NEBRASKA ADMINISTRATIVE CODE

TITLE 229 - DEPARTMENT OF LABOR

CHAPTER 4 - GENERAL REQUIREMENTS FOR BOILERS AND PRESSURE VESSELS

001. This chapter is adopted pursuant to *Neb. Rev. Stat.* §48-727.

002. Any required safety appliance shall not be removed or tampered with except for the purpose of repair or inspection.

003. Where pressure reducing valves are used in a system, the following requirements shall be met:

A. If the piping equipment on the low pressure side has not been designed for the full initial pressure, one or more relief or safety valves shall be provided on the low pressure side of the reducing valve;

1. The relief or safety valves shall be located, adjoining, or as close as possible to the reducing valve. Proper protection shall be provided to prevent injury or damage caused by the escaping fluid from the discharge of relief or safety valves that are vented to the atmosphere.

2. The set point, in PSI, shall be no higher than the design pressure of the system on the low pressure side of the reducing valve.

B. If a bypass is used around the reducing valve, a safety valve is required on the low pressure side and shall be of sufficient capacity to relieve all the fluid that can pass through the bypass without over pressuring the low pressure side.

C. The combined discharge capacity of the relief valves or safety valves shall be such that the pressure rating of the lower pressure piping shall not be exceeded in case the reducing valve sticks open.

D. A pressure gauge shall be installed on the low pressure side of a reducing valve.

004. The blowdown from a boiler that enters a sanitary sewer system or which is considered a hazard to life or property, shall pass through proper blowoff equipment that will reduce pressure and temperature. The temperature of the fluid leaving the blowoff equipment shall be in accordance with local codes, but in all cases shall not exceed 150 degrees Fahrenheit and the pressure shall not exceed five pounds per square inch. The blowoff piping and fittings between the boiler and the blowoff tank shall comply with the ASME Code B31.1.

005. The discharge from safety valves, safety relief valves, blowoff pipes and other hazardous fluid outlets shall be so arranged that there will be no danger of injury to personnel. When the safety valve or temperature/pressure relief valve discharge is piped away from the boiler to the point of discharge, there shall be provisions made for properly draining the piping. The size and arrangement of discharge piping shall be such that any pressure that may exist or develop, will not reduce the relieving capacity of the relieving devices below that capacity required to protect the boiler or pressure vessel. Manifolding of discharges from multiple boilers or pressure vessels having different maximum allowable working pressures is not permitted unless verification, including design calculations and component specification, have been approved in advance by the person or entity who will perform the hydrostatic test and certification required in 229 NAC 2, §007. All safety or safety relief valves or pressure relief devices shall have a discharge pipe installed and is directed to a floor drain or other suitable and safe point of discharge. Such discharge piping shall be made of a metal or metal alloy that is capable of withstanding the forces, pressure, and temperature that exist when the valve to which it is attached is in operation.

006. For electric steam generators - a cable at least as large as one of the incoming power lines to the generator shall be permanently fastened to, and provide grounding of the generator shell.

A. A suitable screen or guard shall be provided around high tension electrical bushings and a sign shall be posted warning of high voltage. This screen or guard shall be so located that it will be impossible for anyone working around the generator to accidentally come in contact with the high voltage circuits.

B. All electrically heated boilers shall meet the applicable standards of, and be approved by, Underwriters' Laboratories, Inc.

007. All repairs and alterations must comply with the rules as defined in 229 NAC 15.

A. All welded repairs to jurisdictional boilers and pressure vessels shall be performed by an organization holding the applicable "R" stamp issued by the National Board, except that in the case of pressure vessels installed at an API-510 owner-user facility, the repair may be performed by a repair organization as defined in section 3.16 of API-510. All repairs require prior notification and approval of a commissioned inspector. The use of pre-approved routine repair procedures shall be handled as described in 229 NAC 15. All repairs shall conform to the edition of the NBIC or API-510 as required by 229 NAC 02.

B. The organization performing the repair or alteration shall be responsible for preparation, certification and distribution of the appropriate NBIC form or its equivalent under API-510. This form shall be filed with the Chief Boiler Inspector and with the National Board, if so required.

008. All boilers and pressure vessels shall be located so that adequate space is provided for the proper operation of the boiler or pressure vessel and its appurtenances, inspection, and necessary maintenance and repair.

009. Ladders and walkways or runways shall be provided between or over the top of boilers which are more than eight feet above the operating floor to afford accessibility for operation, maintenance and inspection.

A. All walkways, runways, and platforms shall be OSHA compliant and shall:

(1) Be of metal construction;
(2) Be constructed of safety treads, standard grating, or similar material and have a minimum width of 30 inches;

(3) Be of bolted, welded or riveted construction;
(4) Be equipped with handrails 42 inches high with an intermediate rail and 4 inch toe board; and
(5) Have gates or chains installed at entries and exits to the platform to reduce risk of falls.

B. Stairways which serve as a means of access to walkways, runways or platforms shall not exceed an angle of 45 degrees from the horizontal and be equipped with handrails 42 inches high with an intermediate rail.

C. Ladders which serve as a means of access to walkways, runways, or platforms shall:

(1) Be of metal construction and not less than 18 inches wide;
(2) Have rungs that extend through the side members and are permanently secured;
(3) Have a clearance of not less than 30 inches from the front of the rungs to the nearest permanent object on the climbing side of the ladder;
(4) Have a clearance of not less than 6-1/2 inches from the back of the rungs to the nearest permanent object; and
(5) Have a clearance width of at least 15 inches from the center of the ladder on either side across the front of the ladder.

D. There shall be at least two permanently installed means of egress from walkways, runways, or platforms that exceed six feet in length.

010. All boiler rooms exceeding five hundred square feet of floor area and containing one (1) or more gas fired objects having a fuel burning capacity in excess of 400,000 Btu/hr shall have two (2) means of exit.

011. A permanent source of outside air shall be provided for each boiler room to permit satisfactory combustion of the fuel as well as proper ventilation of the boiler room under normal operating conditions. The total air input required for all fuel burning equipment installed in the room, including non-jurisdictional, fired units, shall be used in determining the net intake area required. The requirements outlined in the following manuals or codes shall be used to determine the air and opening size required:

A. The boiler or water heater manufacturer's installation and operating manual;

B. NFPA-54, National Fuel Gas Code;

C. NFPA-85;

D. NFPA-58, LP-Gas Code; and

E. NFPA-31, Standard for the Installation of Oil Burning Equipment.

012. All boiler rooms exceeding five hundred square feet floor area and containing one (1) or more gas fired objects having a fuel burning capacity in excess of 400,000 Btu/hr shall have two (2) means of exit.

Condensate return tanks shall be equipped with at least two (2) vents or a vent and overflow pipe to protect against a loose float plugging a single connection.

013. If a boiler or pressure vessel has not been properly prepared for inspection as defined in 229 NAC 6 and/or as requested by the Inspector, the Inspector shall decline to make such inspection until the item has been properly prepared.

014. The applicable code of construction, or the appropriate API, ANSI, or NFPA code shall apply to all conditions not covered by these rules and regulations.

015. Whenever repairs are made to fittings and appliances or it becomes necessary to replace them, the work must comply with the requirements of the applicable construction code, the National Board Inspection Code and API-510 as appropriate for boilers and pressure vessels. For boilers that have control systems that are required to meet the rules of ASME CSD-1, when components of the control systems are repaired or replaced, the replacements and the affected part of the control system must meet the most current state adopted edition of ASME CSD-1 that is listed in 229 NAC 2 (010). For boilers that have control systems that were required to meet the rules of NFPA 8501, 8502, 8503, 8504, 8505, or 8506, when components of the control systems are repaired or replaced, the replacements and the affected part of the control system must meet the most current state adopted edition of NFPA 85 that is listed in 229 NAC 2 (010). If a part is replaced with a part that is like for like in make, model and specifications, an upgrade to the latest adopted edition/addenda of the applicable code is not required. If a part is replaced that is not like for like, that section of the control system shall be upgraded to the latest edition/addenda of the applicable code for the controls. When a fuel train is upgraded or replaced, the required emergency shutdown switch(s) shall be installed and the complete fuel train shall meet the latest adopted edition/addenda of the appropriate code. If there are any questions as to the need and extent of the upgrade, a detailed plan shall be submitted to the Chief Boiler Inspector outlining the make, model, and specifications of the component being removed and the make, model and specifications of the intended replacement part and any other necessary information to determine the need for an upgrade. This plan shall include which standards the component or portion of the system is designed and constructed to meet.

016. Special requirements for hydronic (glycol) heating systems.

A. Systems where there is a possibility of contamination between the potable water system and the heating system shall be protected in accordance with state and local codes. Where there are no local codes, the International Plumbing and Mechanical Codes should be used as a reference for the protection of the potable water system.

B. All boilers supplying the heating system shall have safety controls to protect against a low water condition. The controls shall shut down the boiler and require a manual restart. The controls shall be installed and meet the requirements of ASME CSD-1, Part CW for the specific type of boiler.

C. A means shall be provided to refill the hydronic heating system. This means can either fill the system while in operation or require a shutdown prior to filling.

D. The discharge from the boiler safety relief valve and the boiler drains shall be piped to an atmospheric collection tank. The ends of the piping shall be visible to determine if a safety relief valve or drain valve is leaking past the seat. Certain types of glycol require a special permit for discharge to a city sewer system.

The requirement for an atmospheric collection tank may be waived provided the owner or installer provides documentation to the Chief Boiler Inspector that the municipality has approved the discharge of the glycol mixture to the sewer system. This documentation shall include the type of glycol to be used, its concentration in the system, and a signature and title of the approving authority.

E. Hydronic piping systems shall be designed and installed to permit the system to be drained. Where the system drains to the plumbing drainage system, the installation shall conform to the local codes. Where there are no local codes the International Plumbing and Mechanical Codes should be used as a reference.

F. The boiler shall have isolation valves on the inlet and outlet piping.

G. All boilers used in hydronic heating systems shall meet the requirements of ASME Section IV, Part HG, and shall be stamped with the ASME Certification Mark with the "H" Designator. Units with the ASME Certification Mark with the "HLW" Designator or items certified as meeting the requirements of ANSI Z21.10.3 shall not be used in hydronic heating systems.

H. Records shall be maintained and available to the inspector that show the required glycol concentration, the results of all tests performed to ensure the concentration percentage is being maintained and the addition of glycol to the system.