

UNIFORM BOILER AND PRESSURE VESSEL ACT OF NORTH CAROLINA

North Carolina General Statutes
Chapter 95, Article 7A

AND

ADMINISTRATIVE RULES

North Carolina Administrative Code
Title 13, Chapter 13

Revised as of January 2009



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Introduction

The Boiler Safety Bureau is responsible for establishing and enforcing minimum safety standards for boilers and pressure vessels, including, to the limited extent allowed by federal law, nuclear energy systems. The Boiler Safety Bureau administers, on a day-to-day basis, the laws and regulations in these areas. The 14 inspectors employed by the Bureau, with the help of approximately 200 commissioned inspectors employed by insurance companies, conducted 43,700 inspections during 2003. The North Carolina General Assembly first enacted a law instituting regulation of high-pressure boilers in 1935. Since then, coverage has expanded to include low-pressure boilers and pressure vessels. In 1975, the General Assembly enacted the Uniform Boiler and Pressure Vessel Act (Chapter 95, Article 7A of the N.C. General Statutes).

In May 1981, North Carolina adopted the Boiler and Pressure Vessel Rules that are now contained in the N.C. Administrative Code (Title 13, Chapter 13 of the N.C. Administrative Code). N.C. Gen. Stat. § 95-69.14 requires that the boiler and pressure vessel rules conform as nearly as possible to the Boiler and Pressure Vessel Code of the American Society of Mechanical Engineers (ASME Code). North Carolina has adopted the ASME Code by reference with minor exceptions as set forth herein.

This publication contains the Uniform Boiler and Pressure Vessel Act and the Administrative Rules, as amended through January 2007. It is intended to be used by owners and operators of equipment and devices covered under these laws, as well as employees of such owners and operators, in order to inform them of their rights and obligations with regard to ensuring the safe operation of such equipment and devices in North Carolina. Our experience shows that most businesses and workers want to comply with the labor laws of the State, and will generally do so when they know what the laws provide. We hope the use of this publication will help build the spirit of cooperation and fairness which currently characterizes most workplaces in North Carolina. That gives our State a more effective and productive workforce with which to maintain our competitive national economic position.

We encourage and solicit public comments concerning these laws and regulations. Please direct your comments and questions to the Boiler Safety Bureau, N.C. Department of Labor, 1101 Mail Service Center, Raleigh, North Carolina 27699-1101.

Cherie K. Berry
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January 2009

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N.C. GENERAL STATUTES

CHAPTER 95

DEPARTMENT OF LABOR AND LABOR REGULATIONS

ARTICLE 7A

UNIFORM BOILER AND PRESSURE VESSEL ACT OF NORTH CAROLINA

(Revised as of September 2007)

§ 95-69.8. Short title.

This Article shall be known as the Uniform Boiler and Pressure Vessel Act of North Carolina. (1975, c. 895, s. 1.)

§ 95-69.9. Definitions.

(a) The term "board" shall mean the North Carolina Board of Boiler and Pressure Vessel Rules.

(b) The term "boiler" shall mean a closed vessel in which water is heated, steam is generated, steam is superheated, or any combination thereof, under pressure or vacuum by the direct or indirect application of heat. The term "boiler" shall also include fired units for heating or vaporizing liquids other than water where these units are complete within themselves.

(b1) The term "Chief Inspector" shall mean the individual appointed by the Commissioner to hold the office of Chief of the Boiler Safety Bureau within the Department of Labor. The Chief Inspector serves as the North Carolina member on the National Board of Boiler and Pressure Vessel Inspectors.

(c) The term "Commissioner" shall mean the North Carolina Commissioner of Labor.

(d) Repealed by Session Laws 2005-453, s. 1, effective October 1, 2005.

(d1) The term "Deputy Inspector" shall mean any Boiler and Pressure Vessel Inspector who is employed by the Department of Labor and is subordinate to the Chief Inspector.

(e) The term "inspection certificate" or "certificate of inspection" shall mean certification by the Chief Inspector that a boiler or pressure vessel is in compliance with the rules and regulations adopted under this Article.

(f) The term "inspector's commission" shall mean a written authorization by the Commissioner for a person who has met the qualifications set out in this Article to conduct inspections of boilers and pressure vessels.

(f1) The term "National Board" shall mean the National Board of Boiler and Pressure Vessel Inspectors.

(f2) The term "person" shall mean any individual, association, partnership, firm, corporation, private organization, or the State of North Carolina or any political subdivision of the State or any unit of local government.

(g) The term "pressure vessel" shall mean a vessel in which the pressure is obtained from an indirect source or by the application of heat from an indirect source or a direct source, other than those included within the term "boiler". (1975, c. 895, s. 2; 1993, c. 351, s. 1; 2005-453, s. 1.)

§ 95-69.10. Application of Article; exemptions.

(a) This Article shall apply to all boilers and pressure vessels constructed, used, or designed for operation in this State including all new and existing installations which are operated in connection with business buildings, institutional buildings, industrial buildings, assembly buildings, educational buildings, public residential buildings, recreation buildings, other public buildings, and water supplies. This Article shall also apply to boilers and hot water supply tanks, and heaters located in hotels, motels, tourist courts, camps, cottages, resort lodges, and similar places whenever the owner or operator advertises in any manner for transit patronage, or solicits such business for temporary abode by transit patrons.

(b) This Article shall not apply to:

- (1) Boilers and pressure vessels owned or operated by the federal government, unless the agency in question has asked for coverage by this Article.
- (2) Pressure vessels used for transportation or storage of compressed gases when constructed in compliance with the specifications of the United States Department of Transportation and when charged with gas marked, maintained, and periodically requalified for use, as required by appropriate regulations of the United States Department of Transportation.
- (3) Portable pressure vessels used for agricultural purposes only or for pumping or drilling in an open field for water, gas or coal, gold, talc, or other minerals and metals.
- (4) Boilers and pressure vessels which are located in private residences or in apartment houses of less than six families.
- (5) Repealed by Session Law 2007-231, s.1.
- (6) Air tanks located on vehicles licensed under the rules and regulations of other state authorities operating under rules and regulations substantially similar to those of this State and used for carrying passengers or freight within interstate commerce.
- (7) Air tanks installed on right-of-way of railroads and used directly in the operation of trains.
- (8) Any of the following pressure vessels that do not exceed the listed limitations if the vessel is not equipped with a quick actuating closure:
 - a. Five cubic feet in volume and 250 psig.
 - b. Three cubic feet in volume and 350 psig.
 - c. One and one-half cubic feet in volume and 600 psig.
 - d. An inside diameter of six inches with no limitation on pressure.
- (9) Pressure vessels operating at a working pressure not exceeding 15 psig.
- (10) Pressure vessels with a nominal water capacity not exceeding 120 gallons and containing water under pressure at temperatures not exceeding 120° F, including those containing air, the compression of which serves as a cushion.

- (11) Boilers and pressure vessels on railroad steam locomotives that are subject to federal railway safety regulations pursuant to 49 C.F.R. § 230.
- (12) Repealed by Session Laws 1985, c. 620, s. 2.
- (13) Coil-type hot water supply boilers, generally referred to as steam jennies, where the water can flash into steam when released directly to the atmosphere through a manually operated nozzle and where adequate safety relief valves and controls are installed on them, provided none of the following limitations are exceeded:
 - a. There is no drum, header, or other steam space.
 - b. No steam is generated within the coil.
 - c. Maximum 1 inch tube size.
 - d. Maximum $\frac{3}{4}$ inch nominal pipe size.
 - e. Maximum 6 gallon nominal water storage capacity.
 - f. Water temperature of 350°F.
- (14) Pressure vessels containing water at a temperature not exceeding 110 degrees fahrenheit except that this provision shall not exclude hydropneumatic pressure vessels from regulation.
- (15) An air tank that does not exceed eight cubic feet in volume that is installed on a service vehicle.
- (16) Autoclaves in medical offices and hospitals that are less than five cubic feet in volume, even if they are equipped with a quick actuating closure.
- (17) Coil-type hot water supply boilers of the instantaneous type where adequate safety relief valves and controls are installed if none of the following limitations are exceeded:
 - a. There is no drum, header, or other steam space.
 - b. No steam is generated within the coil.
 - c. Maximum one-inch tube size.
 - d. Maximum three-quarter-inch nominal pipe size.
 - e. Maximum six-gallon nominal water storage capacity.
 - f. Water temperature not to exceed 250°F.
 - g. Maximum heat input does not exceed 400,000 Btu/hr or 110 kW.
 - h. Maximum pressure of 260 psig.
- (18) Toy boilers, if all of the following apply:
 - a. The water containing volume of the boiler is less than one quart.
 - b. The operating pressure does not exceed 15 psig.
 - c. The maximum outside diameter of the shell is no greater than six inches.
 - d. The boiler is manually fired by solid fuels.
- (19) Pressure vessels associated with electrical apparatus in electrical switchyards if the pressure vessels have proper pressure relief devices.
- (20) Carbon dioxide tanks used in beverage dispensing service.

(c) The construction and inspection requirements established by the Department of Labor shall not apply to hot water supply boilers which are directly fired with oil, gas or electricity, or hot water supply tanks heated by steam or any other indirect means, which do not exceed any of the following limitations:

- (1) Heat input of 200,000 Btu/hr or 58.6 kW.
- (2) Repealed by Session Laws 2005-453, s. 2.
- (3) Nominal water capacity of 120 gallons.

provided that they are equipped with ASME Code and National Board certified safety relief valves.

(d) The construction requirements established by the Department of Labor shall not apply to pressure vessels installed in this State prior to December 31, 1981, that:

- (1) Are of one-piece, unwelded, forged construction;
- (2) Are constructed before January 1, 1981, and operating or could be operated, under the laws of any state or Canadian Province that has adopted one or more sections of the ASME Code;
- (3) Are transferred into this State without a change of ownership; and
- (4) Are determined by the Chief Inspector to be constructed under standards substantially equivalent to those established by the department at the time of transfer;

provided that they are equipped with ASME Code and National Board certified safety relief valves.

(e) The construction requirements established by the Department of Labor shall not apply to pressure vessels installed in this State prior to December 31, 1984, that:

- (1) Are manufactured from gray iron casting material, as specified by the American Society for Testing and Materials, (ASTM) 48-60T/30;
- (2) Are constructed before December 31, 1967, and operating or could be operated, under the laws of any state or Canadian Province that has adopted one or more sections of the ASME Boiler and Pressure Vessel Code;
- (3) Are transferred into this State without a change of ownership; and
- (4) Are determined by the Chief Inspector to be constructed under standards substantially equivalent to those established by the department at the time of transfer;

provided that they are equipped with ASME Code and National Board certified safety relief valves.

(f) The construction requirements established by the Department of Labor shall not apply to hydropneumatic tanks installed or operated by a community water system prior to January 1, 1986.

(g) The inspection requirements established by the Department of Labor shall not apply to pressure vessels used for transportation or storage of liquefied petroleum gas that are subject to inspection in accordance with the requirements established by the Department of Agriculture and Consumer Services. (1975, c. 895, s. 3; 1979, c. 920, ss. 1, 2;

1981, c. 591; 1983, c. 654; 1985, c. 620, ss. 1, 2, c. 629; 1993, c. 351, s. 2; 2005-453, s. 2.; 2007-231, s. 1.)

§ 95-69.11. Powers and duties of Commissioner.

The Commissioner of Labor is hereby charged, directed, and empowered:

- (1) To adopt, modify, or revoke rules governing the construction, operation, and use of boilers and pressure vessels, including, where necessary, requirements for fencing to prevent unauthorized persons from coming in contact with boilers and pressure vessels or the systems they are connected to.
- (2) To delegate to the Chief Inspector any powers, duties, and responsibilities that the Commissioner determines will best serve the public interest in the safe operation of boilers and pressure vessels, and to supervise the Chief Inspector in the performance of those duties.
- (3) To enforce rules adopted under authority of this Article.
- (4) To inspect boilers and pressure vessels covered under this Article.
- (5) To issue inspection certificates to those boilers and pressure vessels found in compliance with this Article.
- (6) To enjoin violations of this Article in the civil and criminal courts of this State.
- (7) To keep adequate records of the type, dimensions, age, conditions, pressure allowed upon, location, and date of the last inspection of all boilers and pressure vessels to which this Article applies.
- (8) To require such periodic reports from inspectors, owners, and operators of boilers and pressure vessels as he deems appropriate in carrying out the purposes of this Article.
- (9) To have free access, without notice, to any location in this State, during reasonable hours, where a boiler or pressure vessel is being built, installed, or operated for the purpose of ascertaining whether such boiler or pressure vessel is built, installed, or operated in accordance with the provisions of this Article.
- (10) To investigate serious accidents involving boilers and pressure vessels to determine the causes of the accidents, and to have full subpoena powers in conducting the investigation.
- (11) To establish reasonable fees for the inspection and issuance of inspection certificates for boilers and pressure vessels that are in use.
- (12) To establish reasonable fees for the examination and certification of inspectors.
- (13) To appoint qualified individuals to the Board of Boiler and Pressure Vessel Rules.
- (14) To perform inspections and audits relating to the construction and repair of boilers and pressure vessels and to establish and collect fees for these activities.
- (15) To order the payment of civil penalties provided by this section.
- (16) To require that before any boiler or pressure vessel that is subject to this Article is transferred into the State, or is moved from one location to another within the State, the owner or the owner's authorized agent shall file with the Commissioner a written notice of intent to do so and the type of device

involved and provide a copy of the specifications, previous inspection documents, or other information that the Commissioner deems necessary to determine whether the boiler or pressure vessel is in compliance with the provisions of this Article and the rules adopted under this Article. (1975, c. 895, s. 4; 1985, c. 620, s. 3; 1993, c. 351, s. 3; 2005-453, s. 3.)

§ 95-69.12. Boiler Safety Bureau established.

There is established a Boiler Safety Bureau within the Department of Labor. The Commissioner shall appoint a Chief Inspector of the Boiler Safety Bureau and any other employees that the Commissioner deems necessary to assist the Chief Inspector in administering the provisions of this Article and the rules adopted under this Article. (1975, c. 895, s. 5; 1981 (Reg. Sess., 1982), c. 1187, ss. 2, 3; 2005-453, s. 4.)

§ 95-69.13. Board of Boiler and Pressure Vessels Rules created; appointment, terms, compensation and duties.

(a) There is hereby created the North Carolina Board of Boiler and Pressure Vessels Rules consisting of nine members appointed by the Commissioner for a term of five years each. Of these nine appointed members, one shall be a representative of the owners and users of steam boilers within this State, one a representative of boiler manufacturers within this State, one a representative of boilermakers within this State who has had not less than five years' practical experience as a boilermaker, one shall be a representative of the owners or users of pressure vessels within the State, one shall be a representative of the pressure vessel manufacturers within the State, one a representative of boiler inspection and insurance companies authorized to insure boilers and pressure vessels within the State, one a representative of the antique boiler owners and operators in this State, one a contractor holding a Group I North Carolina Heating License, and one a mechanical engineer on the faculty of a recognized engineering college or a licensed professional engineer having boiler and pressure vessel experience. The Commissioner of Labor shall serve as chair. The Chief Inspector shall serve on the Board and in the absence of the Commissioner shall serve as chair.

(b) The Board shall meet at least twice annually and shall be responsible for:

- (1) Studying and proposing rules and regulations, for adoption, modification or revocation by the Commissioner, governing the construction, installation, inspection, repair, alteration, use and operation of boilers and pressure vessels in this State. The rules and regulations so formulated shall conform as nearly as possible to the standards of the American Society of Mechanical Engineers.
- (2) Devise and proctor examinations covering this Article and the rules adopted under this Article to applicants seeking a commission as inspectors of boilers and pressure vessels in this State.
 - (2a) Act as proctors during the administration of the National Board commissioning examination.
- (3) Issue, suspend, or revoke inspector's commissions as inspectors of boilers and pressure vessels within this State. Whenever action is taken under this section to suspend or revoke a commission, the affected party shall be given notice of the availability of an administrative hearing and of judicial review in accordance with Chapter 150B of the General Statutes, the Administrative Procedure Act.

(c) The members of the Board shall serve without salary but shall be paid a subsistence and travel allowance as established in accordance with Chapter 138 of the General Statutes. (1975, c. 895, s. 6; 1977, c. 788; 1981 (Reg. Sess., 1982), c. 1187, s. 4; 1983, c. 717, s. 16; 1985, c. 620, s. 5; 2005-453, s. 5.)

§ 95-69.14. Rules and regulations governing the construction, operation and use of boilers and pressure vessels.

The Commissioner, after consultation with the Board, may adopt, modify, or revoke any rules and regulations governing the construction, installation, repair, alteration, inspection, use, and operation of boilers and pressure vessels as the Commissioner deems appropriate to insure the safe operation and avoidance of injury to person or property from boilers and pressure vessels. The rules and regulations will conform as nearly as possible to the standards of the American Society of Mechanical Engineers and the amendments and interpretations of those engineering standards.

The procedure for the adoption, modification, or revocation of the rules and regulations shall be in accordance with Chapter 150B of the General Statutes, the Administrative Procedure Act. (1975, c. 895, s. 7; 1985, c. 620, s. 4; 1987, c. 827, s. 1; 2005-453, s. 6.)

§ 95-69.15. Classification of inspectors; qualifications; examinations; inspector's commission.

(a) There shall be three types of inspectors authorized to conduct inspections and report their findings to the Chief Inspector under this Article:

- (1) Boiler and Pressure Vessel Inspector or Deputy Inspector. – Shall be a qualified individual, employed by the Department of Labor and appointed by the Commissioner, to assist in conducting inspections under this Article and report on the suitability of boilers and pressure vessels so inspected.
- (2) Special Inspector or Insurance Inspector. – Shall be a qualified individual regularly employed by an insurance company authorized to insure in this State against injury to person or property or both from explosions and accidents involving boilers and pressure vessels. Special Inspectors shall not include employees of private contract inspection agencies.
- (3) Owner-User Inspectors. – Shall be a qualified individual employed on a full-time basis by a company operating pressure vessels for its own use and not for resale, and maintains an established inspection program for periodic inspection of pressure vessels owned or used by that company and where such inspection program is under the supervision of one or more engineers having qualifications satisfactory to the Commissioner.

(b) Inspector's Commission. – Any company authorized to insure in this State against loss to person or property as a result of an explosion or accident involving boilers and pressure vessels or operating boilers or pressure vessels or both for its own use and not for resale, may apply for the issuance of an inspector's commission for an individual within its employ who has a commission from the National Board.

A North Carolina commission authorizes an inspector to make inspections on boilers and pressure vessels and report on the suitability of said boilers and pressure vessels to the Chief Inspector. Those inspectors holding commissions as special inspectors shall be limited to making inspections on boilers and pressure vessels insured by their employer. Owner-user inspectors

shall be limited to conducting inspections on boilers and pressure vessels operated by their respective employers.

A person seeking a commission from this State to conduct in-service inspections of boilers and pressure vessels must take and pass an examination on this Article and the rules adopted pursuant to this Article prior to receiving the commission. Any person who has had a commission in this State but who has been inactive for more than one year must take or retake and pass the State examination before conducting further in-service inspections of boilers and pressure vessels. (1975, c. 895, s. 8; 2005-453, s. 7; 2007-231, s. 2.)

§ 95-69.16. Inspection certificate required.

All boilers and pressure vessels subject to the provisions of this Article shall be inspected by a commissioned inspector. The Commissioner may determine both the frequency and the method of inspection. In determining the frequency of inspection, the Commissioner shall give due consideration to the hazard involved and the need for the protection of the public. The method of inspection must provide an adequate procedure to insure the safety of individuals likely to be injured by an explosion or accident involving a boiler or pressure vessel.

No boiler or pressure vessel may be operated without an inspection certificate, except pressure vessels being operated under an owner-user provision where administrative procedures of equal safety and competency have been approved by the Board and Commissioner. No more than 60 days grace period may be granted beyond the certificate expiration date. (1975, c. 895, s. 9; 1993, c. 351, s. 4; 2005-453, s. 8; 2007-231, s.3.)

§ 95-69.17. Noncomplying devices; appeal.

(a) If the Commissioner determines that a boiler or pressure vessel is subject to the provisions of this Article and that the operation of the boiler or pressure vessel is exposing the public to an unsafe condition likely to result in serious personal injury or property damage, the Commissioner may immediately order in writing that the use of the boiler or pressure vessel be stopped or limited until the Commissioner determines that the boiler or pressure vessel has been made safe for operation.

(b) If the Commissioner determines that the provisions of this Article or the rules adopted pursuant to this Article have not been complied with, the Commissioner may refuse to issue or renew or may revoke, suspend, or amend an inspection certificate.

(c) Whenever action is taken under this section, the affected party shall be given notice of the availability of an administrative hearing and of judicial review in accordance with Chapter 150B of the General Statutes, the Administrative Procedure Act. (1975, c. 895, s. 10; 1987, c. 827, s. 263; 1993, c. 351, s. 5; 2005-453, s. 9.)

§ 95-69.18. Operation without inspection certificate; operation not in compliance with this Article; operation after nonissuance or revocation of certificate.

(a) No person may operate or permit to be operated any boiler or pressure vessel subject to the provisions of this Article without a valid inspection certificate unless the absence of a valid inspection certificate is the result of the Commissioner's failure to inspect the device.

(b) No person may operate or permit to be operated any boiler or pressure vessel subject to the provisions of this Article other than in accordance with this Article and the rules adopted pursuant to this Article.

(c) No person may operate or permit to be operated any boiler or pressure vessel subject to the provisions of this Article after the Commissioner has refused to issue or has revoked the inspection certificate for the boiler or pressure vessel. (1975, c. 895, s. 11; 1993, c. 539, s. 665; 1994, Ex. Sess., c. 24, s. 14(c) ; 2005-453, s. 10.)

§ 95-69.19. Violations; civil penalties; appeals.

(a) Any person who violates G.S. 95-69.18(a) or (b) (operation without inspection certificate; operation not in accordance with Article or rules and regulations) shall be subject to a civil penalty not to exceed two hundred fifty dollars (\$250.00) for each day each boiler or pressure vessel is so operated or used.

(b) Any person who violates G.S. 95-69.18(c) (operation after refusal to issue or after revocation of inspection certificate) shall be subject to a civil penalty not to exceed five hundred dollars (\$500.00) for each day any such boiler or pressure vessel is so operated or used.

(c) In determining the amount of any penalty ordered under authority of this section, the Commissioner shall give due consideration to the appropriateness of the penalty with respect to the size of the business of the person being charged, the gravity of the violation, the good faith of the person, and the record of previous violations.

(d) The determination of the amount of the penalty by the Commissioner shall be final, unless within 15 days after receipt of notice thereof by certified mail with return receipt, by signature confirmation as provided by the U.S. Postal Service, by a designated delivery service authorized pursuant to 26 U.S.C. § 7502(f)(2) with delivery receipt, or via hand delivery, the person charged with the violation takes exception to the determination in which event the final determination of the penalty shall be made in an administrative proceeding and in a judicial proceeding pursuant to Chapter 150B of the General Statutes, the Administrative Procedure Act.

(e) The Commissioner may file in the office of the clerk of the superior court of the county where the violation occurred or where the person against whom a civil penalty has been ordered resides, or if a corporation is involved in the county where the corporation maintains its principal place of business, a certified copy of a final order of the Commissioner unappealed from, or of a final order of the Commissioner affirmed upon appeal. Upon filing of the final order, the clerk of superior court shall enter judgment in accordance with the order and notify the parties. The judgment shall have the same force and effect as a judgment by the superior court of the General Court of Justice. (2005-453, s. 11; 2007-231, s. 6.)

§ 95-69.20. Violations; criminal penalties.

(a) Any person who knowingly and willfully misrepresents himself as an authorized inspector administering or enforcing the provisions of this Article or the rules adopted pursuant to this Article shall be guilty of a Class 2 misdemeanor.

(b) Any person knowingly making a material and false statement, representation, or certification in any application, record, report, plan, or any other document filed or required to be maintained pursuant to this Article or the rules adopted pursuant to this Article shall be guilty of a Class 2 misdemeanor. (2005-453, s. 12.)

N.C. ADMINISTRATIVE CODE
TITLE 13
DEPARTMENT OF LABOR
CHAPTER 13
BOILER AND PRESSURE VESSEL

SECTION .0100 - DEFINITIONS

CHAPTER 13 - BOILER AND PRESSURE VESSEL

SECTION .0100 – DEFINITIONS

13 NCAC 13 .0101 DEFINITIONS

The following definitions apply throughout the rules in this Chapter, and shall be construed as controlling in case of any conflict with the definitions contained in any other standard or code:

- (1) "Accepted Design and Construction Code" means the Boiler and Pressure Vessel Code of the American Society of Mechanical Engineers (ASME Code), or a comparable code with standards that the Chief Inspector determines to be as safe as the ASME Code.
- (2) "Appurtenance" means any control, fitting, appliance or device attached to or working in conjunction with the boiler proper or pressure vessel.
- (3) "ASME Code" means the Boiler and Pressure Vessel Code of the American Society of Mechanical Engineers.
- (4) "Audit" means activities, other than those identified as certificate inspections, conducted by the Chief Inspector or his designee. These activities include, in part:
 - (a) reviews and surveys for ASME and National Board stamp issuance and renewal;
 - (b) audits conducted on an authorized inspector at the location of a manufacturer or repair organization as may be required by the ASME Code, National Board Inspection Code, or National Board Rules for Commissioned Inspectors; and
 - (c) audits pursuant to evaluation for the issuance of North Carolina Specials.
- (5) "Automatically fired boiler" means a boiler that cycles automatically in response to a control system and which does not require a constant attendant for the purpose of introducing fuel into the combustion chamber or to control electrical input.
- (6) "Authorized Inspection Agency" means an organization employing commissioned inspectors including the following:
 - (a) the Department of Labor, Boiler Safety Bureau;
 - (b) an inspection agency of an insurance company licensed to write boiler and pressure vessel insurance; or
 - (c) an owner-user inspection agency that meets the requirements of G.S. 95-69.15.

- (7) "Authorized inspector" means an employee of an Authorized Inspection Agency who is commissioned by the National Board and this State, holds an appropriate endorsement on his/her National Board Commission, and inspects as the third party inspector in ASME Code manufacturing facilities.
- (8) "Boiler", as defined in G.S. 95-69.9(b), includes the following types of boilers:
- (a) "Exhibition boiler" means a historical or antique boiler which generates steam or hot water for the purposes of entertaining or educating the public or is used for demonstrations, tourist travel or exhibitions. This term includes steam tractors, threshers, steam powered sawmills, and similar usages.
 - (b) "High pressure boiler" means a boiler in which steam or other vapor is generated at a pressure of more than 15 psig, or water is heated to a temperature greater than 250°F and a pressure greater than 160 psig for use external to itself. High pressure boilers include the following:
 - (i) Electric boilers.
 - (ii) Miniature boilers.
 - (iii) High temperature water boilers.
 - (iv) High temperature liquid boilers (other than water).
 - (c) "Low pressure boiler" means a boiler in which steam or other vapor is generated at a pressure of not more than 15 psig, or water is heated to a temperature not greater than 250°F and a pressure not greater than 160 psig, including the following:
 - (i) "Hot water heating boiler" means a low pressure boiler that supplies heated water that is returned to the boiler from a piping system and is used normally for building heat applications (hydronic boiler).
 - (ii) "Hot water supply boiler" means a low pressure boiler that furnishes hot water to be used externally to itself (domestic water boiler).
 - (iii) "Steam heating boiler" means a low pressure boiler that generates steam to be used normally for building heat applications.
 - (d) "Model hobby boiler" means a boiler which generates steam, whether stationary or mobile, where the boiler does not exceed 20 square feet heating surface, a shell diameter of 16 inches, a volume of 5 cubic feet and a pressure not exceeding 150 psig and is used for the purpose of entertainment or exhibiting steam technology.
 - (e) "Water heater" means a closed vessel in which water is heated by the combustion of fuel, by electricity, or by any other source and withdrawn for potable use external to the system at pressures not exceeding 160 psig and temperatures not exceeding 210°F.
- (9) "Boiler blowoff" means that system associated with the rapid draining of boiler water to remove concentrated solids which have accumulated as a natural result of steam generation. This term also applies to the blowoff for other boiler appurtenances, such as the low-water fuel cutoff.
- (10) "Boiler proper or pressure vessel" means the internal mechanism, shell, and heads of a boiler or pressure vessel terminating at:

- (a) the first circumferential joint for welded end connections;
 - (b) the face of the first flange in bolted flange connections; or
 - (c) the first threaded joint in threaded connections.
- (11) "Bureau" means the Boiler Safety Bureau of the North Carolina Department of Labor.
- (12) "Certificate inspection" means an inspection, the report of which is used by the Chief Inspector as justification for issuing, withholding or revoking the inspection certificate. The term certificate inspection also applies to the external inspection conducted in accordance with this Chapter whether or not a certificate is intended to be issued as a result of the inspection.
- (13) "Certificate of competency" means the certificate issued by the Commissioner to a person who has passed the National Board inspectors examination.
- (14) "Condemned boiler or pressure vessel" means a boiler or pressure vessel:
- (a) that has been found not to comply with G.S. Chapter 95, Article 7A, or this Chapter;
 - (b) that constitutes a menace to public safety; and
 - (c) that cannot be repaired or altered so as to comply with G.S. Chapter 95, Article 7A, and this Chapter.
- (15) "Coil type watertube boiler" means a boiler having no steam space, such as a steam drum, whereby the heat transfer portion of the water containing space consists only of a coil of pipe or tubing.
- (16) "Commissioned inspector" means an employee of an Authorized Inspection Agency that is commissioned by the National Board and the State of North Carolina and who is charged with conducting in-service inspections of pressure equipment and inspecting repairs or alterations to that equipment.
- (17) "Design criteria" means accepted design and construction code requirements relating to the mode of design and construction of a boiler or pressure vessel.
- (18) "External inspection" means an inspection of the external surfaces and appurtenances of a boiler or pressure vessel. An external inspection may entail the "shutting down" of a boiler or pressure vessel while it is in operation, including inspection of internal surfaces, if the inspector determines this action is warranted.
- (19) "Hydropneumatic storage tank" means a pressure vessel used for storage of water at ambient temperature not to exceed 120°F and where a cushion of air is contained within the vessel.
- (20) "Imminent danger" means any condition or practice in any location that a boiler or pressure vessel is being operated which is such that a danger exists, and which could reasonably be expected to cause death or serious physical harm immediately if the condition is not abated.
- (21) "Insurance inspector" means the special inspector employed by an insurance company, and holding a valid North Carolina Commission and National Board Commission.
- (22) "Internal inspection" means as complete an examination as can reasonably be made of the internal and external surfaces and appurtenances of a boiler or pressure vessel while it is shut down.

- (23) "Maximum allowable working pressure (MAWP)" means the maximum gauge pressure as determined by employing the stress values, design rules and dimensions designated by the accepted design and construction code or as determined by the Chief Inspector in accordance with this Chapter.
- (24) "Menace to public safety" means a boiler or pressure vessel that cannot be operated without a risk of injury to persons and property.
- (25) "Miniature boiler" means a boiler which does not exceed any of the following:
 - (a) 16 inch inside shell diameter;
 - (b) 20 square feet of heating surface (does not apply to electrically fired boilers);
 - (c) 5 cubic feet volume; and
 - (d) 100 psig maximum allowable working pressure.
- (26) "National Board Commission" means the commission issued by the National Board to those individuals who have passed the National Board commissioning examination and have otherwise fulfilled the requirements of the National Board Rules for Commissioned Inspectors.
- (27) "National Board Inspection Code (NBIC)" means the ANSI/NB-23 standard published by the National Board, as adopted by the Bureau.
- (28) "Nonstandard boiler or pressure vessel" means:
 - (a) high pressure boilers contracted for or installed before December 7, 1935;
 - (b) heating boilers contracted for or installed before January 1, 1951;
 - (c) pressure vessels contracted for or installed before January 1, 1976;
 - (d) hydropneumatic storage tanks contracted for or installed before January 1, 1986; and
 - (e) boilers or pressure vessels for which the ASME Code is not intended to apply, other than those boilers and pressure vessels to which the term North Carolina Special applies.
- (29) "Normal working hours" means between the hours of 6:00 AM and 6:00 PM, Monday through Friday, except for state recognized holidays established in 25 NCAC 01E.0901.
- (30) "North Carolina Commission" means the commission issued by the Board, to holders of a National Board Commission, authorizing them to conduct inspections in this State.
- (31) "North Carolina Special" means a boiler or pressure vessel that is not constructed under the accepted design and construction code and for which the owner/operator must apply for a special inspection certificate with the Chief Inspector.
- (32) "NPS" means nominal pipe size.
- (33) "Nuclear component" means the items in a nuclear power plant such as pressure vessels, piping systems, pumps, valves, and component supports.
- (34) "Nuclear system" means a system comprised of nuclear components which collectively serve the purpose of producing and controlling an output of thermal energy from nuclear fuel and includes those associated systems essential to the function and overall safety of the power system.

- (35) "Operating pressure" means the pressure at which a boiler or pressure vessel operates. It shall not exceed the MAWP except as shown in Section I of the ASME Code for forced flow steam generators.
- (36) "Owner or user" means any person or legal entity responsible for the operation of any boiler or pressure vessel installed in this State. This term also applies to a contractor, installer, or agent of the owner or user, as applicable.
- (37) "Owner-user inspector" means an individual who holds a valid North Carolina Commission and National Board Commission and is employed by a company operating pressure vessels for its own use and not for resale, and maintains an inspection program that meets the requirements of the National Board for periodic inspection of pressure vessels owned or used by that company.
- (38) "Pressure piping" means piping including welded piping, external to high pressure boilers from the boiler proper to the required valve(s).
- (39) "Pressure relief devices" mean the devices on boilers and pressure vessels set to open and relieve the pressure in the event of an over pressurization event, and include the following:
 - (a) "Non-reclosing pressure relief device" means a pressure relief device designed to remain open after operation and includes a rupture disk which is a non-reclosing pressure relief device actuated by static pressure upstream of the device and designed to function by the bursting of a pressure retaining disk.
 - (b) "Pressure relief valve" means a pressure relief device that is designed to reclose and prevent the further flow of fluid after normal conditions have been restored. These devices include:
 - (i) "Relief valve" means an automatic pressure relief valve that is actuated by static pressure upstream of the valve which opens further with the increase in pressure over the opening pressure.
 - (ii) "Safety relief valve" means an automatic pressure relief valve that is actuated by static pressure upstream of the valve and characterized by full opening pop action or by opening in proportion to the increase in pressure over the opening pressure.
 - (iii) "Safety valve" means an automatic pressure relief valve that is actuated by static pressure upstream of the valve and characterized by full opening pop action.
- (40) "PSIG" means pounds per square inch gauge.
- (41) "Reinspection or Follow-Up Inspection" means as complete an examination as is necessary to verify that any repair or corrective action required as a result of a certificate inspection is completed.
- (42) "Service vehicle" means a vehicle mounted with an air storage tank and often with other storage tanks that have oil, grease or other fluids. The purpose of the vehicle is to service vehicles and equipment in the field away from the owners shop.
- (43) "Shop inspection" means an inspection conducted by an Authorized Inspector pursuant to an inspection service agreement whereby the fabrication process or the repair or alteration of a boiler or pressure vessel is observed to ensure compliance with ASME and the National Board.

- (44) "Special inspection" means any inspection conducted by a Deputy Inspector other than a regularly scheduled inspection. Special inspection also includes the performance of an inspection by a Deputy Inspector which requires that the inspector make a special trip to meet the needs of the individual or organization requesting the inspection, including conducting certificate inspections during hours other than normal working hours, and inspection of field repairs and alterations.
- (45) "Special inspector" means a National Board commissioned inspector employed by an insurance company authorized to write boiler and pressure vessel insurance in the state of North Carolina.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Temporary Amendment [(16)]; Eff. March 10, 1982, for a Period of 120 Days to
Expire on July 8, 1982;
Amended Eff. January 1, 2009; July 1, 2006; January 1, 1995; January 1, 1987;
January 1, 1986; June 1, 1982.*

13 NCAC 13 .0102 CONTROLLING DEFINITIONS

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Repealed Eff. July 1, 2006.*

13 NCAC 13 .0103 INCORPORATED - STANDARDS

The following standards are incorporated by reference, including subsequent amendments and editions of the standards. The rules of this Chapter shall control when any conflict between these Rules and the following standards exists.

- (1) The ANSI/NB-23 National Board Inspection Code (NBIC). Copies of the ANSI/NB-23 National Board Inspection Code are available for inspection at the offices of the Bureau and may also be obtained from the National Board of Boiler and Pressure Vessel Inspectors, via U.S. Mail at 1055 Crupper Avenue, Columbus, Ohio 43299, via telephone at (614) 888-8320, or via the internet at www.nationalboard.org. The cost is one-hundred and fifty dollars (\$150.00) per copy.
- (2) The American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. Copies of the complete set of the ASME Code are available for inspection at the offices of the Bureau and may also be obtained from the American Society of Mechanical Engineers, via U.S. Mail at 22 Law Drive, Box 2300, Fairfield, New Jersey 07007-2300, via telephone at (800) 843-2763, or via the internet at www.asme.org. The cost is ten-thousand nine-hundred dollars (\$10,900.00) per set.
- (3) The North Carolina State Building Code. Copies of the North Carolina State Building Code are available for inspection at the offices of the Bureau and may also be obtained from the North Carolina Department of Insurance, Office of the State Fire Marshall, Engineering Division, Codebook Section, via U.S. Mail at

322 Chapanoke Road, Suite 200, Raleigh, North Carolina 27603, via telephone at (919) 661-5880, or via the internet at www.ncdoi.com/OSFM/. The cost is fifty dollars (\$50.00) per copy.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. January 1, 1995;
Amended Eff. July 1, 2006.*

SECTION .0200 - ADMINISTRATION

13 NCAC 13 .0201 NAME: ADDRESS

(a) The Boiler Safety Bureau, which administers the provisions of Article 7A of G.S. Chapter 95, is located in Raleigh at the following physical address:

N.C. Department of Labor
Boiler Safety Bureau
Old Revenue Building
111 Hillsborough Street
Raleigh, North Carolina 27603.

(b) All correspondence shall be addressed to the following mailing address:

North Carolina Department of Labor
Boiler Safety Bureau
1101 Mail Service Center
Raleigh, North Carolina 27699-1101
Telephone (919) 807-2760
Fax (919) 807-2762.

*History Note: Authority G.S. 95-69.12;
Eff. May 29, 1981;
Amended Eff. July 1, 2006; January 1, 1995; June 1, 1992.*

13 NCAC 13 .0202 INSPECTOR QUALIFICATION

(a) Deputy Inspectors conducting certificate inspections shall be in possession of a valid North Carolina Commission. Special Inspectors and Owner-User Inspectors shall be in possession of a National Board Commission and a North Carolina Commission.

(b) A North Carolina Commission shall be issued to an inspector who has passed an examination administered by the Chief Inspector on the Uniform Boiler and Pressure Vessel Act and the rules of this Chapter. There is no fee for this examination.

(c) If an inspector's North Carolina Commission becomes inactive for more than one calendar year, or if the inspector does not conduct at least one inspection in North Carolina per calendar year, the inspector must retake and pass this examination before becoming active again in this state.

(d) National Board examinations are administered on the first Wednesday and Thursday of March, June, September and December. Applicants for the examination shall contact the Chief Inspector by the 10th of the month prior to the month in which they desire to sit for the examination.

(e) The National Board examination covers the construction, installation, operation, maintenance and repair of boilers and pressure vessels and their appurtenances, and is administered upon payment to the Department of Labor of a fee of one hundred dollars (\$100.00). Unsuccessful Applicants who desire to retake the National Board examination must pay an additional one hundred dollar (\$100.00) fee before retaking the examination.

(f) A grade of 70 percent or greater must be attained to achieve a passing grade on both examinations.

History Note: Authority G.S. 95-69.11; 95-69.15;

Eff. May 29, 1981;

Amended Eff. January 1, 2009; July 1, 2006; January 1, 1995; September 1, 1986.

13 NCAC 13 .0203 NORTH CAROLINA COMMISSION

(a) When requested by the employer, a North Carolina Commission, bearing the signature of the Commissioner, shall be issued by the Board to persons holding a valid National Board Commission who have taken and passed the examination specified in 13 NCAC 13 .0202(b).

(b) Requests for a North Carolina Commission shall be processed upon proof of a National Board Commission and payment of a twenty five dollar (\$25.00) fee to the Department of Labor.

(c) North Carolina Commissions are valid through December 31, at which time the inspector's employer shall submit a renewal application and a twenty five dollar (\$25.00) fee to the Department of Labor.

(d) The North Carolina Commission shall be returned by the employing company with notification of termination date to the Bureau within 30 days of termination of employment.

(e) A North Carolina Commission may be suspended or revoked by the Board in accordance with G.S. 95-69.13 for incompetence, untrustworthiness or falsification of any statement in an application or inspection report. The Board shall give notice of the commencement of proceedings for suspension or revocation of a commission pursuant to G.S. 150B-23. A North Carolina Commission may be suspended prior to the hearing if the Chief Inspector determines that the public health, safety or welfare requires this action. In this case, the proceedings shall be promptly commenced and determined in accordance with G.S. 150B-3. The Board's decision regarding the competency of an inspector shall be determined after consideration of the knowledge, skill, and care ordinarily possessed and employed by boiler and pressure vessel inspection personnel in good standing. Industry custom and practice shall be considered but are not determinative. Failure to conduct the inspections in accordance with this Chapter shall constitute incompetence. The inspector shall be given the opportunity to show that he is conducting his duties in a competent manner and that suspension or revocation is unwarranted. If the inspector believes that the decision of the Board is not warranted, he may file a petition for judicial review pursuant to Article 4 of Chapter 150B of the N.C. General Statutes.

History Note: Authority G.S. 95-69.11; 95-69.15;

Eff. May 29, 1981;

Amended Eff. January 1, 2009; July 1, 2006; January 1, 1995; March 2, 1992; September 1, 1986.

13 NCAC 13 .0204 CONFLICT OF INTEREST

An inspector shall not engage in any conduct or endeavor that would constitute a conflict of interest including the following:

- (1) Ownership or employment in any kind of boiler or pressure vessel sales or service business;
- (2) Ownership or employment in any kind of boiler or pressure vessel parts or appurtenances sales or service business;
- (3) Consultative services for accepted design and construction codes or National Board quality program design or implementation; or
- (4) Inspection services outside the purview of the employing entity.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. January 1, 2009; July 1, 2006; January 1, 1995.*

13 NCAC 13 .0205 OWNER-USER INSPECTION AGENCY

(a) A company seeking to conduct inspections of its own pressure vessels shall file an application with the Chief Inspector and obtain approval from the Board.

(b) The company shall, in its application, designate a supervisor who shall be an engineer within its employ, who, upon approval of the application, shall:

- (1) ascertain that the company's inspectors, pursuant to Rules .0202 and .0203 of this Section are issued owner-user commission cards;
- (2) supervise inspections of pressure vessels and see that an inspection report, signed by the owner-user inspector, is filed at the equipment site;
- (3) notify the Chief Inspector of any unsafe pressure vessel which presents a condition of imminent danger;
- (4) maintain a master file of inspection records which shall be made available for examination by the Chief Inspector or his representative during business hours:
 - (A) identifying each pressure vessel by serial number and abbreviated description; and
 - (B) showing the date of the last and next scheduled inspection;
- (5) on a date mutually agreed upon with the Chief Inspector, file an annual statement signed by the supervisor, showing the number of boilers and certifying that each inspection was conducted pursuant to this Chapter, accompanied by an administrative fee of twenty dollars (\$20.00) per vessel.

(c) Inspection certificates are not required for pressure vessels inspected under an owner-user program.

*History Note: Authority G.S. 95-69.11; 95-69.15; 95-69.16;
Eff. May 29, 1981;
Amended Eff. January 1, 2009; July 1, 2006; January 1, 1995; March 2, 1992;
September 1, 1986.*

13 NCAC 13 .0206 OWNERS OR USERS TO NOTIFY CHIEF INSPECTOR OF ACCIDENTS

(a) The owner or user of a boiler or pressure vessel shall notify the Chief Inspector within 24 hours when a device is rendered inoperative due to an over pressurization, dry firing or any

related event that causes damage to the equipment, real or personal property, personal injury, or death.

(b) No person shall remove or disturb the boiler, pressure vessel, or any of its parts, before an investigation by the Chief Inspector or designee has been made, except for the purpose of conserving life or limiting consequential damages.

(c) Insurance inspectors who elect to investigate an accident shall not have equipment removed from the location until an investigation has been made by the Chief Inspector or designee.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. January 1, 2009; July 1, 2006; January 1, 1995.*

13 NCAC 13 .0207 INSPECTION REPORTS

(a) Inspectors shall file inspection reports with the Chief Inspector:

- (1) within 10 working days after each certificate inspection; and
- (2) immediately for all conditions of imminent danger, or any condition that would result in the insurance company's refusal to issue or continue an insurance policy on the boiler or pressure vessel.

(b) Inspectors shall notify the Chief Inspector, in person or by electronic means, upon becoming aware of an accident which renders a boiler or pressure vessel inoperative or causes damage to property, personal injury, or death.

(c) Should the inspector, during the course of making an inspection, find a condition of imminent danger, he shall immediately notify the Chief Inspector, in person or by electronic means, so that steps might be taken to remove the device from service.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. July 1, 2006; January 1, 1995.*

13 NCAC 13 .0208 INSURANCE COMPANIES TO NOTIFY CHIEF INSPECTOR

(a) All insurance companies shall notify the Chief Inspector within 30 days regarding actions taken on all boiler or pressure vessel risks, including:

- (1) the issuance of a policy;
- (2) the cancellation of a policy;
- (3) the non-renewal or suspension of a policy because of unsafe conditions; or
- (4) removal of a boiler or pressure vessel from service.

(b) Such notification shall be made by using the National Board form NB-4, or a form determined by the Chief Inspector to be equivalent to the National Board form, and include reference to the following:

- (1) Object, date of service and effective date;
- (2) Owner's number;
- (3) Jurisdiction number;
- (4) National Board number;
- (5) Name of manufacturer;
- (6) Name of owner including county;
- (7) Location of object including county;

- (8) User of object;
- (9) Date of last inspection for certificate;
- (10) Whether or not a certificate of inspection was issued; and
- (11) Reason for discontinuance or cancellation.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. January 1, 2009; July 1, 2006; January 1, 1995.*

13 NCAC 13 .0209 INSTALLERS TO NOTIFY CHIEF INSPECTOR

Any company or individual installing boilers or pressure vessels subject to inspection in accordance with this Chapter shall notify the Chief Inspector and request a certificate inspection not less than 10 working days prior to placing equipment in operation. Equipment shall not be operated prior to an inspection being conducted that finds the boiler or pressure vessel to be in compliance with this Chapter.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. July 1, 2006; January 1, 1995.*

13 NCAC 13 .0210 SHOP INSPECTIONS AND NATIONAL BOARD R STAMP QUALIFICATION REVIEWS

(a) Shop Inspections.

- (1) Manufacturers or repair firms seeking to employ the Boiler Safety Bureau to act as their Authorized Inspection Agency pursuant to the ASME Code or National Board Inspection Code, shall enter into a written agreement with the North Carolina Department of Labor, Boiler Safety Bureau for this purpose.
- (2) An audit of the Deputy Inspector serving as the Authorized Inspector pursuant to Subparagraph (a)(1), of this Rule, and the contracting company in which he/she is working shall be conducted on an annual basis for non-nuclear companies and twice each year for nuclear companies. The contracting company is required to pay the audit fees required in Rule .0213 of this Section.

(b) National Board R Stamp Qualification Reviews

- (1) The Chief Inspector or his designee shall conduct the qualification reviews for issuance of the National Board R symbol stamp pursuant to the National Board Inspection Code as adopted, except as provided in Subparagraph (b)(2) of this Rule.
- (2) The Chief Inspector or his designee shall not conduct the qualification reviews of those companies for which the Boiler Safety Bureau provides inspection services, or those companies which specifically request the review be conducted by the National Board.
- (3) A review to be conducted by the Boiler Safety Bureau shall be scheduled upon receipt of request by the National Board. A deposit of twelve hundred dollars (\$1,200.00) shall be made by the applying company to cover the fees and expenses incurred and shall be received by the Boiler Safety Bureau no less than 30 days prior to the subject review. This deposit will be applied to the cost of the

review. Payment of the fee as required in Rule .0213 of this Section shall be the responsibility of the company being reviewed. Should an applicant not be successful in obtaining accreditation, the applicable deposit shall be paid before a new review is conducted.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. October 1, 2008; July 1, 2006; January 1, 1995.*

13 NCAC 13 .0211 CERTIFICATE INSPECTIONS

- (a) A commissioned inspector shall inspect all boilers and pressure vessels at the time of installation and at regular intervals thereafter, as provided in this Rule.
- (b) Subject to the exceptions in Paragraphs (c) and (d) of this Rule, and after seven days notice is given to the owner or user, an inspector shall conduct an internal inspection of a high pressure boiler at the time of installation and annually thereafter. Three to nine months after the internal inspection, an external inspection shall be conducted while the boiler is in operation. The inspector shall ensure that the safety controls are operating as required. Issuance of the inspection certificate shall be based on the results of the internal inspection; however, if the inspector determines during the external inspection that an unsafe condition exists that is likely to result in serious personal injury or property damage, the certificate of operation may be revoked or suspended until such time as the device has been made safe for operation.
- (c) In place of the first internal inspection of a new high pressure boiler, an inspector may conduct an external inspection if the inspector determines that data sufficient to determine compliance with the rules of this Chapter can be gathered from an external inspection. This shall not apply to relocated used boilers.
- (d) Miniature boilers, coil-type watertube boilers, and boilers heating a fluid other than water which do not produce steam or vapor operating as high pressure boilers shall undergo an external inspection annually. Miniature boilers, coil-type watertube boilers and boilers heating a fluid other than water operating as heating boilers shall undergo an external inspection biennially. Hobby boilers, locomotive boilers and exhibition boilers shall be inspected annually, at the beginning of the season when they are anticipated to be operated.
- (e) Heating boilers and pressure vessels, except hydropneumatic storage tanks, shall undergo an external inspection biennially.
- (f) Owner-user inspectors shall conduct inspections for pressure vessels as prescribed in this Rule.
- (g) Inspectors may order coverings removed, internal inspections, external inspections, control and safety device testing or calibration, or pressure tests whenever conditions warrant further evaluation of the pressure equipment.
- (h) Hydropneumatic storage tanks shall undergo an external inspection every four years.
- (i) When the inspector or Chief Inspector determines that a certificate cannot be issued as a result of an inspection, the boiler or pressure vessel shall be reinspected after the necessary repairs are made.
- (j) Inspections shall be conducted in accordance with the National Board Inspection Code. The inspector may require controls and safety devices to be disassembled, tested, checked or calibrated as necessary to ensure their proper operation.

(k) The Chief Inspector may extend an existing inspection certificate for a high pressure boiler for a period not exceeding 90 days beyond the certificate expiration date, should an inspection at the specified period result in undue hardship for the owner or user. The owner or user shall submit a written request to extend an existing inspection certificate, providing justification for an extension. The request shall include a report from a commissioned inspector of an external inspection which shall have been conducted no earlier than 60 days before the certificate expiration date, and the inspection report shall include a recommendation from the inspector for an extension to the inspection certificate.

(l) The inspection frequency established by this Rule may be modified by the Chief Inspector for individual boilers and pressure vessels if the Chief Inspector determines that due to unique conditions, the frequency established herein is not appropriate, and that the safety attained by the normal inspection frequency will be otherwise obtained.

*History Note: Authority G.S. 95-69.11; 95-69.14; 95-69.17;
Eff. May 29, 1981;
Amended Eff. July 1, 2006; January 1, 1995; March 2, 1992.*

13 NCAC 13 .0212 PREPARATION FOR INSPECTION

(a) The owner or user shall prepare a high pressure boiler, including locomotive, hobby and exhibition boilers, for internal inspection by:

- (1) cooling the boiler, furnace, and setting so as to prevent damage to any part;
- (2) draining and washing thoroughly internal parts to be inspected, including disassembly and cleaning of float bowl type low-water fuel cutoff devices and associated piping plugs or caps;
- (3) removing wash-out, drain, and inspection plugs;
- (4) removing enough of the grates in an internally fired boiler to permit inspection;
- (5) removing enough brickwork, refractory, and insulation to permit inspection;
- (6) removing manhole and handhole plates;
- (7) preparing the controls and safety devices for inspection and testing;
- (8) preventing leakage of water, steam, or vapors into boiler interiors that would endanger personnel;
- (9) providing adequate ventilation to prevent the accumulation of hazardous gasses; and
- (10) providing, when requested by the inspector, a competent person, as defined under the North Carolina Occupational Safety & Health standard for confined spaces, to assist the inspector in the performance of his inspection.

(b) In addition to the requirements in Paragraph (a) of this Rule, the owner or user shall prepare a high pressure boiler that has a manhole and which is connected to a common header with another boiler for internal inspection by:

- (1) closing and tagging, or padlocking, the steam stop valves and opening all drain valves or cocks located between the steam stop valves;
- (2) closing and tagging, or padlocking, the feed and check valves and opening all drain valves or cocks located between the feed and check valves;
- (3) draining boiler and then closing and padlocking the blowoff valves;
- (4) disconnecting, at the request of the inspector, blowoff lines between pressure parts and valves;

- (5) opening all drains and vent lines;
- (6) closing and tagging or padlocking all fuel valves, blower or fan motors and any other devices that may deliver energy in any form to the boiler; and
- (7) after complying with all other provisions of this Rule, removing the manhole covers.

(c) The owner or user need not make any special preparation for an external inspection of a boiler or pressure vessel, except that if the inspector requires the boiler or pressure vessel to be shut down for a closer inspection, the boiler or pressure vessel shall be prepared as is required for the internal inspection of a high pressure boiler.

*History Note: Authority G.S. 95-69.11;
 Eff. May 29, 1981;
 Amended Eff. July 1, 2006; January 1, 1995.*

13 NCAC 13 .0213 CERTIFICATE AND INSPECTION FEES

(a) A thirty dollar (\$30.00) certificate and processing fee for each boiler or pressure vessel inspected by an Insurance Inspector and found to be in compliance with the rules in this Chapter shall be paid to the North Carolina Department of Labor.

(b) An inspection and certificate fee shall be paid to the North Carolina Department of Labor for each boiler or pressure vessel inspected by a Deputy Inspector as follows:

Boilers - An inspection of a boiler where the heating surface is:		Inspection
Internal Inspection		
Less than 500 sq. ft.	\$45.00	\$80.00
500 or more sq. ft. but less than 5000 sq. ft.	\$110.00	
\$225.00		
5000 or more sq. ft.	\$300.00	
\$500.00		
Cast iron boilers	\$45.00	\$75.00
Locomotive boilers (Antique Exhibition/Show)	N/A	\$75.00
Exhibition boilers (Antique Exhibition/Show)	N/A	\$45.00
Hobby boilers	N/A	\$30.00
Pressure Vessels - An inspection of a pressure vessel, other than a heat exchanger, where the product of measurement in feet of the diameter or width, multiplied by its length is:		Inspection
Internal Inspection	External	
Less than 20	\$35.00	\$40.00
20 or more but less than 50	\$45.00	\$55.00
50 or more but less than 70	\$75.00	
\$125.00		
70 or more	\$125.00	\$180.00
Heat Exchangers - An inspection of a heat exchanger, where the heating surface is:		External Inspection
Less than 500 sq. ft.	\$45.00	
500 or more sq. ft. but less than 1000 sq. ft.	\$55.00	
1000 or more sq. ft. but less than 2000 sq. ft.	\$85.00	

2000 or more sq. ft. but less than 3000 sq. ft.	\$125.00
3000	\$175.00

(c) In addition to the base fees established herein, a fee of eighty five dollars (\$85.00) per hour, including travel time, plus each expense allowed by 138-6 and 138-7 and the standards and criteria established thereto by the Director of the Budget, at the applicable state rate shall be paid to the North Carolina Department of Labor for each special inspection as defined by 13 NCAC 13 .0101(43) and for all inspections performed outside of normal working hours as defined by 13 NCAC 13 .0101(31).

(d) A fee of three hundred dollars (\$300.00) per one-half day (four hours) or any part of one-half day or five hundred dollars (\$500.00) for one day (four to eight hours) plus, in either case, each expense allowed by 138-6 and 138-7 and the standards and criteria established thereto by the Director of the Budget, at the applicable state rate shall be paid to the North Carolina Department of Labor for each shop inspection as defined by 13 NCAC 13 .0101(42).

(e) A fee of three hundred fifty dollars (\$350.00) per one-half day (four hours) or any part of one-half day or five hundred sixty dollars (\$560.00) for one day (four to eight hours), plus, in either case, each expense allowed by 138-6 and 138-7 and the standards and criteria established thereto by the Director of the Budget, at the applicable state rate shall be paid to the North Carolina Department of Labor for each nuclear inspection.

(f) A fee of four hundred dollars (\$400.00) per one-half day (four hours) or any part of one-half day or six hundred forty dollars (\$640.00) for one day (four to eight hours), plus, in either case, each expense allowed by 138-6 and 138-7 and the standards and criteria established thereto by the Director of the Budget, at the applicable state rate shall be paid to the North Carolina Department of Labor for audits.

(g) Fees for regularly scheduled inspections and audits conducted by the Chief Inspector or a Deputy Inspector outside of normal working hours or that exceed eight hours per inspection visit shall include an additional fifty dollar (\$50.00) fee per hour in addition to the normal inspection or audit fee.

(h) Printed information derived from the database for boilers and pressure vessels maintained by the Division, is available for public scrutiny. Charges for providing this service shall be payable upon receipt of invoice to the North Carolina Department of Labor. Charges for this service are as follows:

- (1) Requests for database information for which the Division has created the information selection criteria and printout format for its own use, and which can be furnished without the need for special programming will be furnished to the requester at the actual cost of reproducing the record.
- (2) Requests for database information which requires special selection criteria or printout format, and which requires the need for special programming services to derive the requested information or format, will be furnished for seventy-five dollars (\$75.00) plus twenty-five cents (\$0.25) per page.

(i) Copies of inspection reports or other inspection records may be provided upon written request to the requester at the actual cost of reproducing the record.

History Note: Authority G.S. 95-69.11;

Eff. May 29, 1981;

Amended Eff. January 1, 1995; March 2, 1992; September 1, 1986;

Temporary Amendment Eff. March 11, 1997;
Temporary Amendment Eff. March 11, 1997 expired on December 27, 1997;
Temporary Amendment Eff. December 10, 1997;
Amended Eff. July 1, 2006; March 1, 2006; August 1, 1998.

SECTION .0300 - ENFORCEMENT OF STANDARDS

13 NCAC 13 .0301 INSPECTION DOCUMENTATION

- (a) The inspector shall document the results of the inspection on a written inspection report or in an electronic format recognized by the Chief Inspector.
- (b) If the inspector finds that the boiler or pressure vessel is in compliance with the rules in this Chapter, he shall indicate on the report that the boiler or pressure vessel is satisfactory.
- (c) If the inspector finds the boiler or pressure vessel is not in compliance with the rules in this Chapter, he shall specify on the inspection report the deficiencies and the required repairs or corrective action.
- (d) The inspector shall determine if the deficiency is such that operation of the boiler or pressure vessel creates a condition of imminent danger. If a condition of imminent danger exists, the inspector shall state on the inspection report that operation of the boiler or pressure vessel is to cease until completion of the necessary repairs or corrective action. The inspector shall notify the Chief Inspector upon discovery of any condition of imminent danger.
- (e) If the condition of the boiler or pressure vessel is such that repairs or corrective action cannot bring the boiler or pressure vessel into compliance, the inspector shall recommend to the Chief Inspector that the boiler or pressure vessel be condemned from further use.
- (f) For inspections revealing deficiencies, the inspector shall provide a copy of the inspection report to the owner/user which details the violation and corrective action required.
- (g) The Bureau shall issue an invoice to the owner or user for the inspections made and for issuance of the inspection certificate. The owner or user shall remit payment as indicated on the invoice within 30 days to the North Carolina Department of Labor.

History Note: Authority G.S. 95-69.11; 95-69.16;
Eff. May 29, 1981;
Amended Eff. January 1, 2009; July 1, 2006; January 1, 1995; August 1, 1988.

13 NCAC 13 .0302 CERTIFICATE ISSUANCE

- (a) The Chief Inspector shall issue an inspection certificate to the owner/user, upon receipt of payment, when the boiler or pressure vessel is found to be in compliance with this Chapter.
- (b) The owner shall post the inspection certificate under protective cover in a prominent place visible to the operator while reading the pressure, or if a pressure gauge is not required to be installed, while observing operation of the boiler or pressure vessel, unless environmental conditions or proprietary reasons make it impracticable. The certificate shall be maintained in a readily retrievable location if the conditions make it impracticable to post.
- (c) If the Chief Inspector determines that a boiler or pressure vessel is exposing the public to an unsafe condition likely to result in serious personal injury or property damage, the Chief Inspector may refuse to issue or renew or may revoke, suspend or amend an inspection certificate; provided, however, that whenever any action is taken under this Paragraph, the

affected party shall be given notice of the availability of an administrative hearing and of judicial review in accordance with Chapter 150B of the N.C. General Statutes.

History Note: Authority G.S. 95-69.11; 95-69.17;

Eff. May 29, 1981;

Amended Eff. January 1, 2009; July 1, 2006; January 1, 1995.

13 NCAC 13 .0303 INSPECTIONS REVEALING DEFICIENCIES

(a) The owner or user shall complete any required repairs or corrective action and request an additional inspection within 60 days of the inspection, except in cases where the boiler or pressure vessel is removed from service, in which case the owner or user shall send in written confirmation, signed by the owner or user, that use of the boiler or pressure vessel has been discontinued and that the boiler or pressure vessel has been removed from the source of energy.

(b) Upon notification by the inspector of a boiler or pressure vessel for which continued operation creates a condition of imminent danger, the Chief Inspector shall determine if the recommendations of the inspector are valid, and if so, he shall notify the owner or user by the most expedient means possible, followed by written notification within 15 days stating that the use of the boiler or pressure vessel shall be discontinued immediately.

(c) The owner or user may continue operation of the boiler or pressure vessel, including those boilers or pressure vessels which are condemned, during the 60 day period, except that this provision shall not apply to boilers and pressure vessels after verbal notification by the Chief Inspector to the owner or user that a condition of imminent danger exists.

(d) After completion of any required repairs or corrective action, the boiler or pressure vessel shall be reinspected to the extent necessary to verify satisfactory completion of the required repairs or corrective action.

(e) For each reinspection or follow-up inspection conducted by Deputy Inspectors, a fee of thirty-five dollars (\$35.00) shall be paid to the North Carolina Department of Labor.

History Note: Authority G.S. 95-69.11;

Eff. May 29, 1981;

Amended Eff. July 1, 2006; January 1, 1995.

13 NCAC 13 .0304 APPEALS

(a) If the owner or user believes that the recommendations of the inspector are not warranted, he may request a review by the Chief Inspector within 15 days of the inspection. The Chief Inspector shall notify the owner or user of his decision in writing within 15 days of receipt of a request for a decision.

(b) If the owner or user believes that the decision of the Chief Inspector is not warranted he may file for a contested case hearing pursuant to Article 3 of Chapter 150B of the N.C. General Statutes.

(c) After verbal notification from the Chief Inspector that a condition of imminent danger exists, the owner or user shall not operate the boiler or pressure vessel, however, the owner or user may file for a contested case hearing pursuant to Article 3 of Chapter 150B of the N.C. General Statutes.

*History Note: Authority G.S. 95-69.11; 95-69.17;
Eff. May 29, 1981;
Amended Eff. July 1, 2006; January 1, 1995.*

13 NCAC 13 .0305 MENACE TO PUBLIC SAFETY NOTICE

(a) The Chief Inspector or his designee may post a menace to public safety notice on the boiler or pressure vessel:

- (1) if the owner or user fails to request a reinspection within 60 days of an inspection during which deficiencies were noted;
- (2) upon verbal notification by the Chief Inspector regarding an inspection whereby the inspector identified a condition of imminent danger; or
- (3) within 15 days after the Chief Inspector renders a decision regarding an appealed decision.

(b) The notice described in this Rule shall be posted on the boiler or pressure vessel and in the establishment where the boiler or pressure vessel is being used so that it may be easily read by members of the public and employees.

(c) The menace to public safety notice shall not be removed, rendered illegible or inaccessible, or otherwise obliterated except with the approval of the Chief Inspector.

(d) The Chief Inspector shall notify the Commissioner of Labor regarding action pursuant to G.S. 95-69.19.

*History Note: Authority G.S. 95-69.11; 95-69.17;
Eff. January 1, 1995;
Amended Eff. July 1, 2006.*

13 NCAC 13 .0306 VIOLATIONS

(a) Any person or legal entity operating a boiler or pressure vessel:

- (1) without an inspection certificate;
- (2) after the inspection certificate has expired;
- (3) while the inspection certificate is suspended;
- (4) after the inspection certificate has been revoked and the boiler or pressure vessel has been condemned; or
- (5) in excess of the maximum allowable working pressure as stated on the inspection certificate, or outside of the design pressure or temperature of the boiler or pressure vessel,

shall be subject to action as described in this Rule.

(b) Action to be taken by the Chief Inspector may include any or a combination of the following actions:

- (1) injunctive proceedings instituted by the Commissioner pursuant to G.S. 95-69.11; or
- (2) civil penalties issued by the Commissioner pursuant to G.S. 95-69.19.

*History Note: Authority G.S. 95-69.11; 95-69.14; 95-69.18;
Eff. May 29, 1981;
Recodified from 13 NCAC 13 .0305 Eff. January 1, 1995;
Amended Eff. July 1, 2006; January 1, 1995.*

SECTION .0400 - GENERAL REQUIREMENTS

13 NCAC 13 .0401 DESIGN AND CONSTRUCTION STANDARDS

- (a) The design, construction, installation, inspection, stamping, and operation of all boilers and pressure vessels shall conform to the rules in this Chapter and the accepted design and construction code.
- (b) Repairs and alterations to boilers and pressure vessels shall conform to the requirements of the National Board Inspection Code.
- (c) The rules of this Chapter shall control when any conflict is found to exist between the Rules and the accepted design and construction code or the National Board Inspection Code.
- (d) Welded repairs and alterations may be made only by an individual or organization in possession of a valid certificate of authorization for use of the National Board "R" symbol stamp.
- (e) Repairs of safety valves or safety relief valves shall be made by an individual or organization in possession of a valid certificate of authorization for use of the National Board "VR" symbol stamp.

*History Note: Authority G.S. 95-69.11; 95-69.13; 95-69.14;
Eff. May 29, 1981;
Amended Eff. January 1, 2009; July 1, 2006; January 1, 1995; February 1, 1989;
February 1, 1985; June 1, 1982.*

13 NCAC 13 .0402 NORTH CAROLINA STAMPING AND REGISTRATION

- (a) Boilers and pressure vessels shall be registered with the National Board and shall bear the National Board stamping as follows:
 - (1) high pressure boilers installed after November 2, 1946;
 - (2) heating boilers (except cast iron boilers) installed after January 1, 1976;
 - (3) pressure vessels installed after January 1, 1979; and
 - (4) hydropneumatic storage tanks installed after January 1, 1986.
- (b) Boilers and pressure vessels may be exempted from the requirement for National Board registration provided the owner or user submits a letter requesting a variance to the Chief Inspector giving reason for the request. The requestor shall enclose with the letter a copy of the original manufacturer's data report. The documentation shall be reviewed by the Chief Inspector to determine if the information is complete and traceable to the boiler or pressure vessel. The owner or user shall be advised of the Chief Inspector's decision within 30 working days with regard to the approval or disapproval of the request.
- (c) Electric boilers shall be listed with a qualified testing laboratory recognized by the Occupational Safety and Health Administration as a nationally recognized testing laboratory (NRTL) pursuant to 29 CFR 1910.7.
- (d) The owner or user shall, upon request of the inspector, provide a manufacturer's data report for the boiler or pressure vessel.
- (e) When a new boiler or pressure vessel is installed, or when an existing installation receives its first certificate inspection, a Deputy Inspector shall conduct the first inspection and apply a metal tag embossed or stamped with the North Carolina identification number (e.g., NC000) to the boiler or pressure vessel on or adjacent to the manufacturer's nameplate or stamping. If the

boiler or pressure vessel is constructed of materials having adequate thickness to allow stamping, the identification number may be stamped onto the boiler or pressure vessel.

(f) The owner or user shall keep all required stamping exposed at all times unless a clearly marked removable cover is installed so that it may be readily accessible at any time.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. July 1, 2006; January 1, 1995; February 1, 1989; November 1, 1986.*

13 NCAC 13 .0403 MAXIMUM ALLOWABLE WORKING PRESSURE

- (a) An inspector may lower the maximum allowable working pressure of any boiler or pressure vessel because of age, condition or the circumstances under which it is operated.
- (b) The inspector shall justify the reduction in the maximum allowable working pressure and note the new maximum allowable working pressure on the inspection report.
- (c) No boiler or pressure vessel may be operated in excess of the maximum allowable working pressure as stated on the inspection certificate or outside of the temperature ranges for which the boiler or pressure vessel was designed.
- (d) If a boiler or pressure vessel has its maximum allowable working pressure reduced under this chapter, the owner or user may appeal the inspector's decision to the Chief Inspector in accordance with the requirements of 13 NCAC 13 .0304.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. January 1, 2009; January 1, 1995.*

13 NCAC 13 .0404 CONTROLS AND SAFETY DEVICES

Boilers and pressure vessels shall be equipped with all suitable controls and safety devices required for safe operation of the equipment. Controls and safety devices shown in Table-0404 in this Rule are considered minimum requirements for the various types of boilers and pressure vessels listed. All devices required in this Rule and shown in Table-0404 are suitable for the maximum allowable operating pressure and temperature of the boiler or pressure vessel on which they are installed. The design, construction, installation, and operational requirements for controls and safety devices are as required in Rules .0405 through .0420 of this Section.

TABLE-0404

REQUIRED DEVICE AND REFERENCED RULE	HIGH PRESSURE BOILER	STEAM HEATING BOILER	HOT WATER HEATING BOILER	HOT WATER SUPPLY BOILER	WATER HEATER	PRESSURE VESSEL
Pressure Relief Device .0405	X	X	X	X	X	X
High Limit Control .0406	X	X	X	X	X	X
Pressure Gauge .0407	X	X	X	X		X

Steam Syphon (steam boilers only) .0407	X	X				
Water Column & Gauge Glass (steam boilers only) .0408	X	X				
Low-Water Fuel Cutoff (If input > 400,000 Btu) .0409	X	X	X	X		
Temperature Gauge .0410			X	X	X	
Bottom Blowoff Valves .0411	X	X				
Drain Valves .0411	X	X	X	X	X	X
Make-up Water Stop Valve(s) .0411	X	X	X	X	X	
Expansion Tank .0412			X	X	X	
Flame Failure Control .0420	X	X	X	X		

*History Note: Authority G.S. 95-69.11; 95-69.14;
 Eff. January 1, 1995;
 Amended Eff. January 1, 2009; July 1, 2006.*

13 NCAC 13 .0405 PRESSURE RELIEF DEVICES

- (a) Boilers and pressure vessels shall be protected from overpressurization by a pressure relief device. All pressure relief devices installed on any boiler or pressure vessel shall be constructed and stamped in accordance with the accepted design and construction code.
- (b) All pressure relief devices shall be stamped and capacity certified by the manufacturer indicating compliance with the National Board. The stamping shall include the set pressure (that pressure at which the valve is set to open) and the relieving capacity (the rate of flow).
- (c) High pressure boilers with over 500 square feet of heating surface and electrically fired boilers having an input in excess of 1100 kW shall be provided with a minimum of two safety valves. For high pressure boilers with a combined bare tube and extended water-heating surface area exceeding 500 square feet, one safety valve is required if the design steam generating capacity of the boiler is less than 4,000 pounds of steam per hour.
- (d) Safety valves and safety relief valves for heating boilers shall have a seat diameter of not less than ½ inch, and not more than 4 ½ inches.
- (e) Pressure relief devices shall have a set pressure and relieving capacity in accordance with the accepted design and construction code requirements for the type equipment on which the pressure relief device is installed. At least one pressure relief device shall have the set pressure set at not greater than the maximum allowable working pressure of the boiler or pressure vessel. The relieving capacity shall not be less than the minimum required relieving capacity indicated on the manufacturer's name plate or stamping, or as otherwise required by the accepted design and construction code. Safety relief valves installed on water heaters shall be of the combination temperature and pressure relieving type.

(f) All safety valves installed on high pressure boilers shall be installed on top of the boiler, or in the case of watertube boilers on top of the upper drum, with the spindle in the vertical position. All safety valves and safety relief valves installed on heating boilers shall be on top of the boiler or on an opening at the highest practicable part of the side of the boiler, but in no case shall the safety valve be installed below the normal operating level for a steam boiler. Safety valves and safety relief valves installed on hot water heating boilers, hot water supply boilers, and steam heating boilers shall be installed with the spindles mounted in the vertical position. Safety relief valves for water heaters may be installed with the spindles mounted in either the vertical or horizontal position. In no case may pressure relief devices be mounted on appurtenances.

(g) The distance between the pressure relief device outlet nozzle on the boiler and the pressure relief device inlet shall be kept to a minimum consistent with the size of the pressure relief device and the pipe sizes required. In no case shall any valves or stops be installed in the inlet piping to the pressure relief device or in the discharge piping from the pressure relief device. The boiler outlet and the piping between the boiler outlet and the pressure relief device shall have a cross sectional area of not less than the cross sectional area of the pressure relief device inlet.

(h) Discharge piping from the pressure relief device outlet shall be the same size, or larger, than the outlet pipe connection on the pressure relief device and shall be extended full size to a safe location. A safe location shall be interpreted to mean a location within six inches of the finished floor of the mechanical room, to a location outside the building terminating a safe distance above the building roof or to a location outside the building within six inches above the finished grade. For vessels such as organic fluid heaters where the medium presents a hazard, the discharge shall be to a containment vessel large enough to hold all anticipated pressure relief discharges. When pressure relief device discharge piping is routed vertically, piped drainage shall be provided by the use of drip pan elbows installed on the outlet of each pressure relief device served.

(i) Multiple pressure relief devices may be piped to the point of discharge using a common discharge header pipe. The header pipe size shall have a diameter sufficient to provide an equivalent cross-sectional area equal to or larger than the sum of the cross-sectional areas of the pressure relief device outlets to which it is connected.

(j) Pressure relief devices on pressure vessels may be installed with the spindle in the vertical or horizontal position. The pressure relief device inlet, discharge piping, and the requirement for piping the discharge to a safe location shall be the same as noted for boilers. The requirement for discharge piping is optional for pressure vessels used to store compressed air, inert gasses, water, or other fluids no more hazardous than water.

(k) Pressure relief devices for direct fired pressure vessels and for those used as air compressor storage tanks shall be installed directly on the pressure vessel with no intervening valves. Pressure relief devices for all other pressure vessels may be installed directly on the pressure vessel or in the piping system, except as modified in this Rule. A stop valve may be installed between a pressure vessel and the pressure relief device if one of the following is satisfied:

- (1) the stop valve is normally locked in the open position, and may only be closed when there is a full time attendant stationed at the stop valve when it is in the closed position for testing purposes; or
- (2) isolating the pressure relief device from the pressure vessel by closing the stop valve also isolates the pressure vessel from the source of pressure.

(l) Pressure relief devices shall be sealed to prevent the valve from being taken apart without breaking the seal. Pressure relief devices for boilers and pressure vessels containing air, water,

or steam, shall be provided with a test lever, pull test ring or other mechanism which may be used to test the operation of the valve. Pressure relief devices which are required to be provided with a testing mechanism shall be readily accessible for testing from the work platform or other means, such as a pull chain, shall be provided so that the pressure relief device can be tested from the work platform.

(m) When a hot water supply boiler or storage vessel is heated indirectly by steam or hot water in a coil or pipe, the pressure relief device capacity shall be determined by the heating surface available for heat transfer, and the pressure relief device shall not be less than 1 inch diameter.

(n) A person shall not:

- (1) attempt to remove, tamper, alter or conduct any work on any pressure relief device while the boiler or pressure vessel is in operation, except as permitted by the accepted design and construction code or the National Board Inspection Code;
- (2) load a pressure relief device in any manner to maintain a working pressure in excess of the maximum allowable working pressure as stated on the inspection certificate;
- (3) operate any boiler or pressure vessel without the safety appliances as described in this Chapter, the accepted design and construction code, and the National Board Inspection Code;
- (4) use a pressure relief device required by this Chapter as an operating pressure control; or
- (5) remove the seal and attempt to adjust or otherwise work on a pressure relief device unless the person/company removing the seal is a authorized holder of a National Board "VR" stamp.

(o) If an owner or user can demonstrate that a pressure vessel is operating in a system of such design that the maximum allowable working pressure cannot be exceeded, the Chief Inspector shall waive the requirement for installation of a pressure relief device if the pressure vessel meets the safety requirements greater than or equal to the level of protection afforded by this Chapter and the accepted design and construction code, and does not pose a danger to persons or property.

(p) Pressure relief device piping shall be supported so that the piping is supported with no additional force being applied to the pressure relief device.

(q) Hydropneumatic storage tanks shall be provided with a relief valve of not less than ¾ inch NPS and rated in standard cubic feet per minute (SCFM). The relief valve shall be installed on top of the tank. This rule applies to any equipment installed after January 1, 2009. Preexisting installed equipment shall meet the criteria effective on January 1, 1995 and does not require a change-out of the existing relief valve unless the current relief valve becomes defective.

(r) Dead weight safety valves are prohibited from use on any boiler or pressure vessel regulated by this Chapter.

(s) When the minimum safety valve relieving capacity is not found on the data plate, the following guide may be used to determine the required safety valve capacity for steam boilers. The factor noted in the table shall be multiplied by the heating surface of the boiler to determine required safety valve relieving capacity.

Table-0405 Guide for Estimating Steaming Capacity Based on Heating Surface		
	Firetube	Watertube

	Boilers	Boilers
Boiler heating surface:		
Hand-fired	5	6
Stoker-fired	7	8
Oil, gas, or pulverized fuel	8	10
Waterwall heating surface:		
Hand-fired	8	8
Stoker-fired	10	12
Oil, gas, or pulverized fuel	14	16
Copper-finned watertube		
Hand-fired	N/A	4
Stoker-fired	N/A	5
Oil, gas, or pulverized fuel-fired	N/A	6

*History Note: Authority G.S. 95-69.11; 95-69.14;
 Eff. May 29, 1981;
 Amended Eff. June 1, 1992; February 1, 1985;
 Recodified from 13 NCAC 13 .0404 Eff. January 1, 1995;
 Amended Eff. January 1, 2009; July 1, 2006; January 1, 1995.*

13 NCAC 13 .0406 HIGH PRESSURE OR TEMPERATURE LIMIT CONTROL

(a) Each automatically fired steam boiler or system of commonly connected steam boilers shall have at least one steam pressure control that will shut off the fuel supply to each boiler or system of commonly connected boilers when the pressure reaches a preset maximum operating pressure. In addition to the required operating pressure control, each individual automatically fired steam boiler shall have a high steam pressure limit control that will shut off the fuel supply to the boiler to prevent pressure in excess of the maximum allowable working pressure. The high limit control shall be equipped with a manual reset which shall prevent the boiler from being fired after the maximum pressure has been reached until the operator resets the switch manually. Steam boilers shall be provided with a syphon(s) or equivalent which will provide a water seal and protect the pressure control(s) from being damaged by the steam.

(b) Each automatically fired hot water heating boiler, hot water supply boiler, water heater or each system of commonly connected hot water heating or supply boilers shall have at least one temperature-actuated control to shut off the fuel supply when the system water reaches a preset operating temperature. In addition to the required temperature control, each individual automatically fired hot water heating boiler, hot water supply boiler, and water heater shall have a high temperature limit control that will prevent the water temperature from exceeding the maximum allowable temperature for the respective equipment. The high limit control for the hot water heating boilers and hot water supply boilers shall be equipped with a manual reset which shall prevent the boiler from being fired after the maximum temperature has been reached until the operator resets the switch manually.

(c) Automatic resets or remote resets by electronic means are prohibited. The manual reset may be incorporated in the high limit control. Where the reset device is separate from the high limit control, a means shall be provided to indicate actuation of the high limit control. Each high limit and operating control shall have its own sensing element and operating switch.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Recodified from 13 NCAC 13 .0407 Eff. January 1, 1995;
Amended Eff. July 1, 2006; January 1, 1995.*

13 NCAC 13 .0407 PRESSURE GAUGES

- (a) Boilers and pressure vessels, other than water heaters, shall be provided with a pressure indicating gauge which is visible to the operator on the floor or normal work platform.
- (b) Pressure gauges shall have a pressure range of not less than 1½ times the operating pressure, nor more than four times the operating pressure, except that steam heating boilers shall have an upper limit of not less than 30 psig nor more than 60 psig, and a dial travel of three inches between 0 psig and 30 psig.
- (c) Hot water storage vessels and expansion tanks in boiler systems need not be provided with a pressure gauge in addition to the gauge supplied on the boiler.
- (d) Steam boilers shall be provided with a syphon or equivalent which will provide a water seal and protect the gauge from being damaged by the steam.
- (e) Pressure vessels, other than those used as air compressor receiver tanks, may have a remotely located pressure indicating device or a system pressure monitoring device in lieu of a pressure gauge connected directly to the pressure vessel.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. January 1, 1995;
Amended Eff. July 1, 2006.*

13 NCAC 13 .0408 GAUGE GLASSES AND WATER COLUMNS

- (a) Steam boilers, except for forced flow steam boilers and forced flow water boilers requiring forced circulation to prevent overheating of the tubes, shall be provided with a visible gauge glass which will allow the operator to observe the water level of the boiler. Boilers with a maximum allowable working pressure in excess of 400 psig shall have two gauge glasses. Two independent remote level indicators may be used, in accordance with the ASME Code, in lieu of one of the gauges. Gauge glasses and remote level indicators must be visible to the operator while reading the pressure at the boiler.
- (b) Gauge glasses shall be mounted directly on the boiler or on a water column. Gauge glasses shall be mounted so that the lowest visible part of the gauge glass is above the lowest permissible water level by at least 2 inches for high pressure boilers and 1 inch for steam heating boilers. Gauge glasses may be installed with stop cocks or valves to allow for gauge glass replacement during boiler operation. The connections from the boiler shall be not less than 3/4 inch NPS up to and including the isolation valves, and not less than 1/2 inch outside diameter tubing from the isolation valve to the gauge glass.
- (c) Gauge glasses shall be provided with a drain valve or cock and discharge outlet at the bottom-most connection of not less than 1/4 inch diameter. The discharge outlet shall be piped to a safe location to prevent injury to the operator while blowing down the gauge glass.
- (d) Water columns, chambers which moderate fluctuations in water elevations for determining the operating water level in a boiler, when used, shall be designed, constructed, and stamped as required by the ASME Code. The piping connections to the boiler shall be not less than 1 inch

NPS for high pressure boilers or 3/4 inch NPS for heating boilers. Water columns shall have a drain valve and discharge outlet of not less than 3/4 inch NPS.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. January 1, 1995;
Amended Eff. July 1, 2006.*

13 NCAC 13 .0409 AUTOMATIC LOW-WATER FUEL CUTOFF CONTROLS AND WATER-FEEDING DEVICES

(a) Each automatically fired steam or vapor boiler, except miniature boilers, shall meet the following criteria:

- (1) Have at least two automatic low-water fuel cutoff devices.
- (2) One of the low-water fuel cutoff devices may also be used to regulate the normal water level.
- (3) Each cutoff device shall be installed to prevent startup and to shut down the boiler fuel or energy supply automatically when the surface of the water falls to a level not lower than the lowest visible part of the gauge glass.
- (4) One control shall be set to function ahead of the other. The lower fuel cutoff device shall be equipped with a manual reset which shall prevent the boiler from being fired after the low water limit has been reached until the operator resets the switch manually.
- (5) The low-water fuel cutoffs shall be attached directly to the boiler or to the water column. For float type low-water fuel cutoffs installed external to the boiler, each device shall be installed in individual chambers which shall be attached to the boiler by separate pipe connections below the waterline. Piping from the boiler shall be not less than 1 inch NPS. Low-water fuel cutoff designs embodying a float and float bowl shall have a vertical straightaway valved drain pipe of not less than 3/4 inch NPS at the lowest point in the water-equalizing pipe connections by which the bowl and the equalizing pipe can be flushed and the device tested.

(b) Each automatically fired hot water heating boiler with heat input greater than 400,000 Btu/hr (117 kW) shall meet the following criteria:

- (1) Be protected by a low-water fuel cutoff intended for hot water service.
- (2) The fuel cutoff device shall be installed to prevent startup and to shut down the boiler fuel or energy supply automatically when the surface of the water falls to a level not lower than the lowest safe permissible water level established by the boiler manufacturer.
- (3) The fuel cutoff device shall be equipped with a manual reset which shall prevent the boiler from being fired after the lowest water level has been reached until the operator resets the switch manually.
- (4) The low-water fuel cutoff installed in a hot water heating boiler system may be installed anywhere in the system above the lowest safe permissible water level established by the boiler manufacturer so long as there is no isolation valve installed between the device and the boiler. Connections to the system shall be not less than 1 inch NPS.

- (5) A means shall be provided for testing the operation of the low-water fuel cutoff on a hot water heating boiler system without resorting to draining the entire system.
- (c) Coil type boilers or watertube boilers requiring forced circulation to prevent overheating of the coils or tubes may have a flow-sensing device installed at or near the boiler proper, in lieu of a low-water fuel cutoff, to automatically cut off the fuel supply when the circulation of flow is interrupted. If there is a definitive water line, a low-water fuel cutoff complying with the forgoing shall be provided in addition to the flow-sensing device.
- (d) Electric boilers where uncovering of the electrical element can lead to an unsafe condition shall be equipped with a low-water fuel cutoff device. In the case of electrode type boilers, where the reduction in water level provides a self-limiting control on heat input, a low-water cutoff control is not required.
- (e) Automatically fired boilers shall be provided with a system to automatically maintain a constant water level so that the water level cannot fall below the lowest safe water line.
- (f) Low water fuel cutoff devices embodying a float and float bowl shall be installed so that the boiler feedwater or makeup water cannot be introduced through the float chamber.

*History Note: Authority G.S. 95-69.14;
Eff. January 1, 1982;
Recodified from 13 NCAC 13 .0416 Eff. January 1, 1995;
Amended Eff. January 1, 2009; July 1, 2006; January 1, 1995.*

13 NCAC 13 .0410 TEMPERATURE GAUGES

High temperature water boilers, hot water heating boilers, hot water supply boilers, and water heaters shall be provided with a temperature gauge, installed as close as practicable to the hot water outlet, which will indicate the temperature in degrees Fahrenheit. The indicating device shall have a range of approximately 2 times the intended operating temperature, but in no case shall the indicating device have a range of less than 1 1/2 times nor more than 4 times the intended operating temperature.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. January 1, 1982;
Recodified from 13 NCAC 13 .0411 Eff. January 1, 1995;
Amended Eff. July 1, 2006; January 1, 1995.*

13 NCAC 13 .0411 VALVES, DRAINS, AND BOTTOM BLOWOFFS

- (a) High pressure boilers operating in excess of 100 psig must be provided with two stop valves for boiler blowoff and drain outlets. Any boiler having a common steam connection with another boiler, and having a manhole opening, shall be provided with two steam outlet stop valves with an ample free-blow drain or vent between the two stop valves. The discharge of this drain shall be visible to the operator while operating the valve.
- (b) All boilers, except for coil-type water tube boilers, shall be provided with a drain outlet and stop valve of not less than 3/4 inch NPS at the lowest water containing space, except that if the boiler is provided with a blowoff outlet at the lowest water containing space, an additional drain outlet is not required.

- (c) High pressure boilers shall be provided with a bottom blowoff outlet and valve of not less than 1 inch NPS nor more than 2 1/2 inches NPS, except as modified below:
- (1) Miniature high pressure boilers shall have a blowoff outlet of not less than 3/4 inch NPS.
 - (2) Electric high pressure boilers not greater than 200kW shall have a blowoff outlet of not less than 3/4 inch NPS.
 - (3) High pressure boilers having a heating surface not greater than 100 square feet shall have a blowoff outlet of not less than 3/4 inch NPS.
 - (4) All other high pressure boilers shall have a blowoff outlet of not less than 1 inch NPS.
- (d) Steam heating boilers shall be provided with a bottom blowoff outlet and valve of not less than 1 inch NPS nor more than 2 1/2 inches NPS, except as modified below:
- (1) Steam heating boilers having a minimum safety valve relieving capacity not exceeding 500 pounds of steam per hour shall have a blowoff outlet of not less than 3/4 inch NPS.
 - (2) Steam heating boilers having a minimum safety valve relieving capacity greater than 1205 pounds of steam per hour but not greater than 2500 pounds of steam per hour shall have a blowoff outlet of not less than 1 1/4 inches NPS.
 - (3) Steam heating boilers having a minimum safety valve relieving capacity greater than 2500 pounds of steam per hour but not greater than 6000 pounds of steam per hour shall have a blowoff outlet of not less than 1 1/2 inches NPS.
 - (4) Steam heating boilers having a minimum safety valve relieving capacity greater than 6000 pounds of steam per hour shall have a blowoff outlet of not less than 2 inches NPS.
 - (5) All other steam heating boilers shall have a blowoff outlet of not less than 1 inch NPS.
- (e) All blowoff from boilers shall discharge into a blowdown tank suitable for separating steam and water or shall be piped to prevent injury. Discharge directly to a sewer is prohibited.
- (f) Valves for high pressure boilers shall be designed and constructed in accordance with the requirements of ASME Section I, and shall be stamped or embossed with the pressure/temperature rating of the valve.
- (g) Valves for heating boilers shall be suitable for the operating pressure and temperature of the boiler.
- (h) Pressure reducing valves shall be installed in the makeup water line where inlet supply water pressure is more than 75 percent of the maximum allowable working pressure of the boiler or pressure vessel.
- (i) A shutoff valve shall be provided in the makeup water line next to each boiler. For a series of boilers having a single water makeup line, the valve shall be installed next to the boiler piping system. If the water-containing capacity of the boiler exceeds 120 gallons, a check valve shall be installed on the source side of the shutoff valve.
- (j) Pressure vessels subject to corrosion shall be equipped with a drain valve installed at the lowest point of the pressure vessel or by installation of an internal drain pipe installed not less than 1/4 inch above the lowest internal surface.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. January 1, 1995;*

Amended Eff. July 1, 2006.

13 NCAC 13 .0412 EXPANSION TANKS

- (a) Hot water heating systems shall allow for thermal expansion and contraction of the piping to prevent excessive stress from being introduced into the pipe or connected equipment.
- (b) When new equipment is installed and a backflow prevention system is installed or already exists on a potable water supply line for a water heater, expansion tanks shall be installed. For water heaters, backflow preventers or check valves may be installed at the meter in water systems.
- (c) When expansion tanks are used they shall be constructed and stamped in accordance with the requirements of this Chapter for pressure vessels, unless exempted due to the vessel size or operating limits.
- (d) For a closed type system the expansion tank shall be not less than that determined as follows:
 - $V_t = [(0.00041T - 0.0466)V_s] / [(P_a/P_f) - (P_a/P_o)]$ where:
 - V_t = minimum volume of tank(s), gal
 - V_s = volume of system, not including tanks, gal
 - T = average operating temperature, deg F
 - P_a = atmospheric pressure, psi
 - P_f = fill pressure, psi
 - P_o = maximum operating pressure, psi.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Recodified from 13 NCAC 13 .0410 Eff. January 1, 1995;
Amended Eff. January 1, 2009; January 1, 1995.*

13 NCAC 13 .0413 CLEARANCES

- (a) All boilers and pressure vessels shall be located so that adequate space is provided for proper operation, including visibility of all gauges, for the inspection of all surfaces, tubes, waterwalls, economizers, piping, valves and other equipment, and for maintenance and repair, including replacement of tubes. Boiler clearances shall remain free of all items, including temporarily stored items, other than boiler piping and trim. Boiler piping and trim shall not impede access to the boiler.
- (b) Adequate clearance for boilers and pressure vessels installed prior to January 1, 2009 shall not be less than the following:
 - (1) Three feet of clearance shall be provided between the boiler or pressure vessel on all service sides, and clearances as recommended by the manufacturer on all other sides. Service side shall be interpreted as any side, including the top, of a boiler or pressure vessel on which clearance is necessary to access operating controls, safety devices, drain and blowoff valves, or inspection openings.
 - (2) Cabinet mounted boilers, such as those used primarily for process or cooking, and having a maximum input of 400,000 Btu/hr need only be provided with the unobstructed clearances recommended by the manufacturer.
- (c) Adequate clearance for boilers and pressure vessels installed after January 1, 2009 shall not be less than the following:

- (1) High-pressure steam boilers that exceed 5,000,000 Btu/hr input (1465 kW), 5,000 pounds of steam per hour capacity or a 1,000-square-foot heating surface shall have a minimum unobstructed clearance of seven feet from the top of the boiler to the ceiling.
 - (2) The following types of boilers and pressure vessels shall have a minimum unobstructed clearance of three feet from the top of the boiler to the ceiling:
 - (A) Steam-heating boilers and hot-water-heating boilers that exceed 5,000,000 Btu/hr input (1465 kW), 5,000 pounds of steam per hour capacity or a 1,000-square-foot heating surface;
 - (B) High-pressure steam boilers that do not exceed 5,000,000 Btu/hr input (1465 kW), 5,000 pounds of steam per hour capacity or a 1,000-square-foot heating surface; and
 - (C) All boilers with manholes on top of the boiler.
 - (3) Package boilers, steam-heating boilers and hot-water-heating boilers without manholes on top of the shell that do not exceed 5,000,000 Btu/hr input (1465 kW), 5,000 pounds of steam per hour capacity or a 1,000-square-foot heating surface shall have a minimum unobstructed clearance of two feet from the ceiling.
- (d) When boilers or pressure vessels are installed or replaced, unobstructed clearance shall be provided to allow access for inspection, maintenance and repair. Passageways around all sides of boilers and pressure vessels shall have an unobstructed width of not less than 18 inches, unless otherwise recommended by manufacturer's installation instructions.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Recodified from 13 NCAC 13 .0409 Eff. January 1, 1995;
Amended Eff. February 1, 2009; January 1, 1995.*

13 NCAC 13 .0414 GAS-FIRED JACKETED STEAM KETTLE

Gas-fired jacketed steam kettles having a steam space of such size that they are subject to the rules in this Chapter shall be equipped with the operating controls and safety devices required for boilers, except that only one low water fuel cutoff control is required.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. January 1, 2009; July 1, 2006; January 1, 1995.*

13 NCAC 13 .0415 AGE LIMIT FOR CERTAIN BOILERS AND PRESSURE VESSELS

(a) Except as provided in Paragraph (b) of this Rule, a boiler or pressure vessel shall not be operated for longer than 20 years from the date of its installation if it is not constructed according to the ASME Code and has riveted longitudinal lap joints.

(b) The Chief Inspector may authorize operation of a boiler or pressure vessel meeting the criteria listed in Paragraph (a) of this Rule after the owner or user satisfactorily completes such additional examinations, tests, and engineering evaluations as may be deemed necessary by the Chief Inspector, to demonstrate that the boiler or pressure vessel is suitable for operation at the maximum allowable working pressure for the term of the inspection certificate.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Recodified From 13 NCAC 13 .0405 Eff. January 1, 1995;
Amended Eff. July 1, 2006; January 1, 1995.*

13 NCAC 13 .0416 REINSTALLATION OF CERTAIN BOILERS AND PRESSURE VESSELS

(a) A boiler or pressure vessel that is not constructed pursuant to the accepted design and construction code shall not be reinstalled at any location in this State when the reinstallation is accompanied by a change of ownership of the boiler or pressure vessel unless the owner/user receives authorization in writing from the Chief Inspector.

(b) Used boilers or pressure vessels shall not be installed unless an application for permission to install the equipment has been approved in writing according to the rules in this Chapter by the Chief Inspector followed by a certificate inspection by a Deputy Inspector.

(c) Applications to install used or nonstandard boilers or pressure vessels must be made in writing to the Chief Inspector.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Recodified from 13 NCAC 13 .0406 Eff. January 1, 1995;
Amended Eff. January 1, 2009; July 1, 2006; January 1, 1995.*

13 NCAC 13 .0417 SUPPORTS

Each boiler and pressure vessel shall be supported by masonry or structural supports of sufficient strength and rigidity to safely support the boiler or pressure vessel and its contents and distribute the weight contained thereon. There shall be no excessive vibration in the boiler, pressure vessel, or connected piping or fittings.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Recodified from 13 NCAC 13 .0408 Eff. January 1, 1995;
Amended Eff. January 1, 2009.*

13 NCAC 13 .0418 VENTING OF NON-PRESSURIZED CONDENSATE RECEIVERS

Two means of venting shall be provided on any condensate receiver tank equipped with an internal float. The tank shall have two separate connections, one to be used as a vent and one as an overflow, and shall be so piped.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Recodified from 13 NCAC 13 .0412 Eff. January 1, 1995.*

13 NCAC 13 .0419 AIR AND VENTILATION REQUIREMENTS

- (a) Unobstructed air openings shall be sized on the basis of 1 sq. in. (650 sq. mm) free area per 2000 Btu/hr. maximum fuel input of the combined burners located in the boiler room, or as specified in the National Fire Protection Association (NFPA) standards for oil and gas burning installations for the particular job conditions. The boiler room air supply openings shall be kept clear at all times.
- (b) Power ventilators or fans shall be sized on the basis of 0.2 cfm (0.0057 cubic meters per minute) for each 1000 Btu/hr. of maximum fuel input for the combined burners of all boilers and water heaters located in the boiler room.
- (c) When power ventilators or fans are used to supply combustion air they shall be installed with interlock devices so that the burners will not operate without an adequate number of ventilators/fans in operation.
- (d) Oil, gas and solid fuel fired boilers and pressure vessels shall be equipped with exhaust flues, stacks, or chimneys discharging to a safe point outside of the building.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. January 1, 1982;
Recodified from 13 NCAC 13 .0413 Eff. January 1, 1995;
Amended Eff. July 1, 2006; January 1, 1995.*

13 NCAC 13 .0420 FIRING MECHANISM CONTROLS

- (a) Automatically fired boilers and pressure vessels shall be provided with firing mechanism controls.
- (b) Oil, gas-fired, and electrically heated boilers shall be equipped with primary (flame safeguard) safety controls, safety limit switches, and burners or electric elements that are listed and labeled with a testing laboratory recognized by the Occupational Safety and Health Administration as a nationally recognized testing laboratory (NRTL) pursuant to 29 CFR 1910.7.
- (c) Automatically fired boilers installed after January 1, 2007, shall be provided with a remote emergency fuel shut-off switch marked for easy identification. The remote shut-off switch shall be located outside each door of the room in which the boiler is located. Alternatively, the shut-off switch may be located just inside the entrance door(s) where the equipment is located. If there is more than one door to the boiler room, there shall be a switch located at each door designed for primary emergency egress from the boiler room.
- (d) For installations which are gas-fired, the burners used shall conform to the North Carolina Fuel Gas Code in effect at the time of installation.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. January 1, 1995;
Amended Eff. February 1, 2009; July 1, 2006.*

13 NCAC 13 .0421 NORTH CAROLINA SPECIAL

- (a) The North Carolina Department of Labor may issue an inspection certificate for a boiler or pressure vessel constructed under standards equivalent to those established in the ASME Code if an application for permission to construct and install a North Carolina Special is submitted to

and approved by the Chief Inspector prior to commencing construction. The Chief Inspector may approve a request for an inspection certificate if the application is complete and if the information contained in the application demonstrates that the boiler or pressure vessel is as safe as a similar boiler or pressure vessel constructed to the requirements of the ASME Code. The application, which may be in the form of a letter, shall contain relevant data proving that its construction is equivalent to ASME standards. The Chief Inspector or his designee may elect to visit, at the expense of the owner, user or manufacturer, the facility where the boiler or pressure vessel is under construction in order to audit the manufacturer's construction techniques, personnel qualifications, and quality control program.

(b) The North Carolina Department of Labor may issue an inspection certificate for a boiler or pressure vessel which has operated in another state even if the ASME construction and stamping requirements otherwise contained in the North Carolina Rules are not satisfied if the following requirements are satisfied:

- (1) the state in which the boiler or pressure vessel was operated enforces ASME Code requirements for similar boilers and pressure vessels;
- (2) the boiler or pressure vessel was inspected during construction by an inspector commissioned by the state in which the item was installed or manufactured; and
- (3) the report from the last certificate inspection conducted in the state in which the boiler or pressure vessel was previously installed is made available to the Chief Inspector, and the inspection resulted in the applicable authorization for operation.

(c) The applicant shall submit a design specification, certified by a professional engineer, to the Chief Inspector to verify that the boiler or pressure vessel meets the ASME Code as far as is practicable. The following documentation shall be included as a minimum:

- (1) design calculations and drawings;
- (2) material test reports or their equivalent, and for material not allowed by ASME, an evaluation of the materials in comparison to the most similar material approved for ASME construction;
- (3) a record of welding qualifications as required by Section IX of the ASME Welding and Brazing Qualifications Code; and
- (4) satisfactory results of any additional examination or test deemed necessary by the Chief Inspector.

(d) Design calculations for pressure vessels to be operated in excess of 3,000 psig shall include a fatigue analysis as described in ASME Section VIII, Division 2 or 3, to determine the operating lifetime of the pressure vessel, and a proposal for operation that details the owner's monitoring program to verify compliance with the fatigue analysis.

(e) The maximum allowable working pressure for the boiler or pressure vessel as established in the calculations shall be consistent with what is required by the ASME Code for similar boilers or pressure vessels.

(f) Boilers and pressure vessels operating as North Carolina State Specials shall meet all installation, alteration, inspection, repair, and operation requirements of this Chapter.

(g) The Chief Inspector may approve operation of boilers and pressure vessels which were constructed to the requirements of a department of the federal government which enforces requirements equivalent to the ASME Code, provided an application as otherwise required by this Chapter is submitted to the Chief Inspector and found acceptable.

History Note: Authority G.S. 95-69.11; 95-69.14;

Eff. May 29, 1981;
Amended Eff. March 2, 1992;
Recodified from 13 NCAC 13 .0415 Eff. January 1, 1995;
Amended Eff. July 1, 2006; January 1, 1995.

13 NCAC 13 .0422 EXHIBITION BOILERS

In addition to the requirements outlined in this Chapter for manually fired boilers, exhibition boilers shall meet the following requirements:

- (1) Exhibition boilers that are not built to the ASME Code shall not be operated above 125 psig without specific written approval by the Chief Inspector who shall base such approval on documentation and calculations submitted by the owner. These documents and an inspection shall support higher pressure ratings.
- (2) Safety relief valves shall not exceed the maximum allowed working pressure and shall be ASME/NB certified valves.
- (3) Each boiler shall have as a minimum;
 - (a) A properly operating pressure gauge which shall be approximately double the pressure to which the safety relief valve is set but in no case shall it be less than 1 1/2 times the set pressure.
 - (b) A safety relief valve which shall be capable of protecting the boiler from over pressurization.
 - (c) A water gauge glass
- (4) When fusible plugs are used, they shall be replaced every two years with appropriately sized plugs of the required material.
- (5) A hydrostatic test may be required by the inspector if, in his opinion, it is necessary to prove the integrity of the pressure boundary. The hydrostatic test shall not exceed 100% of the maximum allowed working pressure of the vessel or the set pressure of the safety valve, whichever is greater.
- (6) Upon successful completion of the inspection and payment of fees the Chief Inspector shall issue a Certificate of Inspection valid for one year.

History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. July 1, 2006.

13 NCAC 13 .0423 MODEL HOBBY BOILERS

In addition to the requirements outlined in this Chapter for manually fired boilers, model hobby boilers shall meet the following requirements:

- (1) Each boiler shall have as a minimum;
 - (a) A properly operating pressure gauge that shall not be less than 1 ½ times nor more than four times the operating pressure of the boiler;
 - (b) Two safety relief valves each of which shall be capable of protecting the boiler from over pressurization. Requirements for ASME/NB certification are waived;
 - (c) An easily accessible mud-ring valve;
 - (d) A water gauge glass; and
 - (e) If constructed of copper, a fusible plug in the top of the crown sheet.

- (2) Upon successful completion of the inspection and payment of the fees, the Chief Inspector shall issue a Certificate of Inspection valid for one year.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. July 1, 2006.*

SECTION .0500 - NON-STANDARD BOILERS AND PRESSURE VESSELS

13 NCAC 13 .0501 GENERAL REQUIREMENTS

(a) All aspects of a nonstandard boiler or pressure vessel including, but not limited to, its installation, repair, alteration, inspection, appurtenances, and operation shall conform to the ASME Code and the National Board Inspection Code and the Rules in this Chapter, except for the design criteria for the boiler or pressure vessel proper and pressure piping.

(b) Replacement parts for the boiler or pressure vessel shall conform to the ASME Code and the Rules in this Chapter.

(c) An inspector shall determine the maximum allowable working pressure for a nonstandard boiler or pressure vessel in accordance with the Rules in this Chapter.

(d) The maximum allowable working pressure on the shell of a nonstandard boiler or pressure vessel shall be determined by the strength of the weakest course computed from the thickness of the plate, the tensile strength of the material, the efficiency of the longitudinal joint, inside diameter of the weakest course and the factor of safety set by the Rules in this Chapter.

(e) For cylindrical pressure parts subject to internal pressure:

$(TStE)/(RFS)$ = maximum allowable working pressure, psig.

(f) Design variables:

- (1) TS = ultimate tensile strength of shell plate; if unknown, it shall be taken as 45,000 psi;
- (2) t = minimum thickness of shell plate of weakest course, in inches;
- (3) E = efficiency of longitudinal joint depending upon construction;
 - (A) values for riveted joints are determined by calculated riveted efficiency; and
 - (B) values for fusion welded joints and riveted joints are determined pursuant to the following table:

WELD JOINT DESIGN	EFFICIENCY
Single lap weld	0.40
Double lap weld	0.50
Single butt weld	0.60
Double butt weld	0.75

RIVETED JOINT DESIGN	EFFICIENCY
Single lap	0.58
Double lap	0.74
Double butt and strap	0.82
Triple butt and strap	0.84
Quadruple butt and strap	0.94

- (4) R = inside radius of weakest course of shell, in inches, provided the thickness does not exceed 10 percent of the radius; if the thickness is over 10 percent of the radius, the outer radius shall be used;
- (5) FS = factor of safety allowed by the Rules in this Chapter.
- (g) The maximum allowable working pressure for cylindrical nonstandard boilers and pressure vessels subject to external pressure, flat or formed heads, and non-circular boilers and pressure vessels shall be determined by the most applicable rules for new construction in the ASME Code.
- (h) The maximum allowable working pressure for cast iron boilers, including boilers having cast iron shells or heads and steel or wrought iron tubes, shall be not greater than 30 psig for water service and 15 psig for steam service.
- (i) Replacement parts, repair, and alteration of nonstandard boilers and pressure vessels shall be as required for ASME stamped boilers and pressure vessels of similar design.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. July 1, 2006; January 1, 1995.*

13 NCAC 13 .0502 NONSTANDARD HEATING BOILERS
13 NCAC 13 .0503 NONSTANDARD PRESSURE VESSELS

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Repealed Eff. January 1, 1995.*

13 NCAC 13 .0504 FACTORS OF SAFETY

- (a) For nonstandard boilers, the factor of safety is four and one-half, except for horizontal-return tubular boilers having continuous longitudinal lap seams more than twelve feet in length, where the factor of safety is eight. When this latter type of boiler is removed from its existing setting, it shall not be reinstalled for pressure in excess of fifteen psig.
- (b) The factor of safety for nonstandard boilers with lap-riveted longitudinal seams less than twelve feet in length is six.
- (c) The factor of safety for a nonstandard boiler with butt and double-strapped longitudinal seams is five.
- (d) For nonstandard pressure vessels, the factor of safety is four, except that for non-ASME Code constructed hydropneumatic storage tanks containing water under pressure at ambient temperatures the factor of safety is two.

*History Note: Filed as a Temporary Amendment [(e)! Eff. March 10, 1982, for a Period of 120 Days to
Expire on July 8, 1982;
Statutory Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. June 1, 1982;
Readopted [(e) Eff. January 1, 1986];
Amended Eff. January 1, 1995.*

**SECTION .0600 - HOT WATER VESSELS USED FOR HEATING OR FOR STORAGE
OF HOT WATER**

- 13 NCAC 13 .0601 MINIMUM STANDARDS**
- 13 NCAC 13 .0602 DISCHARGE LINES**
- 13 NCAC 13 .0603 VESSELS HEATED INDIRECTLY BY STEAM OR WATER**
- 13 NCAC 13 .0604 PROHIBITION AGAINST USE**
- 13 NCAC 13 .0605 VENT PIPES**
- 13 NCAC 13 .0606 HEAT SOURCE STANDARDS**
- 13 NCAC 13 .0607 ACCESS TO THE VESSEL**
- 13 NCAC 13 .0608 PRESSURE-REDUCING VALVES IN CITY LINES**
- 13 NCAC 13 .0609 SHUTOFF VALVES**

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. February 1, 1985; January 1, 1982;
Repealed Eff. January 1, 1995.*

SECTION .0700 - NUCLEAR POWER SYSTEMS

13 NCAC 13 .0701 STANDARDS

- (a) Nuclear power components and systems covered under the scope of Section III of the ASME Code shall be designed, constructed, reworked, stamped, and installed in accordance with Section III of the ASME Code. Balance of plant items may be constructed under other ASME Code sections as appropriate.
- (b) All nuclear power systems falling under the scope of the ASME Code, Section III, are inspected in service under the requirements of Section XI of the ASME Code. The equipment is not required to be inspected under this Chapter. Balance of plant pressure equipment not covered by Section XI are required to be registered with a North Carolina identification number and inspected in accordance with this Chapter.
- (c) A vessel composed of two or more pressure retaining compartments shall constitute one complete unit for the purpose of assigning the North Carolina identification number.
- (d) The design criteria for nuclear power systems shall be certified as to compliance with Section III of the ASME Code by a registered professional engineer with at least one year of experience in nuclear pressure vessel design.

*History Note: Authority G.S. 95-69.9; 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. October 1, 2008; July 1, 2006; June 1, 1982.*

13 NCAC 13 .0702 INSPECTION DURING CONSTRUCTION

The constructor of a nuclear power plant shall have a contract with an Authorized Inspection Agency who will be responsible for ASME Code, Section III third party code inspections. It is the duty of the Authorized Nuclear Inspector (ANI) to conduct all of the inspections specified by the rules of the ASME Code, Section III and ASME QAI-1, in addition to such other inspections and tests as in his judgment are necessary to verify that the equipment is fabricated and installed in accordance with requirements of the ASME Code and these Rules.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. July 1, 2006.*

13 NCAC 13 .0703 INSERVICE INSPECTION

The owner/operator of an operating nuclear power plant shall have a contract with an Authorized Inspection Agency who will be responsible for ASME Code, Section III and Section XI third party code inspections. It is the duty of the ANI and Authorized Nuclear In-service Inspector (ANII), as applicable, to make all of the inspections specified by the rules of the ASME Code, Section III, Section XI and ASME QAI-1, and any other inspections and tests necessary to verify that the equipment is inspected, examined, repaired or replaced in accordance with requirements of the ASME Code.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. July 1, 2006.*

13 NCAC 13 .0704 INSPECTOR QUALIFICATIONS

*History Note: Authority G.S. 95-69.11; 95-69.14; 95-69.15;
Eff. May 29, 1981;
Repealed Eff. July 1, 2006.*

13 NCAC 13 .0705 SEMI-ANNUAL AUDIT OF NUCLEAR INSPECTORS

The Authorized Inspection Agency shall maintain qualified Authorized Nuclear Supervisors (ANIS) to monitor the performance of the ANI and ANII and to audit the activities at the nuclear power plants for which inspection agreements have been made. The ANIS shall conduct audits of all the aspects of a ANI and ANII activities at the nuclear power plant.

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Amended Eff. July 1, 2006.*

13 NCAC 13 .0706 CONSTRUCTION

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Repealed Eff. July 1, 2006.*

SECTION .0800 - FORMS

- 13 NCAC 13 .0801 INSPECTION CERTIFICATE**
- 13 NCAC 13 .0802 APPLICATION FOR A NORTH CAROLINA COMMISSION**
- 13 NCAC 13 .0803 NORTH CAROLINA CERTIFICATE OF COMPETENCY**
- 13 NCAC 13 .0804 NORTH CAROLINA COMMISSION**
- 13 NCAC 13 .0805 OWNER-USER AGENCY APPLICATIONS**
- 13 NCAC 13 .0806 OWNER-USER INSPECTION AGENCY STATEMENTS**
- 13 NCAC 13 .0807 INSPECTION REQUEST**
- 13 NCAC 13 .0808 INCIDENT REPORT**
- 13 NCAC 13 .0809 INSPECTION REPORT**

*History Note: Authority G.S. 95-69.11; 95-69.13; 95-69.14; 95-69.15;
Eff. May 29, 1981;
Amended Eff. January 1, 1995; June 1, 1982;
Repealed Eff. July 1, 2006.*

13 NCAC 13 .0810 REINSPECTION REPORT

*History Note: Authority G.S. 95-69.11;
Eff. May 29, 1981;
Repealed Eff. January 1, 1995.*

- 13 NCAC 13 .0811 INSPECTION SERVICE AGREEMENT**
- 13 NCAC 13 .0812 REPORT OF REPAIR OR ALTERATION**
- 13 NCAC 13 .0813 AUDIT REPORT**

*History Note: Authority G.S. 95-69.11;
Eff. May 29, 1981;
Amended Eff. January 1, 1995, June 1, 1982;
Repealed Eff. July 1, 2006.*

13 NCAC 13 .0814 REPORT OF NUCLEAR INSPECTOR'S ACTIVITIES

*History Note: Authority G.S. 95-69.11;
Eff. May 29, 1981;
Repealed Eff. January 1, 1995.*

13 NCAC 13 .0815 REPAIR LETTER NOTICE OF NONCOMPLIANCE

*History Note: Authority G.S. 95-69.11;
Eff. May 29, 1981;*

*Amended Eff. January 1, 1995;
Repealed Eff. July 1, 2006.*

13 NCAC 13 .0816 MENACE TO PUBLIC SAFETY LETTER

*History Note: Authority G.S. 95-69.11;
Eff. May 29, 1981;
Repealed Eff. January 1, 1995.*

13 NCAC 13 .0817 MENACE TO PUBLIC SAFETY NOTICE

*History Note: Authority G.S. 95-69.11; 95-69.14;
Eff. May 29, 1981;
Repealed Eff. November 1, 2006.*