

Proposed Rules
of
Tennessee Department of Labor and Workforce Development
Division of Boiler and Elevator Inspection
Board of Boiler Rules

Chapter 0800-3-3
Boiler Inspections

Presented herein are proposed amendments of the Department of Labor and Workforce Development, Division of Boiler and Elevator Inspection, Board of Boiler Rules, submitted pursuant to T.C.A. § 4-5-202 in lieu of a rulemaking hearing. It is the intent of the Department of Labor and Workforce Development to promulgate these amendments without a rulemaking hearing unless a petition requesting such hearing is filed within thirty (30) days of the publication date of the issue of the Tennessee Administrative Register in which the proposed amendments are published. Such petition to be effective must be filed in the Legal Division of the Department of Labor and Workforce Development, Andrew Johnson Tower, 2nd Floor, 710 James Robertson Parkway, Nashville, Tennessee 37243, and in the Administrative Procedures Division of the Department of State, William R. Snodgrass Tennessee Tower, 8th Floor, 312 8th Avenue North, Nashville, Tennessee, 37243-0310, and must be signed by twenty-five (25) persons who will be affected by the amendments, or submitted by a municipality which will be affected by the amendments, or an association of twenty-five (25) or more members, or any standing committee of the General Assembly.

For a copy of the proposed amendments, contact Mr. Gary W. Cookston, Director, Division of Boiler and Elevator Inspection, Tennessee Department of Labor and Workforce Development, Andrew Johnson Tower, 3rd Floor, 710 James Robertson Parkway, Nashville, Tennessee 37243-0663, telephone: (615) 532-1929.

The text of the proposed amendments is as follows:

Amendments

Paragraph (18) of Rule 0800-3-3-.01 Definitions is amended by deleting that language entirely and substituting the following language, so that as amended the rule shall read:

- (18) “Historic power boilers” means any steam traction engine, portable or stationary, standard or nonstandard power boiler, including free-lance and scale models, owned by publicly operated museums, non-profit organizations and individuals who preserve, maintain, exhibit and only occasionally operate these boilers on a not-for-profit basis and for the primary purpose of perpetuating the agricultural and pioneer heritage of Tennessee.
- (a) This definition shall be interpreted to include the following two types of historic boilers:
1. Traditional: Any steam traction engine, portable or stationary, standard or nonstandard power boiler that was constructed prior to July 1, 1949.
 2. Nontraditional: Any free-lance and scale models, standard or nonstandard power boiler that was constructed after July 1, 1949.
 - (i) Free-lance is any nontraditional historic power boiler built without original drawings, calculations or blueprints.
 - (ii) Scale model is any nontraditional historic power boiler built as an exact or scale replica of a traditional historic power boiler.

Authority: T.C.A. §§ 68-122-101, 68-122-102 and 68-122-104.

Parts 1 and 2 of Subparagraph (a) of Paragraph (1) and Subparagraph (b) of Paragraph (1) of Rule 0800-3-3-.05 Existing Power Boilers are amended by deleting that language entirely and substituting the following language, so that as amended the rule shall read:

- (1) Age Limits.
 - (a) There shall be an age limit of 30 years for any nonstandard existing power boiler, except for the following:
 1. Any such boiler not having a lap-riveted longitudinal joint may be continued in operation for so long as no distress or leakage develops during a pressure test with water temperature between 60° to 120° F, of no more than 90% of the set pressure of the lowest setting pressure relief device on the boiler, held for a period of at least thirty (30) minutes.
 2. Any such boiler having lap-riveted longitudinal joints and operating at a pressure in excess of 50 psig shall have an age limit of 20 years. When removed from an existing setting, this type of boiler shall not be reinstated for a pressure in excess of 15 psig.
 3. “Historic power boilers” as defined in T.C.A. § 68-122-104(c)(1) and Rule 0800-3-3-.01(18).
 - (b) The age limit for a standard existing power boiler shall be dependent upon the results of a thorough internal and external inspection and, where required by the inspector, a pressure test with water temperature between 60° to 120° F, of no more than 90% of the set pressure of the lowest setting pressure relief device on the boiler, held for a period of at least thirty (30) minutes.

Authority: T.C.A. §§ 68-122-101, 68-122-102 and 68-122-104(c)(1).

Rule 0800-3-3-.08 Historic Boilers is amended by deleting the rule in its entirety and substituting the following language, so that as amended the rule shall read:

- (1) These rules apply to “historic power boilers” as defined in Rule 0800-3-3-.01(18).
- (2) Historic power boilers shall receive prior authorization from the Chief Inspector before entry and operation of the boiler in the state of Tennessee. Prior to entering the State with the boiler, the owner or user shall submit the proper Board approved application for operation of a historic power boiler.
 - (a) For historic power boilers located in the State, the owner or user shall be required to submit the initial application as long as he possesses a current Tennessee certificate of inspection. If the Tennessee certificate of inspection expires, the owner or user shall reapply to the Chief Inspector for permission to operate.
 - (b) For historic power boilers located outside of the State, with a valid Tennessee certificate of inspection, the owner or user is allowed to freely operate their boiler at events within the State. As long as the boiler has a valid Tennessee certificate of inspection, there is no need to reapply for permission to operate. If the Tennessee certificate of inspection remains expired for more than sixty (60) days without an inspection, or if the owner chooses to no longer operate the boiler or retain a Tennessee certificate of inspection, the boiler shall be placed in dormant status. If at any time the boiler is placed in dormant status, the owner or user shall reapply with the Chief Inspector for permission to operate.
- (3) Design and Testing.

- (a) For all traditional historic power boilers, both standard and nonstandard, and nontraditional nonstandard historic power boilers, the owner or user shall supply the Chief Inspector with reports of the maximum allowable working pressure calculations and ultrasonic testing at the time of application to operate.

The calculations and ultrasonic testing shall be completed by a knowledgeable individual familiar with the practice. All report results are subject to the acceptance of the Chief Inspector at time of application.

- (b) A copy of the manufacturer's data report shall accompany all applications to operate nontraditional standard historic power boilers in the State.
- (c) The Chief Inspector or Deputy Inspector may at anytime during the application and inspection process request additional information, such as, but not limited to, design, material, inspection or testing.

(4) Traditional Historic Power Boilers.

- (a) The maximum allowable working pressure shall be calculated with a minimum safety factor of 5 for standard, and 5.5 for traditional nonstandard historic power boilers, using the formula for historic power boilers in paragraph (14) of this rule, not to exceed 125 psig.
- (b) The minimum safety factor shall be 6.5 for traditional historic power boilers having lap-riveted longitudinal joints. The maximum allowable working pressure should not exceed 100 psig. Seal welding of a lap-riveted longitudinal joint is not permitted.

(5) Nontraditional Historic Power Boilers.

- (a) All nontraditional historic power boilers constructed after the effective date of this rule shall be constructed in accordance to Rule 0800-3-3-03(1). Nontraditional nonstandard historic power boilers, free-lance or scale models, constructed after the effective date of this rule shall not be allowed to operate in the State.
- (b) The maximum allowable working pressure for nontraditional standard historic power boilers shall be determined in accordance with the applicable provisions of the edition of the ASME Code under which they were constructed.
- (c) The maximum allowable working pressure shall be calculated with a minimum safety factor of 5.5 for nontraditional nonstandard historic power boilers, using the formula for historic power boilers in paragraph (14) of this rule, not to exceed 125 psig.
- (d) Nontraditional nonstandard historic power boilers having lap-riveted longitudinal joints shall not be allowed to operate in the State.

- (6) An annual inspection of all historic power boilers shall be conducted by a Deputy Inspector. The issuance of the annual Tennessee certificate of inspection shall be based on the results of the annual inspection.

(7) Operational Log.

- (a) The owner of a historic power boiler operating in the State shall possess a bound operational log. After successful completion of the initial inspection by a Deputy Inspector, the owner shall be provided with a registered operational log book by the Chief Inspector. The operational log shall contain, but is not limited to, the following:

1. The operation date of the historic power boiler;
 2. The length of time the historic power boiler was operated;
 3. Location where operated (city and state);
 4. Jurisdictional inspection dates with the signature and commission number of inspector;
 5. Description of repairs and alterations, including the dates, with signature and commission number of inspector;
 6. Testing performed and by whom (e.g., pressure test, ultrasonic test, radiographic test, etc.);
 7. Change of ownership, including the date the historic power boiler changed hands and to whom; and
 8. The front page of the operational log shall include a page number index of all inspections, inspector instructions, and repairs or incidents involved with the historic power boiler.
- (b) Operational logs shall be available to the inspector at all times the historic power boiler is to be operated in the State. Operational logs that are lost or misplaced shall be reported to the Chief Inspector immediately. The owner or user of the historic power boiler shall be responsible for the cost of the operational log replacement. Failure to possess or report a lost or misplaced operational log, may prevent the historic power boiler from operating in the State or revoking of the Tennessee certificate of inspection.
- (c) Whenever the pages of an operational log have been completely filled, the owner shall request a supplemental operational log from the Chief Inspector at no cost to the owner. The owner is responsible for retaining all operational logs, initial and supplemental, for the life of the historic boiler. In the event that the historic power boiler changes hands, the new owner shall receive all original operational logs, initial and supplemental, from the previous owner. The previous owner may make a copy of the operational logs for his records.
- (8) A pressure test with water temperature between 60° to 120° F, and not to exceed 90% of the set pressure of the lowest setting pressure relief device on the boiler, held for a period of at least thirty (30) minutes may be conducted at the discretion of the Deputy Inspector.
- (9) All historic power boilers shall be equipped with an ASME-stamped National Board-rated safety valve of adequate capacity, together with a water level indicator, calibrated pressure gauge and two suitable means of introducing water into the boiler.
- (10) The historic power boilers, traditional and nontraditional, shall be equipped with a fusible plug. All fusible plugs shall be constructed to meet the requirements of the ASME Code.
- (a) Fusible plugs shall be located at the lowest permissible water level as determined by the boiler manufacturer or the Chief Inspector when this information is not available.
 - (b) Fireside fusible plugs shall protrude at a minimum of one inch into the water.
 - (c) Waterside fusible plugs shall not protrude into the fire area more than one inch.
 - (d) Fusible plugs shall not be refilled.

- (e) All fusible plugs shall be removed for inspection once every two years.
 - (f) All fusible plugs shall be replaced after 300 hours of service with a new fusible plug constructed to meet the requirements of the ASME Code.
 - (g) The date when the fusible plug is removed for inspection or replaced shall be documented in the owner's operational log.
- (11) All historic power boilers shall be equipped with operational tri-cocks, a gauge glass and pressure gauge. A siphon, or water seal, shall be installed between the pressure gauge and boiler. All pressure gauges shall be proven accurate at the time of the annual inspection by testing or documentation of calibration.
- (12) Repairs and Alterations.
- (a) Any welded code repair or any alteration shall be performed by organizations holding a valid National Board "R" stamp. If the repair or alteration is performed in this State, the "R" stamp-holder shall have a current State of Tennessee Boiler Repair and Erection Contractor's license.
 - (b) Mechanical code repairs to historic power boilers such as, but not limited to, tube, rivet and stay replacement may be completed by the owner, or his designee, who is knowledgeable about the repair to be performed with prior approval of the Chief Inspector.
 - (c) All repairs and alterations, welded and mechanical, shall be inspected by an inspector and documented on the applicable National Board "NB-R" form. The "NB-R" form shall be submitted and kept on file in the Chief Inspector's office.
 1. For those repairs and alterations performed in the State, a Deputy Inspector shall perform the inspection.
 2. For repairs and alterations performed outside of the State, the inspection shall be performed by a National Board commissioned boiler inspector.
 3. All repairs and alterations shall be documented in the owner's operational log and signed by the inspector who performed the inspection.
- (13) All standard historic power boilers shall have legible stamping clearly visible to the inspector.
- (14) Maximum Allowable Working Pressure for Nonstandard Historic Power Boilers.
- (a) The maximum allowable working pressure of a historic power boiler shall be determined in accordance with the following formula:
- $$\frac{TStE}{RFS}$$
- Where:
- TS = ultimate tensile strength of shell plate, pounds per square inch (psi)
- t = minimum thickness of shell plate, in weakest course (inches)

E = efficiency of longitudinal joint (For tube ligaments and pitch, determine E by the rules provided in Section I of the ASME Code. For riveted construction, refer to the National Board Inspection Code, 1973 edition. For seamless construction, consider E to be 100%)

R = inside radius of weakest course of shell (inches)

FS = factor of safety [See subparagraph (a) of paragraph (4) and subparagraph (c) of paragraph (5) of this rule]

- (b) Tensile Strength - When the tensile strength of steel or wrought iron shell plates is not known, it shall be taken as 55,000 psi for steel and 45,000 psi for wrought iron.
- (c) Crushing Strength of Mild Steel - The resistance to crushing of mild steel shall be taken as 95,000 psi.
- (d) Strength of Rivets in Shear - When computing the ultimate strength of rivets in shear, the following values in psi of the cross-sectional area of the rivet shank shall be used:

	PSI
Iron rivets in single shear	38,000
Iron rivets in double shear	76,000
Steel rivets in single shear	44,000
Steel rivets in double shear	88,000

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 selected from Table 1, or as ascertained by cutting out one rivet in the body of the joint.

**TABLE 1
SIZES OF RIVETS 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	1-1/16	1-1/16	

- (e) The working pressure may be decreased by the inspector, with authorization of the Chief Inspector, if the condition and safety of the boiler warrant.

Authority: T.C.A. §§ 68-122-101, 68-122-102 and 68-122-104.

The proposed rules set out herein were properly filed in the Department of State on the 6th day of February, 2006, and pursuant to the instructions set out above, and in the absence of the filing of an appropriate petition calling for a rulemaking hearing, will become effective on the 28th day of June, 2006.