automated electronic monitoring system;

- (c) A secondary means of alerting such licensed person is within the same complex or production facility premises in the event of failure of the primary electronic monitoring system;
 - (d) A qualified individual as defined in rule 4101:4-1-01 of the Administrative Code performs annual operational tests on the automated electronic monitoring system to verify that the system is maintained in accordance with that original manufacturer specification; and
 - (e) A copy of such dated and signed service report or checklist, listing each control and safety device tested with the manufacturer's name, model number, set point, and actual operational test point is provided to the superintendent of the division of industrial compliance upon request. Failure to produce such service report may result in the issuance of an adjudication order within the meaning of Chapter 119. of the Revised Code.
- (4) The continuous, manned attendance by the operator during all times of operation of a non-solid-fuel-fired steam boiler having a fuel input rating of less than 12,500,000 BTU/hr is not required when an automated electronic control system meeting the requirements of "ASME CSD-1" referenced in rule 4101:4-3-01 of the Administrative Code is utilized, provided that all of the following requirements have also been met:
- (a) The boiler manufacturer and the installing contractor shall complete and sign a certification report (similar to the report shown in Appendix C of ASME CSD-1) for each boiler. The certification report shall meet the requirements of Section CG-510 of the ASME CSD-1 and shall identify the manufacturer, model number, and operational test date for each specific boiler control and safety device and certify that each control and safety device was installed and tested in accordance with the manufacturer's installation instructions and the ASME CSD-1.
 - (b) The installing contractor, who shall be registered in accordance with rule 4101:4-7-01 of the Administrative Code, shall obtain and provide to the owner or user the operating, testing, servicing, and cleaning instructions for the controls and safety devices. Additionally, the installing contractor shall provide to the owner or user the complete wiring and piping diagrams and a written precaution that the annual operating, testing, and servicing of the controls and safety devices is to be performed only by a qualified individual. The contractor shall obtain a receipt from the owner or user for the delivery of these instructions.
 - (c) The certification report and the receipt described in paragraphs (B)(4)(a)

and (B)(4)(b) of this rule shall be submitted to the superintendent prior to the required inspection and issuance of the certificate of operation prescribed in rule 4101:4-8-01 of the Administrative Code. Failure to submit this documentation may result in the issuance of an adjudication order within the meaning of Chapter 119. of the Revised Code.

- (d) The owner or user shall develop, coordinate, and implement a preventative maintenance program and ensure that the employee responsible for maintaining the boiler is trained, knowledgeable, and competent to operate and maintain such boiler, controls, and safety devices. The maintenance program shall be consistent with the manufacturer's recommendations and shall include regular inspections and operational testing for the boiler controls and safety devices. Annual inspection and operational testing shall be performed and documented by a qualified individual as defined in rule 4101:4-1-01 of the Administrative Code. Daily, weekly, monthly, and semi-annual inspections and operational testing, as outlined by the manufacturer and as recommended in Appendix D of the ASME CSD-1, shall be performed and documented by an employee who has been trained, is knowledgeable, and is competent to operate and maintain such boiler, controls, and safety devices. The maintenance records shall identify the manufacturer, model number, set point, the operational tests performed, the operational test date, the inspection results, and who performed the tests or inspection for each specific boiler control and safety device. The maintenance records shall be made available to the inspector for review during the certificate inspection. Failure to provide the required maintenance records may result in the issuance of an adjudication order within the meaning of Chapter 119. of the Revised Code.
- (5) The continuous, manned attendance by the operator during all times of operation of a non-solid-fuel-fired steam boiler having a fuel input rating of greater than or equal to 12,500,000 BTU/hr and meeting the requirements of "NFPA 85" referenced in rule 4101:4-3-01 is not required when an automated electronic control system is utilized meeting the requirements of the ASME CSD-1 referenced in rule 4101:4-3-01 of the Administrative Code, provided that all of the following requirements have also been met:
- (a) The certification report, wiring diagrams, instructions, maintenance, and testing requirements for the control system outlined in paragraphs (B)(4)(a) to (B)(4)(d) of this rule shall apply.
- (b) Prior to installation of the boiler(s), the owner shall submit a detailed, written, process hazard analysis (PHA) to the superintendent of industrial compliance that identifies and evaluates the hazards associated with the unattended operation of the boiler and justifies the method(s) proposed to address the hazards. The analysis shall identify

possible incident scenarios, the proposed protection/solution for each scenario, and any such additional information as determined necessary by the superintendent. The PHA shall be reviewed by the owner, updated at least every five years, and submitted to the superintendent for review and filing. Failure to provide the required PHA may result in the issuance of an adjudication order within the meaning of Chapter 119. of the Revised Code.

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CERTIFIED ELECTRONICALLY

Certification

11/20/2014

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