

## Chapter ILHR 41

### ADMINISTRATION, INSPECTION AND GENERAL INSTALLATION REQUIREMENTS

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Note: Chapter ILHR 41 as it existed on February 29, 1988 was repealed and a new chapter ILHR 41 was created effective March 1, 1988.

#### Subchapter I—Scope, Definitions and Administration

**ILHR 41.01 Purpose.** Pursuant to s. 101.17, Stats., the purpose of chs. ILHR 41 and 42 is to protect the health, safety and welfare of the public and employes by establishing minimum standards for the design, construction, installation, operation, inspection, testing, maintenance, alteration and repair of boilers and pressure vessels installed in all public buildings and places of employment.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.02 Scope.** (1) **BOILERS AND PRESSURE VESSELS.** The provisions of chs. ILHR 41 and 42 shall apply to boilers and piping components associated with boilers, and to pressure vessels and power piping, in use at places of employment and in public buildings. The provisions of these chapters are not retroactive unless specifically stated in the administrative rule. Where different sections of these chapters specify different requirements, the most restrictive requirement shall govern.

Note: Section 101.01 (2), Stats., provides that the phrase place of employment means and includes every place, whether indoors or out or underground and the premises appurtenant thereto where either temporarily or permanently any industry, trade or business is carried on, or where any process or operation, directly or indirectly related to any industry, trade or business, is carried on, and where any person is, directly or indirectly employed by another for direct or indirect gain or profit, but does not include any place where persons are employed in private domestic service which does not involve the use of mechanical power or in farming. Farming includes those activities specified in s. 102.04 (3), Stats., and also includes the transportation of farm products, supplies or equipment directly to the farm by the operator of said farm or his employes for use thereon, if such activities are directly or indirectly for the purpose of producing commodities for market, or as an accessory to such production. When used with relation to building codes, place of employment does not include a previously constructed building used as a community-based residential facility as defined in s. 50.01 (1), Stats., which serves 20 or fewer unrelated residents, except for the purposes of s. 101.11, Stats.

(2) **OTHER VESSELS.** The provisions of chs. ILHR 41 and 42 shall apply to vessels used for the storage and transportation of flammable liquids, liquefied petroleum gas, liquefied natural gas, compressed natural gas, anhydrous ammonia and refrigerants,

unless these vessels are covered by other Wisconsin administrative codes or federal codes.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88

**ILHR 41.04 Definitions.** The definitions contained in this section shall be applicable throughout chs. ILHR 41 and 42.

(1) "Alteration" means a change in a boiler or pressure vessel that substantially alters the original design and that requires consideration of the effect of the change on the original design. Alteration does not include the addition to a boiler or pressure vessel of nozzles smaller than an unreinforced opening size.

(2) "Approved" means acceptable to the department.

(3) "ASME code" means the boiler and pressure vessel code published by the American society of mechanical engineers.

(4) "Authorized inspector" means a boiler or pressure vessel inspector who holds a valid certificate of competency issued by the department.

(5) "Boiler" means a vessel intended for use in heating water or other fluids or for generating steam or other vapors by the application of heat.

(6) "Boiler external piping" means piping within the scope of ASME code section I and which requires ASME code stamping as specified in section I.

(7) "Certificate of competency" means a certificate issued to a boiler or pressure vessel inspector by the department.

(8) "Condemned" means a boiler or pressure vessel declared to be unsafe and which has an applied stamping designating its condemnation.

(9) "Department" means the department of industry, labor and human relations.

(10) "Enforcement authority" means the department.

(11) "External inspection" means an inspection made while the boiler or pressure vessel is in operation.

(12) "Fusion welding" means the melting together of filler metal and base metal, or of base metal only, which results in coalescence.

(13) "High temperature water boiler" means a boiler completely filled with water intended for operation at pressures in excess of 160 psig or temperatures in excess of 250° F.

(14) "Hot water heating boiler" means a boiler in which no steam is generated, from which hot water is circulated for heating purposes and then returned to the boiler, and which operates at a pressure not exceeding 160 psig or a temperature of 250° F at or near the boiler outlet.

(15) "Hot water storage tank" means a tank used to store water that is heated indirectly by a circulating water heater, by steam or hot water circulating through coils, or by other heat exchange methods internal or external to the tank.

(16) "Hot water supply boiler" means a boiler completely filled with water that furnishes hot water to be used externally to itself at pressures not exceeding 160 psig or at temperatures not exceeding 250° F at or near the boiler outlet.

(17) "Incompetence" means conduct which evidences a lack of ability to discharge the duty required to protect the health, safety and welfare of the public, lack of knowledge of the fundamental principles of inspection services or an inability to apply those principles, or failure to maintain competency in the current practices and methods applicable to inspection services and the rules of chs. ILHR 41 and 42.

(18) "Insurance company" means a company which has been licensed in this state to write boiler and pressure vessel insurance and which is actively engaged in writing such insurance for the general public.

(19) "Internal inspection" means an inspection made when the boiler or pressure vessel is shut down and handholes and manholes or other inspection openings are opened or removed for inspection of the interior as required by the inspector.

(20) "Low pressure boiler" means a boiler on which the safety valves are set at pressures not exceeding 15 psig.

(21) "Maximum allowable working pressure" means the maximum gage pressure permissible at the top of a completed vessel in its operating position for a designated temperature.

(22) "Miniature boiler" means a power boiler or high temperature water boiler which does not exceed any of the following limits:

- (a) 16 inches inside diameter of shell;
- (b) 20 square feet of heating surface, except for electric boilers;
- (c) 5 cubic feet gross volume exclusive of casing and insulation; and
- (d) 100 psig maximum allowable working pressure.

(23) "Misconduct" means an act performed in the discharge of enforcement duties which jeopardizes the interests of the public, including violation of federal or state laws, local ordinances or administrative rules relating to the position, preparation of deficient or falsified reports, failure to submit information or reports requested by the municipality or the department, conduct which evidences a lack of trustworthiness, misrepresentation of qualifications such as education, experience or certification, illegal entry of premises, misuse of funds, or misrepresentation of authority.

(24) "National board" means the national board of boiler and pressure vessel inspectors.

(25) "Negligence" means failure entirely by omission, commission or both to discharge the duty required of a reasonable person to protect the health, safety and welfare of the public.

(26) "Owner or user" means any person, firm or corporation legally responsible for the safe operation of a boiler or pressure vessel.

(27) "Portable boiler" means an internally fired boiler primarily intended for temporary location and whose construction and usage is of a movable nature.

(28) "Power boiler" means a boiler in which steam or other vapor is generated at a pressure of more than 15 psig.

(29) "Power piping" means any steam piping system beyond the scope of ASME code section I and having an operating pressure in excess of 15 psig, any hot water piping system beyond the scope of ASME code section I and subject to temperatures in excess of 250° F, or any piping system using an organic thermal fluid as a heat transfer media and subject to temperatures in excess of 250° F.

(30) "Pressure-temperature relief valve" means an automatic pressure relieving device actuated by the static pressure upstream of the valve which opens further with the increase in pressure over the opening pressure, or activated by the temperature of the fluid.

Note: A pressure-temperature relief valve is used primarily for liquid service.

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

(32) "Relief valve" means an automatic pressure relieving device actuated by the static pressure upstream of the valve which opens further with the increase in pressure over the opening pressure.

Note: A relief valve is used primarily for liquid service.

(33) "Repair" means work necessary to restore a boiler or pressure vessel to a safe operating condition.

(34) "Rupture disk" means a nonmechanical overpressure relief device that releases pressure when its preestablished rating is attained.

(35) "Safety relief valve" means an automatic pressure-actuated relieving device suitable for use either as a safety valve or relief valve, depending upon application.

(36) "Safety valve" means an automatic pressure relieving device actuated by the static pressure upstream of the valve and characterized by full-opening pop action.

Note: A safety valve is used for gas or vapor service.

(37) "Secondhand vessel" means a boiler or pressure vessel that has changed location subsequent to the original installation.

(38) "Water heater" means a closed vessel in which water is heated by the combustion of fuels, electricity or other energy source, and withdrawn for use external to the system at pressures not exceeding 160 psig, including the apparatus by which heat is generated and all controls and devices necessary to prevent water temperatures from exceeding 210° F.

Note: For further explanation of definitions, see the ASME code section VIII, scope and appendix 3.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88; am. (37), Register, February, 1990, No. 410, eff. 3-1-90; am. (29), Register, May, 1994, No. 461, eff. 6-1-94.

**ILHR 41.05 Petition for variance. (1) PROCEDURE.** The department shall consider and may grant a variance to an administrative rule upon receipt of a fee, a completed petition for variance form from the owner and, where applicable, a completed position statement from the chief of the local fire department, provided an equivalency is established in the petition for variance which meets the intent of the rule from which a variance is being petitioned. The department may impose specific conditions in the petition for variance to promote the protection of the health, safety and welfare of the employes or the public. Violation of those conditions under which the variance is granted constitutes a violation of chs. ILHR 41 and 42.

Note: The petition for variance application form (SBD-9890) is available from the Safety and Buildings Division, Customer Service Center, P.O. Box 7969, Madison, Wisconsin 53707, telephone 608/266-3151.

Note: Section 101.02(6), Stats., and ch. ILHR 3 outline the procedures for submitting petitions to the department and the department's procedures for hearing petitions.

Note: See ch. ILHR 2 for fee requirements.

**(2) PETITION PROCESSING TIME** Except for priority petitions, the department shall review and make a determination on a peti-

tion for variance within 30 business days of receipt of all calculations, documents and fees required to complete the review. The department shall process priority petitions within 10 business days of receipt of the required items.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.06 Penalties.** Penalties for violations of chs. ILHR 41 and 42 shall be assessed in accordance with s. 101.02, Stats.

Note: Section 101.02 (13) (a), Stats., indicates penalties will be assessed against any employer, employee, owner or other person who fails or refuses to perform any duty lawfully enjoined, within the time prescribed by the department, for which no penalty has been specifically provided, or who fails, neglects or refuses to comply with any lawful order made by the department, or any judgment or decree made by any court in connection with ss. 101.01 to 101.25, Stats. For each such violation, failure or refusal, such employee, owner or other person must forfeit and pay into the state treasury a sum not less than \$10 nor more than \$100 for each violation.

Note: Section 101.02 (12), Stats., indicates that every day during which any person, persons, corporation or any officer, agent or employee thereof, fails to observe and comply with an order of the department will constitute a separate and distinct violation of such order.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.07 Appeals. (1)** Appeal of local order. Any person affected by a local order which may be in conflict with a rule of the department may petition the department for a hearing on the grounds that the local order is unreasonable and in conflict with the rule of the department.

Note: Section 101.01 (1) (g), Stats., defines local order as any ordinance, order, rule or determination of any common council, board of alderperson, board of trustees or the village board, of any village or city, or the board of health of any municipality, or an order or direction of any official of such municipality, upon any matter over which the department has jurisdiction.

**(2) PETITION OF ADMINISTRATIVE RULE** Pursuant to s. 227.12, Stats., any municipality, corporation or any 5 or more persons having an interest in an administrative rule may petition the department requesting the adoption, amendment or repeal of that rule.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.08 Fees.** Fees for the inspection, certificate of operation and other services performed by the department pertaining to boilers and pressure vessels shall be submitted as specified in ch. ILHR 2. The owner shall be responsible for the payment of fees.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88; am. Register, December, 1992, No. 444, eff. 1-1-93.

**ILHR 41.10 Adoption of ASME standards. (1) CONSENT TO INCORPORATE** Pursuant to s. 227.21, Stats., consent has been granted by the attorney general and the revisor of statutes to incorporate by reference the rules contained in the standards and addenda listed in Table 41.10.

**(2) ADOPTION** The standards and addenda listed in Table 41.10 are hereby incorporated by reference into chs. ILHR 41 and 42.

TABLE 41.10

ASME Boiler and Pressure Vessel Code 1995 edition	
1. Section I	Power Boilers
2. Section II	Material Specifications
	a. Part A—Ferrous Material
	b. Part B—Nonferrous Material
	c. Part C—Welding Rods, Electrodes and Filler Metals
	d. Part D—Properties
3. Section III	Nuclear Power Plant Components
	a. Subsection NCA—General Requirements Division 1
	a. Subsection NB—Class 1 Components
	b. Subsection NC—Class 2 Components
	c. Subsection ND—Class 3 Components

d. Subsection NE—Class MC Components  
e. Subsection NF—Supports  
f. Subsection NG—Core Support Structures  
g. Appendices  
Division 2

a. Concrete Reactor Vessels and Containers

4. Section IV Heating Boilers

5. Section V Nondestructive Examination

6. Section VIII Pressure Vessels

a. Division 1—Pressure Vessels

b. Division 2—Alternative Rules

7. Section IX Welding and Brazing Qualifications

8. Section X Fiber—Reinforced Plastic Pressure Vessels

9. Section XI Inservice Inspection of Nuclear Power Plant Components

ANSI/ASME Standards

10. Power Piping, ANSI/ASME B31.1—1992 edition

**(3) FILING OF STANDARDS.** (a) Copies of the standards in reference are on file in the offices of the department, the secretary of state and the revisor of statutes.

(b) Copies may be on file at public and university libraries.

**(4) AVAILABILITY OF STANDARDS.** Copies of the standards in reference may be procured for personal use from the American Society of Mechanical Engineers (ASME) Order Department, 22 Law Drive, P.O. Box 2300, Fairfield, New Jersey 07007-2300.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88; r. and recr. Table 41.10, Register, February, 1990, No. 410, eff. 3-1-90; am. Table 41.10, Register, May, 1994, No. 461, eff. 6-1-94; am. Table 41.10, Register, June, 1996, No. 486, eff. 7-1-96.

## Subchapter II—Inspections

**ILHR 41.12 Inspector certifications required.** Any person performing an inspection and submitting an inspection report for the purpose of meeting inspection requirements covering a boiler or pressure vessel shall hold a valid certificate of competency or in-service field inspector authorization issued by the department.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.13 Certificate of competency as an inspector. (1) ELIGIBILITY.** An applicant for a certificate of competency as a boiler or pressure vessel inspector shall be an employee of the department, a municipality, an insurance company, or owners or operators of boilers and pressure vessels authorized to make their own inspections.

**(2) QUALIFICATIONS.** An applicant shall have one of the following combinations of education and experience requirements:

(a) A degree in engineering plus one year experience in design, construction, operation or inspection of high pressure boilers and pressure vessels; or

(b) An associate degree in mechanical technology plus 2 years experience in design, construction, operation or inspection of high pressure boilers and pressure vessels; or

(c) Three years experience in high pressure boiler and pressure vessel construction or repair, in supervision of high pressure boiler and pressure vessel operation, or in the inspection of high pressure boilers and pressure vessels.

**(3) APPLICATION.** (a) All applications for certification or recertification shall be made to the department together with the payment of the application and examination fees.

Note: Application form no. SB-37 is available from the Division of Safety and Buildings, P.O. Box 7969, Madison, Wisconsin 53707, telephone 608/266-3151.

Note: See ch. ILHR 2 for fee requirements.

(b) Upon receipt of the application form, the department shall review and evaluate the application and make all necessary notifications to the applicant.

(4) **ISSUANCE OF CERTIFICATE.** Certificates of competency for a boiler or pressure vessel inspector shall be issued by the department to eligible applicants who have received a grade of 70% or greater on the examination prescribed by and conducted by the department. The department shall issue the certificate within 15 business days of passage of the examination.

(a) The certificate shall bear the name of the applicant, certificate number and expiration date. The certificate shall be valid for the remainder of the calendar year in which it is issued.

(b) Applicants failing the examination may apply to retake the examination.

(c) Holders of certificates who do not apply for renewal in any 5-year period may be required to pass a scheduled examination.

(5) **RENEWAL OF CERTIFICATE.** Upon receipt of written notice of expiration, certification may be renewed. The request for renewal, together with the payment of the renewal fee, shall be filed with the department on or before January 1 of the calendar year for which the certificate is to be valid.

Note: See ch. ILHR 2 for fee requirements.

(6) **DENIAL OF CERTIFICATE.** (a) Upon denial of certification or recertification, the department shall notify the applicant within 15 business days in writing stating the reasons for denial. The notice of denial shall be made by certified mail sent to the address filed with the application. Service shall be verified by the certified mail receipt.

(b) Upon receipt of the notice of denial, the applicant may submit a written request for hearing. The right to hearing shall be waived if the applicant fails to submit the request within 30 business days of receipt of the notice of denial. Hearings shall be conducted by the department and the proceedings recorded.

(7) **SUSPENSION OR REVOCATION OF CERTIFICATION.** The department may suspend or revoke the certification of any inspector for:

(a) Fraud or deceit in obtaining certification;

(b) Any negligence, incompetence or misconduct in the discharge of the duties required under chs. ILHR 41 and 42; or

(c) Conviction of a criminal charge, misdemeanor or violation of a local regulation substantially related to the circumstances of the certified inspection activity or adjudication of mental incompetence by the courts.

(8) **SUSPENSION AND REVOCATION PROCEEDINGS.** (a) The department shall investigate alleged violations at its own initiative or upon the filing of a complaint. If it is determined that no further action is warranted, the department will notify the persons affected. If the department determines that there is probable cause for suspension, it shall order a hearing and notify, by mail, the persons affected.

(b) Upon receipt of hearing notice, the charged party may respond to the charges in writing. Failure to respond within 30 business days or failure to appear at the hearing may result in the charges being taken as true.

(c) All hearings shall be conducted by persons selected by the department.

(d) Any findings shall be in writing and shall be binding unless appealed to the secretary of the department.

(e) All arguments shall be submitted in writing.

(9) **RECIPROCITY.** A certificate of competency may be granted by the department to a boiler or pressure vessel inspector who holds a certificate issued by the national board of boiler and pressure vessel inspectors and a certificate of competency from a city or state which has adopted the ASME boiler and pressure vessel code and which requires a written examination similar to that required by the department.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.14 In-service field inspectors.** (1) **ELIGIBILITY.** An applicant for an in-service field inspector authorization shall be an employe of the department, a municipality, an insurance company, or owners or operators of boilers and pressure vessels authorized to make their own inspections.

(2) **QUALIFICATIONS.** An applicant shall have one of the following education and experience qualifications:

(a) A bachelor's degree in engineering from an accredited college or university, which is deemed to be the equivalent of 2 years experience in design, construction, operation or inspection of high pressure boilers and pressure vessels; or

(b) An associate degree in mechanical technology plus one year of actual experience in design, construction, operation or inspection of high pressure boilers and pressure vessels; or

(c) Two years of practical experience in the construction, installation, repair, maintenance, operation or inspection of high pressure boilers and pressure vessels.

(3) **APPLICATION.** (a) All applications for an in-service field inspector authorization shall be made to the department together with the payment of the application and examination fees.

Note: Application form no. SB-37 is available from the Division of Safety and Buildings, P.O. Box 7969, Madison, Wisconsin 53707 - telephone 608/266-3151.

Note: See ch. ILHR 2 for fee requirements.

(b) Upon receipt of the application form, the department shall review and evaluate the application and make all necessary notifications to the applicant.

(4) **ISSUANCE OF AUTHORIZATION.** In-service field inspector authorizations shall be issued by the department to eligible applicants who have received a grade of 70% or greater on the examination prescribed by and conducted by the department. The department shall issue the authorization within 15 business days of passage of the examination.

(a) The authorization shall bear the name of the applicant, authorization number and expiration date. The authorization shall be valid for a period of 15 months from the date of issuance.

(b) Applicants failing the examination may apply to retake the examination.

(c) The authorization shall be nonrenewable.

(5) **INSPECTION WORK.** (a) The in-service field inspector authorization may be utilized by the holder only while in the continuous employ of the authorized inspection agency by whom employed at the time of application.

(b) The authorized in-service field inspector may perform only field inspection work and the work shall be performed while accompanied by an authorized field inspector during the first 3 months of employment and under the direct supervision of an authorized field inspector for the following 12 months.

(c) If the authorized inspection agency specified in par. (a) is an insurance company, then the authorized in-service field inspector may perform field inspection work only upon objects covered by the insurance company.

(d) Inspection of repairs and alterations shall be performed by an authorized inspector in possession of a certificate of competency.

(6) **APPLICATION FOR CERTIFICATE OF COMPETENCY.** Upon completion of one year of experience as an authorized in-service field inspector while in the continuous employ of the authorized inspection agency by whom employed at the time of application, the holder of a valid authorization, through the employer, may apply for a certificate of competency. In the event the applicant's experience is with more than one authorized inspection agency, the department may accept the accumulated inspection experience.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.15 General inspection requirements.**

(1) **ALL INSPECTIONS.** The authorized inspectors of the depart-

ment, upon presenting appropriate credentials to the owner, operator, or agent in charge, may:

(a) Enter without delay and at reasonable times any factory, plant, establishment, construction site, or other area, workplace or environment where work is performed by an employe of an employer; and

(b) Inspect and investigate during regular working hours and at other reasonable times, and within reasonable limits and in a reasonable manner, any place of employment and all pertinent conditions, structures, machines, apparatus, devices, equipment, and materials therein, and to question privately any employer, owner, operator, agent or employe.

(2) REPRESENTATION. The inspector, before making an inspection, shall contact the employer or employer's representative who shall be given an opportunity to accompany the inspector during the physical inspection of any workplace under sub. (1).

Note: The department procedure is not to give advance notice, but in the scheduling and in the act of inspecting it may not always be possible to avoid advance notice or to obtain accompaniment, but otherwise these rules will be diligently observed.

History: Cr Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.16 Initial inspections.** (1) BOILER AND PRESSURE VESSEL INSPECTIONS. (a) Except as provided in par. (b), boilers and pressure vessels shall be inspected by an authorized inspector before they are placed in operation.

Note: See s. ILHR 41.41 for installation registration requirements.

(b) The inspections specified in par. (a) are not required for boilers and pressure vessels exempted from periodic inspections in s. ILHR 41.18.

(c) Where the boilers or pressure vessels specified in par. (a) are installed in a city of the first class and inspections are made by the city, the city shall keep a record of the inspections and shall submit a copy to the department.

(d) Where the inspections specified in par. (a) are performed by an authorized inspector other than a department inspector, the authorized inspector shall file an inspection report with the department and shall affix the Wisconsin registration number as required in s. ILHR 41.36. The inspection report shall be filed with the department within 30 calendar days after completion of the boiler or pressure vessel installation. If the report is not filed within the 30-day period, the department shall perform the inspection.

(e) Required initial inspections shall be reported to the department on forms SBD-7678 and SBD-7679.

Note: Form SBD-7678 is used for reporting inspections of pressure vessels, and Form SBD-7679 is used for reporting inspections of boilers. See Appendix A for copies of these forms.

(2) POWER PIPING INSPECTIONS. (a) Except as provided in par. (b), all power piping systems not covered by ASME code section I and required to be constructed in accordance with the ANSI standard for power piping as listed in Table 41.10, shall receive an initial inspection by an authorized inspector employed by the department or, if installed in a city of the first class, by the city. Documented inspections, including the initial inspection, made by authorized inspectors not employed by the department shall be acceptable to the department.

(b) The inspections specified in par. (a) are not required for:

1. Power piping of 2 inches nominal pipe size and smaller;
2. Power piping replacements, modifications and alterations to existing systems and for new installations, any of which do not exceed 50 feet in length; and
3. Underground power piping systems which are not located in a walk-in tunnel.

(c) The installer shall notify the department, the city of the first class or the authorized inspector employed by an insurance company prior to the start of construction of the power piping system so that inspections may be arranged. The department or the city shall be given a minimum of 2 business days notice to arrange for inspection.

(d) A power piping inspection shall be made after the piping material is delivered to the job site and prior to the start of construction of the power piping system. The installer shall complete form SBD-5204 and retain it at the job site prior to the power piping inspection. The authorized inspector shall indicate acceptance of the power piping system design by signing form SBD-5204. Power piping systems may not be insulated or placed in service without receiving an inspection.

Note: See Appendix A for a copy of form SBD-5204.

(e) Prefabricated piping that is part of a power piping system shall be inspected by an authorized inspector at the fabrication shop. The shop fabricator shall provide a copy of the authorized inspector's report to the installer at the job site verifying that the prefabricated piping complies with the ANSI standard for power piping adopted under s. ILHR 41.10.

(f) The owner of the power piping system may request power piping inspections in addition to the minimum inspections.

(g) Inspection fees for the power piping inspections shall be assessed by the department or by the city of the first class.

Note: For inspection fees, see ch. ILHR 2.

History: Cr Register, February, 1988, No. 386, eff. 3-1-88; am. (1) (d) and (2) (c), cr. (1) (e), Register, December, 1992, No. 444, eff. 1-1-93; am. (2) (d), r. and recr. (2) (e), Register, May, 1994, No. 461, eff. 6-1-94.

**ILHR 41.17 Periodic inspections.** (1) INSPECTION OF POWER BOILERS. (a) Except as provided in s. ILHR 41.18, power boilers and organic fluid heat transfer boilers shall be subjected to either a regular internal or external inspection at least once every 12 months by an authorized inspector.

(b) Where an internal inspection of a power boiler is not possible because of the construction of the boiler, an external inspection shall be acceptable.

(2) INSPECTION OF PRESSURE VESSELS. Except as provided in s. ILHR 41.18, pressure vessels shall be subjected to a regular internal or external inspection at least once every 36 months by an authorized inspector.

(3) INSPECTION OF LOW PRESSURE STEAM AND HOT WATER HEATING BOILERS. Except as provided in s. ILHR 41.18, low pressure steam boilers and hot water heating boilers shall be subjected to a regular internal or external inspection at least once every 36 months by an authorized inspector.

(4) INSPECTION OF SAFETY VALVES AND SAFETY RELIEF VALVES. The authorized inspectors shall satisfy themselves that safety valves and safety relief valves have been operated at least once every 12 months.

(5) EXTENSION OF PERIOD BETWEEN INSPECTIONS. If operating conditions require, an extension of periods not to exceed 6 months between inspections of boilers, pressure vessels, safety valves and safety relief valves may be approved by the department upon a written request from the owner or user for an extension. The authorized inspection agency shall concur with the owner's or user's request for extension by letter to the department.

Note: For inspection fees, see ch. ILHR 2.

History: Cr Register, February, 1988, No. 386, eff. 3-1-88; am. (1) (a), Register, December, 1992, No. 444, eff. 1-1-93; am. (5) Register, May, 1994, No. 461, eff. 6-1-94.

**ILHR 41.18 Exemptions from periodic inspections.**

(1) EXEMPTED EQUIPMENT. Except as provided in sub. (2), periodic inspections are not required for:

- (a) Boilers or pressure vessels which receive regular inspections by United States government inspectors;
- (b) Heating boilers located in private residences or in apartment buildings having less than 3 living units;
- (c) Expansion tanks for hot water heating boilers;
- (d) Boilers used exclusively for agricultural purposes;
- (e) Pressure vessels having an inside diameter not exceeding 6 inches with no limit on pressure;

(f) Pressure vessels having a volume of less than 5 cubic feet and an operating pressure of less than 250 psig;

(g) Pressure vessels with a volume of less than 1-1/2 cubic feet with no limit on pressure;

(h) Pressure vessels having an internal or external operating pressure of not more than 15 psig with no limitations on size;

(i) Hot water supply boilers and water heaters, and hot water storage tanks in which the temperature does not exceed 210° F;

(j) Vessels used for the storage or processing of cold water, including those with air cushions;

(k) Pressure vessels which are used in accordance with the regulations of the United States department of transportation;

(L) Air receivers having a volume of less than 12 cubic feet and an operating pressure of less than 250 psig; and

(m) Pressure vessels used in processing and storing of fermented beverages at temperatures not exceeding 140° F

**(2) EXCEPTIONS.** In individual cases, the boilers and pressure vessels exempted in sub. (1) shall be subject to inspection by or on order of the department upon the complaint of any person or upon the initiative of the department when there is reasonable cause to suspect that the construction, installation, maintenance or operation of the vessel is not in keeping with the general purpose and intent of chs. ILHR 41 and 42.

**(3) EXEMPTED POWER BOILERS.** A power boiler, excluding a chemical recovery boiler, with a rated steam output capacity of 100,000 pounds per hour or greater may be exempted from internal inspection each 12 months, but not to exceed 24 months, provided all the following conditions are met:

(a) A documented boiler maintenance program is available.

(b) A documented boiler water treatment program is available.

(c) The inspection agency of record has verified in writing to the department that the maintenance and treatment programs are adequate for the boiler.

(d) If the internal inspection is completed during the 12 to 24 month period, the boiler shall be subjected to an external inspection at 12 months.

History: Register, February, 1988, No. 386, eff. 3-1-88; cr. (3), Register, June, 1996, No. 486, eff. 7-1-96

#### ILHR 41.19 Preparation for internal inspection.

**(1) GENERAL REQUIREMENTS.** The owner or user of a boiler or a pressure vessel subject to inspection shall prepare the vessel for internal inspection after due notice from the inspector. To prepare a vessel for an internal inspection all manhole plates, all wash-out plugs, and a sufficient number of handhole plates to permit a satisfactory inspection shall be removed. The shell and heads shall be thoroughly cleaned and exposed when so requested. Each steam boiler shall be thoroughly drained of water and all fire side surfaces cleaned before an internal inspection is made.

**(2) PREPARATION PROCEDURE.** The following procedure shall be required for preparation for inspection:

(a) Before entering any part of a boiler which is connected to a common header with other boilers, the required steam or water system stop valves shall be closed, tagged and preferably padlocked, and drain valves or cocks between the 2 closed stop valves shall be opened. The feed valves shall be closed, tagged, and preferably padlocked, and drain valves or cocks located between the 2 valves shall be opened.

(b) After draining the boiler, the blowoff valves shall be closed, tagged and preferably padlocked. Blowoff lines, where practicable, shall be disconnected between pressure parts and valves. All drains and vent lines shall be opened.

**(3) RIGHT TO REFUSE ENTRY.** The authorized inspector shall have the right to refuse to enter a boiler or pressure vessel if in the inspector's judgement it is unsafe to do so.

Note: Confined space rules are contained in ch. ILHR 32 for public sector employees and in section 29 CFR 1910.146 of the federal Occupational Safety and Health Administration for private sector employees

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88

#### ILHR 41.20 Inspections by insurance companies.

Inspections of boilers and pressure vessels by insurance companies may be accepted by the department under the following conditions:

**(1) AUTHORITY.** The boiler and pressure vessel inspectors employed by the insurance company shall hold certificates of competency or in-service field inspector authorizations issued by the department.

**(2) REPORTS.** The insurance company shall report inspections of boilers and pressure vessels to the department as required in s. ILHR 41.23.

**(3) PROCEDURES.** The inspection procedures used by the insurance company shall conform to the regulations of chs. ILHR 41 and 42.

**(4) COVERAGE.** The insurance company shall report to the department within 30 calendar days when insurance coverage is started or discontinued on a boiler or pressure vessel. The reason for discontinuing the coverage shall be given on the report. If the boiler or pressure vessel is installed in a city of the first class which provides boiler and pressure vessel inspections, the report shall also be provided to the city.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.21 Inspections by cities.** Inspections of boilers and pressure vessels by cities of the first class may be accepted by the department under the following conditions:

**(1) AUTHORITY.** The boiler and pressure vessel inspectors employed by the city shall hold certificates of competency or in-service field inspector authorizations issued by the department.

**(2) REPORTS.** The city shall keep a record of the inspections and shall submit a copy to the department.

**(3) PROCEDURES.** The inspection procedures used by the city shall conform to the regulations of chs. ILHR 41 and 42.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.22 Inspections by companies or corporations.** Inspections by companies or corporations of boilers or pressure vessels which they own or operate may be accepted by the department under the following conditions:

**(1) AUTHORITY.** The boiler and pressure vessel inspectors employed by the company or corporation shall hold certificates of competency or in-service field inspector authorizations issued by the department.

**(2) REPORTS.** The company or corporation shall report inspections of boilers and pressure vessels to the department as required in s. ILHR 41.23.

**(3) PROCEDURES.** The inspection procedures used by the company or corporation shall conform to the regulations of chs. ILHR 41 and 42.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

#### ILHR 41.23 Reporting of periodic inspections.

**(1) REPORTING PROCESSING TIME.** Reports of periodic internal or external inspections of boilers and pressure vessels shall be sent to the department within 30 calendar days from the date of inspection.

**(2) INSPECTION REPORT FORMS.** (a) Required periodic inspections shall be reported to the department on forms SBD-7678 and SBD-7679.

Note: Form SBD-7678 is used for reporting inspections of pressure vessels, and Form SBD-7679 is used for reporting inspections of boilers. See Appendix A for copies of these forms.

(b) A group of pressure vessels of the same design and use that are interconnected or are operated so as to form a unit, machine



or apparatus may be included in a single inspection report. The report shall contain the number, description and use of the vessel.

(c) The inspection report shall explain any violation or unsafe condition with references to code section numbers. Recommendations to the owner or user of the vessel, relating to code violations, shall be included in the report to the department.

(d) The inspection report shall be legible and complete.

(3) **EXTERNAL INSPECTIONS.** External inspections shall be reported only when either of the following conditions is found:

(a) An internal inspection is not possible because of the construction of the vessel. In these cases the external inspection shall be reported to the department in the same manner as an internal inspection. The report shall be marked external and the reason for making an external inspection instead of an internal shall be given; or

(b) When violations of chs. ILHR 41 and 42 or unsafe conditions involving the safety of the vessel are found.

History: Cr Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.24 Certificate of operation. (1) RESPONSIBILITY.** (a) The owner or user of the boiler or pressure vessel shall be responsible for obtaining and maintaining a valid certificate of operation.

(b) The certificate of operation shall be posted on the premises by the owner or user of the boiler or pressure vessel.

Note: See Appendix A for a copy of the certificate of operation.

(2) **ISSUANCE.** After each initial or periodic inspection for boilers and pressure vessels found to be in compliance with chs. ILHR 41 and 42, a certificate of operation shall be issued by the department to the owner or user of the boiler or pressure vessel. The department shall issue the certificate within 15 business days of determination of compliance.

(3) **ALLOWABLE PRESSURE.** The certificate of operation shall give the maximum allowable working pressure as determined using the regulations of chs. ILHR 41 and 42.

(4) **EXPIRATION.** The certificate of operation shall be valid until the next required periodic inspection.

History: Cr Register, February, 1988, No. 386, eff. 3-1-88.

### Subchapter III—All Installations

**ILHR 41.27 Application.** The provisions of ss. ILHR 41.27 to 41.39 shall apply to all boilers and pressure vessels existing prior to, or installed after March 1, 1988.

History: Cr Register, February, 1988, No. 386, eff. 3-1-88; correction made under s.13.93 (2m) (b) 14, Stats., Register, May, 1994, No. 461.

**ILHR 41.28 Safety rules. (1) MAXIMUM ALLOWABLE WORKING PRESSURE.** No boiler or pressure vessel may be operated at a pressure in excess of the maximum allowable working pressure stated on its current certificate of operation.

(2) **ALTERATION TO SAFETY DEVICES.** No unauthorized person may remove or tamper with any connected safety device.

(3) **INSTALLATION LOCATION.** Boilers and pressure vessels shall be so installed that there will be sufficient room between the vessel and any ceiling, wall, partition or floor to facilitate the connection and operation of valves, pipes and other appurtenances, and shall be installed in a manner that will not block any inspection opening.

Note: To assure proper installation, alteration or repair of a boiler or pressure vessel, it may be necessary to comply with other applicable Wisconsin Administrative Code sections in addition to the Wisconsin Boiler and Pressure Vessel Code. Some of the Wisconsin Administrative Code sections to be considered are as follows:

Sections ILHR 54.14, 55.29, 56.15, 57.14, 58.24, 58.62, 59.21, 60.25, 60.37, 61.24, 62.32 and 62.78 (boiler room requirements).  
Section ILHR 64.09 (combustion air intake requirements).  
Sections ILHR 64.20 to 64.23 (installation and safety control requirements).  
Sections ILHR 64.45 to 64.50 (chimney and smokestack requirements).  
Section ILHR 64.51 (equipment location and protection requirements).

Wisconsin Administrative Codes may be obtained by contacting the State Department of Administration, Document Sales and Distribution, P.O. Box 7840, Mason, Wisconsin 53707.

History: Cr Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.29 Safety controls. (1) GENERAL.** Oil-fired, gas-fired and electrically-heated boilers shall be equipped with primary safety controls, safety limit switches, and burners or electric elements that bear the stamp, monogram or other evidence of compliance with a nationally recognized standard.

Note: Typical acceptable stamps are the American Gas Association (AGA) and the Underwriters Laboratories (UL).

(2) **PRESSURE AND TEMPERATURE CONTROLS.** Compliance with the following requirements is optional for boilers installed prior to January 1, 1957:

(a) **Pressure controls.** Each automatically-fired steam boiler or system of commonly connected steam boilers shall have at least one steam pressure control device that will shut off the fuel supply to each boiler or system of commonly connected boilers when the steam pressure reaches a preset maximum operating pressure. In addition to the operating pressure control, each individual automatically-fired steam boiler shall have a high steam pressure limit control that will prevent generation of steam pressure in excess of the maximum allowable working pressure. Each limit control and operating control shall be clearly separated, and have its own sensing element and operating switch. No shut-off valve of any type may be placed in the steam pressure connection between the boiler and the high pressure limit control device.

(b) **Temperature controls.** Each automatically-fired hot water boiler or system of commonly connected hot water 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 operating temperature control, each individual automatically-fired hot water boiler unit shall have a high temperature limit control that will prevent the water temperature from exceeding the maximum allowable temperature. Each limit control and operating control shall be clearly separated, and have its own sensing element and operating switch.

History: Cr Register, February, 1988, No. 386, eff. 3-1-88; am. (2) (a), Register, June, 1996, No. 486, eff. 7-1-96.

### ILHR 41.30 Low-water cutoff and water feeder.

(1) **GENERAL REQUIREMENTS.** (a) Every automatically-fired power boiler which does not have a full-time attendant and every automatically-fired low-pressure steam boiler shall be equipped with an automatic low-water fuel cutoff or other device which will perform a similar function, so located as to automatically cut off the fuel supply when the surface of the water falls to the lowest safe water line.

(b) If a water-feeding device is installed, it shall be so constructed that the water inlet valve cannot feed water into the boiler through the float chamber and so located as to supply requisite feed water. The lowest safe water line shall be not lower than the lowest visible part of the water glass.

(c) Boilers which are manually fired and have a residual heat source shall have a fusible plug installed which will extinguish the fire in the event of low water.

(2) **BOWL DESIGNS.** Designs embodying a float and float bowl, or probe control installed in a bowl or chamber externally to the boiler, shall have a vertical straightway valved drain pipe at the lowest point in the water equalizing pipe connections by which the bowl or chamber and the equalizing pipe can be flushed and the device tested.

History: Cr Register, February, 1988, No. 386, eff. 3-1-88; cr. (1) (c), Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.31 Boiler blowoff equipment. (1) PRESSURE-TEMPERATURE LIMITS.** The blowdown from a boiler that enters a sewer system or blowdown which is considered a hazard to life or property shall pass through some form of blowoff equipment that

will reduce pressure and temperature as specified in pars. (a) and (b).

(a) The temperature of the water leaving the blowoff equipment may not exceed 140° F.

(b) The pressure of the blowdown leaving the blowoff equipment may not exceed 5 psi.

(2) **PIPING AND FITTINGS.** The blowoff piping and fittings between the boiler and the blowoff tank shall comply with the ANSI standard listed in Table 41.10 or the code in effect at the time of construction.

(3) **TANKS AND SEPARATORS.** The blowoff tank or separator shall be designed in accordance with s. ILHR 41.42 or the code in effect at the time of construction for a maximum allowable working pressure of at least 50 psig.

(4) **GENERAL REQUIREMENTS.** All blowoff equipment, except centrifugal blowdown separators, shall be fitted with openings to facilitate cleaning and inspection and shall have:

(a) A pressure gage graduated from 0–50 psi;

(b) A thermometer well located near the water outlet connection and in contact with the retained water in the tank;

(c) A gauge glass at least ½-inch in diameter with the lower connection to the glass at a point about 6 inches below the water line and the upper connection at a point about 6 inches above the water line;

(d) A drain connection of at least 2-inch standard pipe size; and

(e) Connections designed so that freezing will not close the inlet, the outlet or the vent.

(5) **VENT PIPING.** All blowoff equipment shall have vent piping, full size, piped to the outside atmosphere and discharged to a safe location.

**Note:** Blowoff equipment designed in accordance with the boiler blowoff equipment rules issued by the National Board of Boiler and Pressure Vessel Inspectors will meet the requirements of this section. Other methods of designing blowoff equipment may be used if approved by the department.

**History:** Cr. Register, February, 1988, No. 386, eff. 3-1-88; am. (4) (d) and (e), r. (4)(f), cr. (5), Register, December, 1992, No. 444, eff. 1-1-93; am. (2), (3), (4) (a), Register, June, 1996, No. 486, eff. 7-1-96.

### ILHR 41.32 Pressure gages for air receivers.

(1) **GAGE LOCATION.** Air receivers shall be equipped with an indicating pressure gage so located as to be readily visible.

(2) **GAGE DIAL.** The dial of the pressure gage shall be graduated to approximately double the pressure at which the safety valve is set, but may not be less than one and one-half times that pressure.

**History:** Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.33 Protection of vessels supplied through pressure reducing stations.** The following requirements shall be used for determining the sizes of safety valves on pressure vessels such as, but not limited to pressure cookers, indirect hot water heaters and equipment in heating systems, which are supplied through pressure reducing stations from boilers carrying a higher steam pressure. Where a pressure reducing station is supplied from a boiler, the capacity of the safety valves on the low pressure side of the system need not exceed the capacity of the boiler.

(1) **REDUCING STATION CAPACITY.** The following formula shall be used to determine the steam flow rate through the pressure reducing station.

$$W = 1/3 \times OC \times VSPA$$

Where:

W= steam flow in pounds of steam per hour through the pressure reducing valve

OC= orifice capacity in pounds of steam per hour per square inch from Table 41.33-1

VSPA= reducing valve size pipe area in square inches from Table 41.33-2

(a) The critical flow capacity data supplied by the reducing valve manufacturer may be used in place of the above formula to select the required safety valve capacity. The capacity calculations shall be the largest obtainable by internal trim change of the reducing valve.

(b) In using Table 41.33-1, the pressure reducing station inlet pressure is the lowest set pressure of any safety valve on the high pressure side of the pressure reducing station.

(2) **BYPASS CAPACITY.** The following formula shall be used to determine the steam flow rate through the bypass when pressure reducing stations are arranged with a valved bypass which also acts as a potential steam source hazard in case the bypass is left open.

$$W = 1/2 \times OC \times BPA$$

Where:

W= steam flow in pounds of steam per hour through the bypass valve

OC= orifice capacity in pounds of steam per hour per square inch from Table 41.33-1

BPA= bypass pipe area in square inches from Table 41.33-2

(3) **SELECTING SAFETY VALVE.** The larger of the steam flow rates calculated by the formulas in subs. (1) and (2) shall be used for selecting the safety valve on the low pressure side of the system.



TABLE 41.33-1  
ORIFICE RELIEVING CAPACITIES  
(Pounds per hour per square inch)

OUTLET PRESSURE PSIG	PRESSURE REDUCING VALVE INLET PRESSURE, PSIG											
	1500	1450	1400	1350	1300	1250	1200	1150	1100	1050	1000	950
1000	76560	72970	69170	64950	60540	55570	49930	43930	35230	25500	—	—
950	77430	74180	70760	67000	63100	58770	53920	48610	42380	34890	24910	—
900	77750	74810	71720	68340	64870	61040	56820	52260	47050	41050	33490	23960
850	77830	74950	72160	69130	66020	62610	58900	54930	50480	45470	39660	29080
800	—	75070	72330	69490	66700	63680	60390	56910	53060	48800	43980	38340
750	—	—	—	69610	66880	64270	61260	58200	54840	51170	47080	42420
700	—	—	—	—	66900	64270	61520	58820	55870	52670	49170	45230
650	—	—	—	—	—	—	61550	58860	56260	53480	50440	47070
600	—	—	—	—	—	—	—	58980	56270	53660	51020	48470
550	—	—	—	—	—	—	—	—	—	53810	51040	48470
500	—	—	—	—	—	—	—	—	—	—	—	—
450	—	—	—	—	—	—	—	—	—	—	—	—
400	—	—	—	—	—	—	—	—	—	—	—	—
350	—	—	—	—	—	—	—	—	—	—	—	—
300	—	—	—	—	—	—	—	—	—	—	—	—
250	—	—	—	—	—	—	—	—	—	—	—	—
200	—	—	—	—	—	—	—	—	—	—	—	—
175	—	—	—	—	—	—	—	—	—	—	—	—
150	—	—	—	—	—	—	—	—	—	—	—	—
125	—	—	—	—	—	—	—	—	—	—	—	—
110	—	—	—	—	—	—	—	—	—	—	—	—
100	—	—	—	—	—	—	—	—	—	—	—	—
85	—	—	—	—	—	—	—	—	—	—	—	—
75	—	—	—	—	—	—	—	—	—	—	—	—
60	—	—	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	—	—	—	—	—	—	—
40	—	—	—	—	—	—	—	—	—	—	—	—
30	—	—	—	—	—	—	—	—	—	—	—	—
25	—	—	—	—	—	—	—	—	—	—	—	—
15	—	—	—	—	—	—	—	—	—	—	—	—
10	—	—	—	—	—	—	—	—	—	—	—	—
5	—	—	—	—	—	—	—	—	—	—	—	—

Where capacities are not shown for inlet and outlet conditions, use the highest capacity shown under the applicable inlet pressure column.

TABLE 41.33-1 (continued)  
ORIFICE RELIEVING CAPACITIES  
(Pounds per hour per square inch)

OUTLET PRES. PSIG	PRESSURE REDUCING VALVE INLET PRESSURE, PSIG												
	900	850	800	750	700	650	600	550	500	450	400	350	300
1000	---	---	---	---	---	---	---	---	---	---	---	---	---
950	---	---	---	---	---	---	---	---	---	---	---	---	---
900	---	---	---	---	---	---	---	---	---	---	---	---	---
850	23190	---	---	---	---	---	---	---	---	---	---	---	---
800	31610	22550	---	---	---	---	---	---	---	---	---	---	---
750	37110	30600	21800	---	---	---	---	---	---	---	---	---	---
700	40860	35730	29420	21020	---	---	---	---	---	---	---	---	---
650	43400	39200	34250	28260	20190	---	---	---	---	---	---	---	---
600	45010	41500	37470	32800	27090	19480	---	---	---	---	---	---	---
550	45800	42840	39850	35730	31310	25940	18620	---	---	---	---	---	---
500	45850	43330	40530	37610	33880	29760	24630	17720	---	---	---	---	---
450	45870	43330	40730	38150	35260	31980	28080	23290	16680	---	---	---	---
400	---	---	40760	38220	35680	33050	29980	26380	21870	15760	---	---	---
350	---	---	---	---	---	33120	30690	27910	24570	20460	14790	---	---
300	---	---	---	---	---	33240	---	28140	25610	22620	18860	13630	---
250	---	---	---	---	---	---	---	28150	25650	23200	21000	17100	10800
200	---	---	---	---	---	---	---	---	---	---	21350	18250	15350
175	---	---	---	---	---	---	---	---	---	---	---	18250	16000
150	---	---	---	---	---	---	---	---	---	---	---	18250	16200
125	---	---	---	---	---	---	---	---	---	---	---	18780	---
110	---	---	---	---	---	---	---	---	---	---	---	---	---
100	---	---	---	---	---	---	---	---	---	---	---	---	---
85	---	---	---	---	---	---	---	---	---	---	---	---	---
75	---	---	---	---	---	---	---	---	---	---	---	---	---
60	---	---	---	---	---	---	---	---	---	---	---	---	---
50	---	---	---	---	---	---	---	---	---	---	---	---	---
40	---	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---	---

Where capacities are not shown for inlet and outlet conditions, use the highest capacity shown under the applicable inlet pressure column.

TABLE 41.33-1 (continued)  
ORIFICE RELIEVING CAPACITIES  
(Pounds per hour per square inch)

OUTLET PRES, PSIG	PRESSURE REDUCING VALVE INLET PRESSURE, PSIG												
	250	200	175	150	125	100	85	75	60	50	40	30	25
1000	—	—	—	—	—	—	—	—	—	—	—	—	—
950	—	—	—	—	—	—	—	—	—	—	—	—	—
900	—	—	—	—	—	—	—	—	—	—	—	—	—
850	—	—	—	—	—	—	—	—	—	—	—	—	—
800	—	—	—	—	—	—	—	—	—	—	—	—	—
750	—	—	—	—	—	—	—	—	—	—	—	—	—
700	—	—	—	—	—	—	—	—	—	—	—	—	—
650	—	—	—	—	—	—	—	—	—	—	—	—	—
600	—	—	—	—	—	—	—	—	—	—	—	—	—
550	—	—	—	—	—	—	—	—	—	—	—	—	—
500	—	—	—	—	—	—	—	—	—	—	—	—	—
450	—	—	—	—	—	—	—	—	—	—	—	—	—
400	—	—	—	—	—	—	—	—	—	—	—	—	—
350	—	—	—	—	—	—	—	—	—	—	—	—	—
300	—	—	—	—	—	—	—	—	—	—	—	—	—
250	—	—	—	—	—	—	—	—	—	—	—	—	—
200	10900	—	—	—	—	—	—	—	—	—	—	—	—
175	12600	7250	—	—	—	—	—	—	—	—	—	—	—
150	13400	9540	6750	—	—	—	—	—	—	—	—	—	—
125	13600	10800	8780	6220	—	—	—	—	—	—	—	—	—
110	13600	11000	9460	7420	4550	—	—	—	—	—	—	—	—
100	13600	11000	9760	7970	5630	—	—	—	—	—	—	—	—
85	13600	11000	—	8480	6640	4070	—	—	—	—	—	—	—
75	13600	11000	—	—	7050	4980	3150	—	—	—	—	—	—
60	13630	11000	—	—	7200	5750	4540	3520	—	—	—	—	—
50	—	11000	—	—	—	5920	5000	4230	2680	—	—	—	—
40	—	11000	—	—	—	—	5140	4630	3480	2470	—	—	—
30	—	11050	—	—	—	—	—	—	3860	3140	2210	—	—
25	—	—	—	—	—	—	—	—	—	3340	2580	1485	—
15	—	—	—	—	—	—	—	—	—	—	2830	2320	1800
10	—	—	—	—	—	—	—	—	—	—	—	—	2060
5	—	—	—	—	—	—	—	—	—	—	—	—	—

Where capacities are not shown for inlet and outlet conditions, use the highest capacity shown under the applicable inlet pressure column.

**TABLE 41.33-2  
INTERNAL PIPE AREA**

Nominal pipe size, inches	STANDARD WEIGHT PIPE		
	Actual External Diameter, Inches	Approx. Internal Diameter, Inches	Approx. Internal Area, Square Inches
3/8	0.675	0.49	0.19
1/2	0.840	0.62	0.30
3/4	1.050	0.82	0.53
1	1.315	1.05	0.86
1-1/4	1.660	1.38	1.50
1-1/2	1.900	1.61	2.04
2	2.375	2.07	3.36
2-1/2	2.875	2.47	4.78
3	3.5	3.07	7.39
3-1/2	4.0	3.55	9.89
4	4.5	4.03	12.73
5	5.563	5.05	19.99
6	6.625	6.07	28.89
8	8.625	8.07	51.15
10	1.750	10.19	81.55
12	12.750	12.09	114.80

Note: In applying Table 41.33-2, the area of the pipe is always based upon standard weight pipe and the inlet size of the pressure reducing valve.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88; am. intro., (1)(intro.), (2), r. and recr. (1) (a) and (b), Register, May, 1994, No. 461, eff. 6-1-94; am. (1) (a), Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.34 Portable boilers. (1) CERTIFICATE REQUIRED.** The owner or user of a portable boiler located in Wisconsin or brought into Wisconsin for use, shall possess a certificate of operation issued by the department prior to use.

**(2) BOILER REQUIREMENTS.** The certificate of operation shall be issued only after the following requirements are met:

- (a) The boiler is of ASME construction;
- (b) The boiler is installed according to the applicable requirements of chs. ILHR 41 and 42; and
- (c) An internal or external inspection of the boiler has been made which is acceptable to the department.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.35 Interconnected boilers.** When boilers of different maximum allowable working pressures with minimum safety valve settings varying more than 6% are so connected that steam can flow toward the lower pressure units, the latter shall be protected by additional safety valve capacity, if necessary, on the lower pressure side of the system. The additional safety valve capacity shall be based upon the maximum amount of steam which can flow into the lower pressure system. The additional safety valves shall have at least one valve set at a pressure not to exceed the lowest allowable pressure and the other valves shall be set within a range not to exceed 3% above that pressure.

History: History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.36 Identification of boilers and pressure vessels. (1) PERMANENT NUMBER.** The owner or user of a boiler or pressure vessel shall number each vessel in some permanent manner and in an accessible location.

**(2) REGISTRATION NUMBER.** Boilers and pressure vessels subject to periodic inspections shall be identified by a registration number supplied by the department. The registration number shall be affixed to the vessel by an authorized inspector at a location which can be easily viewed.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.37 Maintenance. (1) CORROSION PREVENTION.** All boilers and pressure vessels shall be installed and maintained in such a manner as to prevent excessive corrosion and deterioration.

**(2) SAFE CONDITIONS.** The inspector shall note conditions during internal inspection, external inspection, or hydrostatic pressure test and shall order changes or repairs which will place the boiler or pressure vessel in a safe working condition.

Note: Sections VI and VII of the ASME boiler and pressure vessel code, Recommended Rules for Care and Operation of Heating Boilers and Recommended Rules for Care of Power Boilers, are excellent guides for boiler owners and operators.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.38 Reporting accidents, repairs and alterations. (1) ACCIDENTS.** Whenever a boiler or pressure vessel fails and causes injury to any person, the owner or user shall report the facts involved to the department within the following 24 hours. The owner or user may not remove or disturb the boiler or pressure vessel or any of its parts nor permit any such removal or disturbance prior to receiving authorization from the department, except for the purpose of saving human life or further property damage.

**(2) REPAIRS AND ALTERATIONS.** The owner or user shall report any repairs or alterations of a boiler or pressure vessel as required in ch. ILHR 42.

**(3) FUEL CONVERSIONS.** The owner or user shall report conversions of boilers to other fuels.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.39 Condemnation. (1) AUTHORITY.** Only the department may condemn a boiler or pressure vessel. Any boiler or pressure vessel declared by an authorized inspector to be unsafe and beyond repair shall be referred to the department for condemnation proceedings.

**(2) SYMBOL.** (a) Any boiler or pressure vessel confirmed by the department to be unsafe for further use shall be stamped as follows:

“CONDEMNED”

“Arrowhead Stamp x Wisconsin x Arrowhead Stamp”

(b) Letters used for the stamp shall be at least 3/8-inch high and arrowheads shall be at least 1/2-inch wide.

**(3) UNLAWFUL USE.** It shall be unlawful for any person, firm, partnership or corporation to use, operate, or offer for sale for operation within the state any condemned boiler or pressure vessel.

History: Register, February, 1988, No. 386, eff. 3-1-88.

**Subchapter IV—New Installations**

**ILHR 41.40 Application.** The provisions of ss. ILHR 41.40 to 41.48 shall apply to all boilers and pressure vessels installed after the effective date of this section.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.41 Installation registration. (1) BOILER OR PRESSURE VESSEL INSTALLATION REGISTRATION.** (a) Except as provided in par. (b), the installation of any boiler or pressure vessel shall be registered with the department by the installer before the operation of the boiler or pressure vessel. Registration shall be in writing on form SBD-6314.

Note: See Appendix A for a copy of form SBD-6314.

(b) Registration with the department is not required for:

- 1. Boilers and pressure vessels exempted from periodic inspections in s. ILHR 41.18; and
- 2. Installations in cities of the first class if an installation registration form has been filed with the appropriate city official.

**(2) POWER PIPING INSTALLATION REGISTRATION.** (a) Except as provided in par. (b), the installation of any power piping system shall be registered with the department by the installer before the

operation of the piping system. Registration shall be in writing on form SB-5204.

Note: See Appendix A for a copy of form SB-5204.

(b) Registration is not required for:

1. Power piping of 2 inches nominal pipe size and smaller;
2. Installations in cities of the first class if an installation registration form has been filed with the appropriate city official;
3. Underground power piping systems which are not located in a walk-in tunnel; and
4. Replacements, modifications and alterations to existing systems and for new installations, any of which do not exceed 50 feet in length.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88; am. (1) (a) and (2) (a), Register, December, 1992, No. 444, eff. 1-1-93.

**ILHR 41.42 ASME code vessels.** (1) **ASME CODE COMPLIANCE.** Except as provided in ss. ILHR 41.43, 41.44 and 41.45, boilers and pressure vessels shall be constructed and installed in accordance with the ASME standards adopted under s. ILHR 41.10. Boilers and pressure vessels designed to other national or international standards may be approved if the design has been accepted by a nationally recognized independent third party.

Note: The department will recognize the applicable case interpretations of the ASME boiler and pressure vessel code as being acceptable.

(2) **FILING WITH NATIONAL BOARD.** Boilers and pressure vessels constructed and installed in accordance with the ASME standards adopted in s. ILHR 41.10 shall have the manufacturer's data report filed with the National Board and shall bear a National Board number.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88; am. (1), Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.43 Wisconsin special vessels.** Where it is not possible or practical to construct a boiler or pressure vessel in strict compliance with s. ILHR 41.42, the department may grant a variance to the owner or user to permit the installation of the boiler or pressure vessel as a Wisconsin special within the state of Wisconsin. The department shall consider a variance request upon receipt of a completed petition for variance form and the required fee. The variance may be granted under the following conditions:

Note: See s. ILHR 41.05 for further explanatory information.

(1) **COMPARABLE SAFETY.** (a) When the method of designing or constructing the boiler or pressure vessel is not covered by the ASME codes listed in s. ILHR 41.10, the department may approve the installation provided adequate proof of comparable safety of the design or construction is shown.

(b) Complete plans, calculations and specifications in duplicate shall be submitted to and approved by the department before installation.

(c) The boiler or pressure vessel shall be stamped "Wisconsin Special" if approved by the department.

(d) All other applicable requirements of the ASME code listed in s. ILHR 41.10 shall be met.

(2) **OWNER-BUILT.** (a) When the boiler or pressure vessel is to be built by an owner for the owner's use, the department may waive the stamping required by the ASME codes listed in s. ILHR 41.10.

(b) Complete plans, calculations and specifications in duplicate shall be submitted to and approved by the department before installation.

(c) The boiler or pressure vessel shall be stamped "Wisconsin Special" if approved by the department.

(d) All other applicable requirements of the ASME code listed in s. ILHR 41.10 shall be met.

(3) **LIMITED QUANTITY.** (a) When a small number of boilers or pressure vessels is to be built by a manufacturer, the department may waive the stamping required by the ASME codes listed in s. ILHR 41.10.

(b) Complete plans, calculations and specifications in duplicate shall be submitted to and approved by the department before installation.

(c) The boiler or pressure vessel shall be stamped "Wisconsin Special" if approved by the department.

(d) All other applicable requirements of the ASME code listed in s. ILHR 41.10 shall be met.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.44 U.S. department of transportation vessels.** Pressure vessels bearing the stamping of the United States department of transportation are not permitted as permanent storage containers, but may be used as replaceable service cylinders and as cylinders for storage of compressed natural gas.

Note: Complete requirements for storage of compressed natural gas are contained in the National Fire Protection Association (NFPA) standard number NFPA 52, available from the NFPA, Batterymarch Park, Quincy, MA 02269.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.45 Noncode vessels.** (1) **EXEMPTED VESSELS.** The following vessels are not required to be constructed and installed in accordance with the ASME codes listed in Table 41.10:

(a) Water heaters and hot water storage tanks, provided water temperatures do not exceed 210° F;

Note: See ch. ILHR 84 for requirements relating to water heaters and hot water storage tanks.

(b) Vessels for containing water under pressure for domestic supply, including those having an air space for expansion;

(c) Pressure vessels used for the processing or storage of water at water temperatures not exceeding 210° F. These vessels may contain a steam or hot water coil or heat exchanger, provided the steam is at or below a pressure of 15 psig and the hot water is at or below a pressure of 160 psig and a temperature of 250° F;

(d) Pressure vessels used for water conditioning and filtration; and

(e) Pressure vessels used in processing and storing of fermented beverages at temperatures not exceeding 140° F.

(2) **VESSEL IDENTIFICATION.** The vessels listed in sub. (1) (b) to (e) shall be identified with the manufacturer's name, a serial number, the allowable working pressure, and the year fabricated.

(3) **PRESSURE RELIEF REQUIREMENTS.** (a) Except as provided in par. (b), the vessels listed in sub. (1) shall meet the pressure relief device requirements of the ASME codes listed in Table 41.10.

Note: Pressure relief devices are not required on each vessel of a system if the system is properly equipped with pressure relief devices. For systems containing unheated water storage tanks, a pressure relief device is needed when the pressure-inducing source is capable of imposing a pressure greater than the design pressure of the tanks.

(b) Water heaters and hot water storage tanks shall be equipped with pressure-temperature relief devices in accordance with ch. ILHR 84.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88; r. and recr. (1) (a) and (3) (b), Register, December, 1992, No. 444, eff. 1-1-93.

**ILHR 41.46 Power piping.** (1) **GENERAL.** Power piping shall be installed in accordance with the ANSI standard for power piping, including addenda, listed in Table 41.10. The use of slip-on flanges exceeding 4-inches nominal pipe size shall not be permitted on power piping.

(2) **BOILER EXTERNAL PIPING.** Boiler external piping within the scope of section I of the ASME code shall be installed in accordance with the ANSI standard for power piping, including addenda, listed in Table 41.10.

(3) **APPLICATION.** This section applies to new systems as well as all replacements, modifications, and alterations to existing systems.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88; r. and recr. Register, February, 1990, No. 410, eff. 3-1-90.

**ILHR 41.47 Multi-boiler installations.** When hot water heating boilers are installed in multiples with a common header and a common return, isolation valves may be eliminated between units and the units may be considered as one boiler provided:

(1) **OUTPUT LIMIT.** No single unit exceeds 500,000 Btu per hour output;

(2) **PRESSURE RELIEF.** Each unit has a pressure relief device as required by the ASME code, or the common header has a pressure relief device with sufficient relieving capacity for all units in the installation;

(3) **CONTROLS.** Each unit has operating controls and safety controls acceptable to the department; and

(4) **LOW-WATER CUTOFF.** The fuel supply to each unit is shut off by a low-water cutoff in the event of low water in the system.

**History:** Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.48 Organic fluid heat transfer systems.** Boilers and coil type heaters which utilize organic thermal fluids as a heat transfer media shall be designed, constructed and installed in accordance with the ASME standards adopted under s. ILHR 41.10. Piping for organic thermal fluids used as a heat transfer media and subject to temperatures in excess of 250° F shall be installed in accordance with the ANSI standard for power piping adopted under s. ILHR 41.10.

**Note:** See s. ILHR 41.16 for inspection requirements.

**History:** Cr. Register, February, 1988, No. 386, eff. 3-1-88; am Register, May, 1994, No. 461, eff. 6-1-94.

**ILHR 41.49 Wood-burning boilers.** This section applies to hand-fired wood-burning boilers that are used for space heating and that are not constructed and installed in accordance with the ASME code.

(1) **DESIGN.** (a) The boiler shall be constructed with self-contained weatherproofing with no additional structure enclosing the fired unit.

(b) The boiler shall be listed by a nationally recognized testing laboratory acceptable to the department.

**Note:** Examples of acceptable testing laboratories include, but are not limited to, PFS Corporation, UL and Factory Mutual.

(c) The boiler shall be designed for operation at atmospheric pressure and be properly vented to prevent a positive pressure condition.

(2) **INSTALLATION REGISTRATION.** The installation of the boiler shall be registered with the department by the installer using form SBD-6314.

**Note:** See Appendix A for a copy of form SBD-6314.

(3) **INSTALLATION.** (a) The boiler shall be located away from other structures in accordance with the manufacturer's recommendation.

(b) The boiler shall be enclosed by fencing or other barriers to prevent access by unauthorized persons.

(c) The boiler shall be manually fired and shall be limited to using wood or other solid fuels as the source of energy.

(d) The installation shall be provided with means to prevent freezing of the water supply and return lines.

(4) **INSPECTION.** (a) The installation shall be inspected by the department for compliance with this section before the boiler is placed in operation.

**Note:** Periodic inspections will not be performed on wood-burning boilers.

(b) Fees for the installation inspection shall be charged in accordance with s. ILHR 2.03.

(5) **REPAIRS.** (a) Repairs to the boiler shall be made in accordance with the manufacturer's recommendations.

(b) Welded repairs to the boiler shall be made by welders qualified in accordance with s. ILHR 53.53 or the ASME Code section IX.

(c) The department shall be notified by the contractor of any welded repairs to the boiler.

**History:** Cr. Register, December, 1992, No. 444, eff. 1-1-93; r. and recr. (2), (3) (a), am. (4) (a), Register, June, 1996, No. 486, eff. 7-1-96.

## Subchapter V—Nuclear Power Plants

**ILHR 41.53 Application.** The provisions of ss. ILHR 41.53 to 41.57 shall apply to all existing nuclear power plants and to all nuclear power plants constructed after March 1, 1988.

**History:** Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.54 installation registration.** (1) **OWNER REPORT FILING BEFORE OPERATION.** The owner of any nuclear class pressure vessel within the scope of ASME code section III, except those vessels exempted from periodic inspections in s. ILHR 41.18, shall file a copy of form N-3, ASME data report, with the department before operating the pressure vessel.

**Note:** Form N-3 is available from the American Society of Mechanical Engineers.

(2) **REGISTRATION OF BOILERS, PRESSURE VESSELS AND POWER PIPING.** All non-nuclear class boilers, pressure vessels and power piping at nuclear power plants shall be registered with the department as required by s. ILHR 41.41. The installation inspection shall meet the requirements of s. ILHR 41.16.

**Note:** Large groups of vessels may be reported in summary form in lieu of individual reports for each vessel.

**History:** Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.55 Periodic inspections.** (1) **IN-SERVICE INSPECTION PROGRAM.** The owner or user shall file with the department an in-service inspection plan as required by section XI of the ASME code. The department shall be notified at least 10 business days prior to all planned shutdowns which include in-service inspections.

**Note:** A copy of the in-service inspection plan accepted by the nuclear regulatory commission will be acceptable to the department in satisfying the filing of an in-service inspection plan.

(2) **STATEMENT OF INSPECTION SERVICE CONTRACT.** The owner or user shall file a statement with the department indicating possession of an arrangement with an authorized inspection agency to provide inspection services under section XI of the ASME code. The statement shall include the name and address of the current authorized inspection agency.

(3) **IN-SERVICE INSPECTION REPORT.** Within 90 calendar days after each in-service inspection, the owner or user shall submit to the department a copy of form NIS-1, owner's data report for in-service inspection, describing the inspections performed under section XI of the ASME code.

**Note:** Form NIS-1 is available from the American Society of Mechanical Engineers.

(4) **FREQUENCY OF INSPECTION.** Pressure vessels located within a nuclear containment may be inspected as part of the in-service inspection. The vessels shall be inspected at least once every 36 months. If operating conditions require, longer periods not to exceed 3 months between inspections may be approved by the department upon receipt of a written request for an extension. The authorized inspection agency shall concur with the owner's request for extension by letter to the department.

**History:** Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.56 Welded repair.** (1) **RECORD OF REPAIR.** Except as provided in sub. (3), the owner or the owner's agent shall furnish the department, within 90 calendar days, a record of repair, form SB-190, R-1 or NR-1, when any component within the scope of ASME code section XI is repaired by welding. Form SB-190 shall be filed by organizations who do not possess an ASME certificate of authorization or a national board R or NR certificate.

**Note:** No other supporting documents are required to be submitted to meet this requirement.

**Note:** Multiple repairs to the same object may be reported on a single report form.

**Note:** See Appendix A for copies of forms SB-190, R-1 and NR-1.



(2) RECORD OF MODIFICATIONS, REPLACEMENT, ADDITIONS OR ALTERATIONS. Except as provided in sub. (3), when modifications, replacements, additions or alterations are made by welding, the requirement stated in sub. (1) shall apply.

(3) EXEMPTION. Piping, valves and fittings of 2-inch nominal pipe size and smaller are exempt from the requirements of this section.

History: Cr. Register, February, 1988, No. 386, eff. 3-1-88.

**ILHR 41.57 Report of incidents.** The owner or the owner's agent shall report to the department any incident involving pressure-retaining components within the scope of section XI of the ASME code which requires notification to the U.S. nuclear regulatory commission. The report shall be filed coincident with the report to the U.S. nuclear regulatory commission.

Note: It is the intent of the department to avoid conflicts with the requirements of the U.S. nuclear regulatory commission

**ILHR 41.60 Application.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.61 Maximum allowable working pressures.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.62 Code constructed vessels.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.63 Pressure calculations for shells.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.64 Pressure calculations for flat heads and flat surfaces.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.65 Pressure calculations for dished heads.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.66 Dished head restrictions.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.67 Pressure calculation for furnaces and circular flues.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.68 Boiler plate thickness.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.69 Safety devices and other appliances.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.69 Safety devices and other appliances.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.70 Factor of safety.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.71 Strength of materials.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.72 Shearing strength of rivets.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.73 Efficiency of joint.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.74 Ligament between parallel tube holes.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.75 Ligament between parallel tube holes.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.76 Maximum pressure for cast iron boilers.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.77 Safety or relief valves required on boilers.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.78 Safety valves for low pressure steam, miniature and power boilers.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.79 Safety relief valves for hot water boilers.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.80 Thermometers for hot water boilers.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.81 Water glass.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.82 Gage cocks.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.83 Water column piping.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.84 Pressure gages.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.85 Stop valves on discharge outlets.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.86 Steam mains.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.87 Bottom blowoff or drain.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.88 Feed pipe.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.89 Combustion regulators for boilers.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.90 Washout and inspection openings.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

**ILHR 41.91 Threaded openings.** History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

ILHR 41.92 Boiler setting and installation. History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

ILHR 41.93 Boiler doors. History: Cr. Register, February, 1988, No. 386,

ILHR 41.94 Pressure relief devices required for unfired pressure vessels. History: Cr. Register, February, 1988, No. 386, eff. 3-1-88, r. Register, June, 1996, No. 486, eff. 7-1-96.

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