

Chapter Ind 41

BOILER AND PRESSURE VESSEL CODE

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Hist: Chg. 41.04 to 41.02 to 4-30-68 rec'd off 5-1-68

PART I

SCOPE

Ind 41.01 Scope. (1) The provisions of this code apply to boilers and pressure vessels in use at places of employment and in public buildings.

Note: Section 101.01 (2), Wis. 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 (a) private domestic service which does not involve the use of mechanical power or (b) farming. The term "farming" includes those activities specified in section 102.04 (3), and also includes the transportation of farm products, supplies or equipment directly to the farm by the operator of said farm or his

employees 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.

(2) Vessels used for the storage and transportation of flammable liquids, liquefied petroleum gas, anhydrous ammonia, and refrigerants shall be subject to the provisions of this code, unless covered by other Wisconsin administrative codes or federal codes.

History: Cr. Register, April 1961, No. 64, eff. 5-1-74; r. and recr., Register, May, 1974, No. 221, eff. 6-1-74.

PART II DEFINITIONS

Ind 41.02 Definitions. (1) ASME BOILER AND PRESSURE VESSEL CODES are those published by the American Society of Mechanical Engineers and will hereinafter be referred to as ASME.

(2) **BOILER.** A closed vessel intended for use in heating water or for the application of heat to generate steam or other vapor to be used externally to itself.

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

(b) *Miniature boiler.* A boiler on which the safety valve is set at over 15 psig and that does not exceed the following limits:

16 inch inside diameter of shell;

5 cubic feet gross volume;

100 psi maximum allowable working pressure.

(c) *Portable boiler.* An internally fired boiler primarily intended for temporary location and whose construction and usage is obviously of a portable nature.

(d) *Power boiler.* A boiler on which the safety valves are set at a pressure of more than 15 psig and that exceeds the dimensions of a miniature boiler.

(3) **CERTIFICATE OF COMPETENCY.** A certificate issued to a boiler or pressure vessel inspector by the department.

(4) **CONDEMNED.** A boiler or pressure vessel declared to be unsafe and has an applied stamping designating its condemnation.

(5) **DEPARTMENT.** Means the department of industry, labor and human relations.

(6) **EXISTING INSTALLATION.** Boiler and pressure vessels placed in operation or contracted for prior to January 1, 1957. (See part VI.)

(7) **EXTERNAL INSPECTION.** One made while boiler or vessel is in operation.

(8) **FUSION WELDING.** The melting together of filler metal and base metal, or of base metal only, which results in coalescence.

(9) **HOT WATER HEATING BOILER AND HOT WATER SUPPLY BOILER.** 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. (A boiler exceeding either of these limits shall be classified as a power boiler.)

(10) **INSPECTOR, AUTHORIZED OR QUALIFIED.** (a) *Field inspector.* A boiler or pressure vessel inspector who holds a valid certificate of competency issued by the department.

(b) *Shop inspector.* A boiler or pressure vessel inspector who is holding the necessary commissions and employed by a city or a state which has adopted the ASME boiler and pressure vessel code, or who is employed by an insurance company and who, when performing shop inspections in Wisconsin, holds a certificate of competency issued by the department.

(11) **INTERNAL INSPECTION.** One 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.

(12) **NON-STANDARD BOILER OR NON-STANDARD PRESSURE VESSEL.** One not bearing a valid Wisconsin stamping, nor the ASME stamping, nor the National Board stamping, nor the U.S. department of transportation stamping, nor the stamping of the API-ASME, nor any stamping authorized by other applicable codes.

(13) **OWNER OR USER.** Any person, firm, or corporation owning or operating a boiler or pressure vessel.

(14) **PRESSURE VESSEL.** A vessel that obtains its pressure from an external source or from an indirect application of heat.

(15) **REPAIR, MAJOR REPAIR, AND ALTERATION.**

(a) *Repair.* Work necessary to return a boiler or pressure vessel to a safe satisfactory condition.

(b) *Major repair.* A repair upon which the strength of a boiler or pressure vessel will depend.

(c) *Alteration.* A change in a boiler or pressure vessel that substantially alters the original design requiring consideration of the effect of the change on the original design. It is not intended that the addition of nozzles smaller than an unreinforced opening size be considered an alteration.

(16) **SECONDHAND VESSEL.** A boiler or pressure vessel when both location and ownership have been changed subsequent to the original installation.

Note: For further explanation of definitions, see the current edition of the ASME Code—Section VIII—Scope.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; am. (2) (b), (7), (10), Register, January, 1966, No. 121, eff. 2-1-66; am. (3), (4), (8) (a) and (b), (9), (10), (11), (12), (13), (14), (15), and cr (16), Register, October, 1970, No. 178, eff. 11-1-70; r. and recr., Register, May, 1974, No. 221, eff. 6-1-74.

PART III

GENERAL RULES

Ind 41.03 Safety regulations. (1) No boiler or pressure vessel shall be operated at a pressure in excess of the maximum operating pressure stated on its current certificate of operation.

(2) No unauthorized person shall remove or tamper with any connected safety device nor shall any person adjust a connected safety valve to a greater relieving pressure than that allowed for the vessel as stated on its current certificate of operation.

(3) Boiler 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 applicable Wisconsin Administrative Code sections in addition to the Wisconsin Boiler and Pressure Vessel Code.

Some of the Wisconsin Code sections to be considered are as follows:

Section Ind 59.59 (Combustion Air Intake Requirements)

Section Ind 52.11 (Metal Smoke Stack Requirements)

Section Ind 54.13, 55.29, 56.15, & 57.20 (Boiler Room Requirements)

Section Ind 69.01 (Fee Schedule)

Section Ind 59.63(1) (Safety Fuel Burners)

Wisconsin Administrative Codes may be obtained by contacting State Department of Administration, Document Sales and Distribution, 202 So. Thornton Ave., Madison, Wis. 53702.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; am. (3), Register, January, 1966, No. 121, eff. 2-1-66; am., Register, February, 1971, No. 182, eff. 3-1-71.

Ind 41.04 Reporting accidents, repairs, major repairs, and alterations. (1) 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 shall 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) The owner or user shall report any repairs, major repairs, or alterations of a boiler or pressure vessel as required in chapter Ind 42. The owner or user shall also report conversions to other fuels.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; am. Register, February, 1971, No. 182, eff. 3-1-71; r. and recr., Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.05 Reports required for installations of boilers and pressure vessels. (1) The owner or user of any new or used boiler or pressure vessel, except as regulated in section Ind 41.21, shall file form SB-257 with the department before operating the boiler or pressure vessel, unless the boiler or pressure vessel is installed in a city of the first class and the city has filed Form SB-257 or its equivalent with the department.

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INSTALLATION REGISTRATION

SB-257 (11/71)

State of Wisconsin
 Department of Industry, Labor & Human Relations
INDUSTRIAL SAFETY AND BUILDINGS DIVISION

Complete appropriate portion

Installing Contractor shall prepare this form in triplicate and distribute as follows:

White — Attach Registration Fee of \$5.00, making check payable to Wisconsin Department of Industry, Labor & Human Relations. Send to Industrial Safety & Buildings Division, Box 2209, Madison, Wisconsin 53701.

Yellow — Send to Owner who shall POST IT IN A CONSPICUOUS PLACE.

Pink — Retain for file

BOILER		PRESSURE VESSEL
Mfgd By		Diameter
<input type="checkbox"/> Power <input type="checkbox"/> Heating <input type="checkbox"/> Miniature		
<input type="checkbox"/> New <input type="checkbox"/> Used		Length
Mfr's Data Report <input type="checkbox"/> Yes <input type="checkbox"/> No		
Heating Surface	Waterwalls	<input type="checkbox"/> New <input type="checkbox"/> Used

Name of User or Owner		Location of Installation	
Street Address		Wis. Registration No.	Natl. Board No.
City	State	Zip	ASME Mfgr Serial No.
Other No.			
Safety Valves—Settings		Capacity	
1. _____ 2. _____ 3. _____		P S I G Maximum Allowable Pressure _____ Hydrostatic Test Pressure _____ Date Tested _____	
Authorized Inspector	Wis. Comm. No.	Employer	Date Inspected
Name of Installing Contractor	Street Address	City	State
			Zip Code
Date Installation Completed	Signature of Installer	Title	Date Registered

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(2) For required registration fees for installations outside a city of the first class, see Wis. Adm. Code chapter Ind 69, Fee Schedule.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; am. Register, February, 1971, No. 182, eff. 3-1-71; r. and recr., Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.06 Identification of boilers and pressure vessels. (1) The owner or user of a boiler or pressure vessel shall number each vessel in some permanent manner and in an accessible location.

(2) Boilers and pressure vessels subject to periodic inspections (see Ind 41.20) shall be identified by a registration number supplied by the department. The registration number shall be affixed by an authorized inspector. The state tag shall be attached to the vessel at a location which can be easily viewed.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; r. and recr., Register, February, 1971, No. 182, eff. 3-1-71; am. (2), Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.08 Certificate of competency as inspector. (1) **CERTIFICATE REQUIRED.** An inspection report covering a boiler or pressure vessel may be recognized and accepted only when the inspector holds a valid certificate of competency issued by the department.

(2) **ELIGIBILITY.** (a) The applicant for a certificate of competency as a boiler or pressure vessel inspector shall be an employe of the state, a municipality, an insurance company, or a corporation or company authorized to make its own inspections.

(b) The applicant shall be at least 25 years of age. He shall have had at least 3 years of experience in one or more of the following endeavors: construction, repairing, inspecting, or operating engineer in charge of high pressure steam boilers or pressure vessels.

(c) A degree in mechanical engineering may be accepted as the equivalent of 2 years practical experience.

(d) The applicant's employer shall certify that applicant's statement of experience is correct.

(3) **APPLICATIONS AND RENEWALS.** (a) Fees for examination and reciprocal certificates of competency shall be submitted with applications and in the amount specified in Wis. Adm. Code chapter Ind 69.

(b) Renewal fees shall be submitted with the request for renewal and in the amount specified in chapter Ind 69.

(c) A request for renewal shall be filed with the department on or before January 1 of the calendar year for which the certificate is to be valid.

(d) Applications for examinations and applications for renewals by employes of the state and employes of the city of Milwaukee require no fee.

(4) **EXAMINATIONS.** (a) Certificates of competency for a boiler or pressure vessel inspector may be issued by the department to eligible applicants passing the examinations prescribed by and conducted by the department.

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(b) Holders of certificates, who do not apply for renewal in any 3 year period may be required to pass a scheduled examination.

(5) ANNULMENTS AND REVOCATIONS. (a) A certificate becomes invalid when the holder terminates his employment with the employer of record at the time of issue. A renewal may be obtained under the provisions of this section provided applicant meets eligibility requirements.

(b) A certificate may be annulled or revoked when incompetency or negligence is determined after investigation.

(6) RECIPROCAL COMMISSIONS. (a) A reciprocal certificate of competency may be granted by the department to a boiler or pressure vessel inspector under the following conditions:

1. The inspector shall be employed by a boiler insurance company licensed to do business in Wisconsin. The boiler insurance company shall make the application for a reciprocal commission to the department.

2. The inspector shall hold a commission issued by the National Board of Boiler and Pressure Vessel Inspectors or a certificate of competency from a city or state which has adopted the A.S.M.E. Boiler and Pressure Vessel Code and which holds a written examination similar to that required by Wisconsin.

3. The inspector shall appear before an examining board appointed by the department to review his qualifications as an inspector.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; r. and recr. Register, February, 1971, No. 182, eff. 3-1-71; am. (1), (3) (c), (4) (a), (6) (a) 1. and 3., Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.10 Adoption of standards. (1) The standards, amendments and errata issued by the American Society of Mechanical Engineers as listed in table 41.10-A are hereby incorporated by reference into this code.

(2) Pursuant to section 227.025, Wisconsin Statutes, consent has been granted to incorporate by reference the rules contained in the standards, amendments and errata listed in table 41.10-A.

(a) Copies are on file in the offices of the department, the secretary of state and the revisor of statutes.

(b) Copies may be procured for personal use from the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th St., New York, New York 10017.

TABLE 41.10-A

		As amended by Summer Addenda issued June 30th and Winter Addenda issued December 31st of each respective year: S-Summer; W-Winter.				
		1974		1975		1976
		S	W	S	W	S
1.	Section I	Power Boilers, 1974 Edition				
2.	Section II	Material Specifications, 1974 Edition				
	a.	Part A — Ferrous Material				
	b.	Part B — Nonferrous Material				
	c.	Part C — Welding Rods, Electrodes, and Filler Metals				
3.	Section III	Nuclear Power Plant Components, Division 1, 1974 Edition				
	a.	Subsection NA — General Requirements				
	b.	Subsection NB — Class 1 Components				
	c.	Subsection NC — Class 2 Components				
	d.	Subsection ND — Class 3 Components				
	e.	Subsection NE — Class MC Components				
	f.	Subsection NF — Components Supports				
	g.	Subsection NG — Core Support Structures				
4.	Section IV	Heating Boilers, 1974 Edition				
5.	Section V	Nondestructive Examination, 1974 Edition				
6.	Section VIII	Pressure Vessels, 1974 Edition				
	a.	Division 1				
	b.	Division 2				
7.	Section IX	Welding and Brazing Qualifications, 1974 Edition				
8.	Section X	Fiberglass Reinforced Plastic Pressure Vessels, 1974 Edition				
9.	Section XI	Rules for Inservice Inspection of Nuclear Power Plant Components, 1974 Edition				

History: Cr. Register, May, 1974, No. 221, eff. 6-1-74; r. and recr. Register, April, 1975, No. 232, eff. 5-1-75; r. and recr. table Register, May, 1976, No. 245, eff. 6-1-76; r. and recr. table, Register, March, 1977, No. 255, eff. 4-1-77.

Ind 41.11 Boiler blow-down equipment. (1) The blow-down from a boiler or boilers that enters a sewer system or blow-down which is considered a hazard to life or property shall pass through some form of blow-off equipment that will reduce pressure and temperature as required hereinafter.

(2) The temperature of the water leaving the blow-off equipment shall not exceed 140 F.

(3) The pressure of the blow-down leaving any type of blow-off equipment shall not exceed 5 psi.

(4) The blow-off piping and fittings between the boiler and the blow-off tank shall comply with sections Ind 41.50 and Ind 41.51 of this code.

(5) The tank shall be designed in accordance with sections Ind 41.50 and Ind 41.51 of this code for a working pressure of at least one-fourth the maximum working pressure of the boiler to which it is connected.

(6) All blow-off equipment, except centrifugal blow-down separators, shall be fitted with openings to facilitate cleaning and inspection and shall have:

- (a) A pressure gauge graduated from 0-25 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 1/2 inch in diameter. The lower connection to the glass shall be at a point about 6 inches below the water line; the upper connection about 6 inches above,
- (d) A drain connection at least 2-inch standard pipe size,
- (e) Connections designed so that freezing will not close the inlet, the outlet, or the vent,
- (f) Vent piping, full size, piped to the outside atmosphere and discharged to a safe location.

Note: Blow-off equipment designed in accordance with the boiler blow-off equipment code issued by the National Board of Boiler and Pressure Vessel Inspectors, 1968 edition, will meet the requirements of this section. Other methods of designing blow-off equipment may be used if approved by the department.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; r. and recr. (6), Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.12 Vessels supplied through pressure reducing valves. (1) The following formula shall be used for determining the sizes of safety and relief valves on pressure vessels such as pressure cookers, indirect hot water heaters, equipment in heating systems, etc., which are supplied through pressure reducing valves from boilers carrying a higher steam pressure. Where a pressure reducing valve is supplied by a boiler, the capacity of the safety valve or valves on the low pressure side of the system need not exceed the capacity of the boiler.

$$RVC = \frac{1}{2} \times OC \times VSPA$$

Where RVC = relief valve capacity, lbs. of steam per hour.

OC = orifice capacity, lbs. of steam per hour per sq. in. (See Table 1.)

VSPA = valve size pipe area, sq. in. (See Table 2.)

TABLE 1.—ORIFICE RELIEVING CAPACITIES, POUNDS PER SQUARE INCH

Outlet pres., psig	Pressure-reducing valve inlet pressure, psig															
	400	350	300	250	200	175	150	125	100	85	75	60	50	40	30	25
250	21000	17100	10800	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
200	21350	18250	15350	10900	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
175	21350	18250	16000	12600	7250	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
150	21350	18250	16200	13400	9540	6760	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
125	21350	18250	16200	13600	10800	8780	9220	-----	-----	-----	-----	-----	-----	-----	-----	-----
110	21350	18250	16200	13600	11000	9460	7420	4550	-----	-----	-----	-----	-----	-----	-----	-----
100	21350	18250	16200	13600	11000	9760	7970	5630	-----	-----	-----	-----	-----	-----	-----	-----
85	21350	18250	16200	13600	11000	9760	8480	6640	4070	-----	-----	-----	-----	-----	-----	-----
75	21350	18250	16200	13600	11000	9760	8480	7050	4980	3150	-----	-----	-----	-----	-----	-----
60	21350	18250	16200	13600	11000	9760	8480	7200	5750	4540	3520	-----	-----	-----	-----	-----
50	21350	18250	16200	13600	11000	9760	8480	7200	5920	5000	4290	2680	-----	-----	-----	-----
40	21350	18250	16200	13600	11000	9760	8480	7200	5920	5140	4630	3480	-----	-----	-----	-----
30	21350	18250	16200	13600	11000	9760	8480	7200	5920	5140	4630	3860	3140	2210	-----	-----
25	21350	18250	16200	13600	11000	9760	8480	7200	5920	5140	4630	3860	3340	2580	1485	-----
15	21350	18250	16200	13600	11000	9760	8480	7200	5920	5140	4630	3860	3340	2830	2320	1800
10	21350	18250	16200	13600	11000	9760	8480	7200	5920	5140	4630	3860	3340	2830	2320	2060
5	21350	18250	16200	13600	11000	9760	8480	7200	5920	5140	4630	3860	3340	2830	2320	2060

NOTE: The following formulas shall be used in connection with this table to calculate the required relieving capacity of safety valves installed on the low-pressure side of pressure-reducing valves. Use the formula that requires the larger relieving capacity.

$$W = \frac{1}{2} AC \text{ or } W = \frac{1}{2} A^1 C$$

where: W = required safety valve relieving capacity.

A = internal area of the pipe size of the pressure-reducing valve (use pipe areas of Table 2).

A¹ = internal area of the pipe size of the by-pass line around the pressure-reducing valve.

C = orifice relieving capacity, pounds of steam per hour per square inch for the given inlet and outlet pressures of the pressure-reducing valve (from this Table).

TABLE 2.—INTERNAL PIPE AREA

Nominal pipe size, inches	STANDARD		
	Actual internal diameter, inches	Approx. internal diameter, inches	Approx. internal area, square inches
$\frac{3}{8}$ -----	0.675	0.49	0.19
$\frac{1}{2}$ -----	0.840	0.62	0.30
$\frac{3}{4}$ -----	1.050	0.82	0.53
1-----	1.315	1.05	0.86
$1\frac{1}{4}$ -----	1.660	1.38	1.50
$1\frac{1}{2}$ -----	1.900	1.61	2.04
2-----	2.375	2.07	3.36
$2\frac{1}{2}$ -----	2.875	2.47	4.78
3-----	3.5	3.07	7.39
$3\frac{1}{2}$ -----	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-----	10.750	10.19	81.55
12-----	12.750	12.09	114.80

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

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

$$RVC = \frac{1}{2} \times OC \times BPA.$$

Where RVC = relief valve capacity, lbs. of steam per hour.

OC = orifice capacity, lbs. of steam per hour per square inch. (See Table 1.)

BPA = bypass pipe area, sq. inch. (See Table 2.)

(b) The larger of the relief valve capacities calculated by the formulas in subsections Ind 41.12 (1) and (1) (a) shall be used for selecting the relief valve for the vessel.

Note: Example. Suppose a high pressure boiler operating at 125 psi distributes steam to a series of 40 psi ASME constructed retorts through a $1\frac{1}{2}$ inch size pressure reducing valve provided with a glove-valved 1 inch bypass. Determine the proper ASME relief valve protection for the retorts. Utilizing data in tables and the first of the 2 formulas above:

$$W = \frac{1}{2} \times 7200 \times 2.04 = 4896 \text{ lbs. steam per hour.}$$

Checking the bypass steam flow according to the second formula gives:

$$W = \frac{1}{2} \times 7200 \times 0.86 = 3100 \text{ lbs. steam per hour.}$$

The potential steam flow through the pressure reducing valve is 4896 lbs. per hour rated capacity or

$$4896 \times 1000 \text{ or } 4,896,000 \text{ BTU per hour.}$$

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; am. Register, January, 1966, No. 121, eff. 2-1-66; r. and recr. (1) and Table 1, Register, February, 1971, No. 182, eff. 3-1-71; r. (1) second "Note" following Table 2 including referenced formulas that follow this note and cr. (1) (a) and (b), Register, May, 1971, No. 185, eff. 6-1-71.

Ind 41.13 Maintenance. (1) All boilers shall be installed and maintained in such a manner as to prevent excessive corrosion and deterioration.

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

Note: Sections VI and VII, ASME Boiler and Pressure Vessel Code, "Recommended Rules for Care and Operating of Heating Boilers" and "Recommended Rules for Care of Power Boilers" are excellent guides for boiler owners and operators.

History: Cr. Register, February, 1971, No. 182, eff. 3-1-71.

Ind 41.14 Inspection of new installations. (1) A new installation of a new or used boiler or pressure vessel shall be inspected by the department before it is placed in operation unless either of the following conditions are met:

(a) The boilers or pressure vessels are exempt from periodic inspections in Ind 41.21. ✓

(b) The boilers or pressure vessels are installed in a city of the first class and inspections are made by the city, wherein the city shall keep a record of such inspections and shall submit a copy to the department.

History: Cr. Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.15 Manufacturer's data reports. (1) Before any new or used boiler or pressure vessel is placed in service, the owner or user shall file a manufacturer's data report with the department, except

(a) Boilers and pressure vessels exempt from ASME code construction requirements. See Ind 41.50. ✓

(b) Boilers and pressure vessels located in a city of the first class that requires the filing of manufacturer's data reports and that files them with the department.

History: Cr. Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.16 Low-water cutoff and water feeder. (1) 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. 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.

(2) Designs embodying a float and float bowl, or probe controls 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.

Note: See section Ind 41.54 for hot water heating boilers.

History: Cr. Register, May, 1974, No. 221, eff. 6-1-74.

PART IV INSPECTIONS

Ind 41.17 Inspection fees. Each inspection, test, or service performed by the department shall be paid for at rates established in Chapter Ind 69, Fee Schedule. (The owner is responsible for the payment of fees.)

History: Cr. Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.20 Periodic inspections required. (1) ALL INSPECTIONS. The authorized inspectors of the department, upon presenting appropriate credentials to the owner, operator, or agent in charge, are authorized—

(a) To 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 employee of an employer; and

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

(2) **CONTACTING REPRESENTATIVE.** The inspector before making his inspection shall contact a representative of the employer and a representative authorized by his employees who shall be given an opportunity to accompany the inspector during the physical inspection of any workplace under subsection (1) for the purpose of aiding such inspection.

(a) Where there is no authorized employee representative, the inspector shall consult with a reasonable number of employees concerning matters of health and safety in the workplace.

Note: The department policy 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 as, for example, inside boilers or in precarious locations of elevator installations, but otherwise these rules will be diligently observed.

(3) **INSPECTION OF BOILERS.** Except as regulated in sections Ind 41.20 (5) and Ind 41.21, boilers shall be subjected to either a regular internal or external inspection at least once every 12 months by a qualified inspector.

(a) *When internal inspection is not possible.* Where an internal inspection is not possible because of the construction of the boiler, an external inspection will be acceptable.

(4) **INSPECTION OF PRESSURE VESSELS.** Except as regulated in section Ind 41.21, pressure vessels shall be subjected to a regular internal or external inspection at least once every 24 months by a qualified inspector.

(5) **INSPECTION OF LOW PRESSURE STEAM OR VAPOR HEATING BOILERS, AND HOT WATER HEATING BOILERS.** Except as regulated in section Ind 41.21, low pressure steam or vapor heating boilers and hot water heating boilers shall be subjected to a regular external or internal inspection at least once every 24 months by a qualified inspector.

Note: Extension of period between inspections. If operating conditions require, longer periods between inspections of boilers may be approved by the department upon a written request for an extension.

Note: For inspection fees, see Wis. Adm. Code, chapter Ind 69, Fee Schedule.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; am. (2), (3), (4), Register, October, 1970, No. 178, eff. 11-1-70; renum. (1), (2), (3), (4) to be (3), (4), (5) and (6) and cr. (1) and (2), Register, April, 1973, No. 208, eff. 5-1-73; r. and recr. (3), (4), (5) and r. (6), Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.21 Vessels exempt from periodic inspections. (1) The following boilers and pressure vessels will not be subject to periodic inspection, but in individual cases any such vessel will be subject to inspection by or on order of the department upon complaint of any person or upon 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 this code:

(a) Boilers or pressure vessels which receive regular inspections by United States government inspectors.

(b) Steam boilers having an internal or external operating pressure not exceeding 15 psig and having an input not exceeding 750,000 Btu per hour; hot water boilers having an operating pressure not exceeding 30 psig and having an input not exceeding 750,000 Btu per hour; and expansion tanks for hot water heating boilers having an operating pressure of less than 50 psig with no limitation on size.

(c) Boilers used exclusively for agricultural purposes.

(d) Miniature boilers.

(e) Pressure vessels having an inside diameter not exceeding 6 inches with no limitation to pressure.

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

(g) Pressure vessels with a volume of less than 1½ cubic feet with no limit on pressure.

(h) Pressure vessels which are used in accordance with the regulations of the U.S. Department of Transportation.

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

(j) Hot water supply boilers and hot water storage vessels.

(k) Vessels used for the storage or processing of cold water including those with air cushions.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; r. and recr. Register, February, 1971, No. 182, eff. 3-1-71; am. (1) (b), (i) and (j), Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.22 Preparation for internal inspection. 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.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; r. and recr. Register, February, 1971, No. 182, eff. 3-1-71.

Ind 41.23 Insurance company inspections. (1) Periodic inspections of boilers and pressure vessels by insurance companies may be accepted by the department under the following conditions:

(a) The boiler and pressure vessel inspectors employed by the insurance company shall hold certificates of competency issued by the department.

(b) The insurance company shall report inspections of boilers and pressure vessels to the department as required in section Ind 41.26.

(c) The inspection procedures used by the insurance company shall conform to the regulations of this code.

(d) The insurance company shall report to the department within 30 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.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; r. and recr. Register, February, 1971, No. 182, eff. 3-1-71; am. (1) (a), (b) and (d), Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.24 Inspections by cities. (1) Periodic inspections of boilers and pressure vessels by cities of the first class may be accepted by the department under the following conditions:

(a) The boiler and pressure vessel inspectors employed by the city shall hold certificates of competency issued by the department.

(b) The city shall keep a record of such periodic inspections and shall submit a copy to the department.

(c) The inspection procedures used by the city shall conform to the regulations of this code.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; r. and recr. Register, February, 1971, No. 182, eff. 3-1-71; am. (1) (a) and (b), Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.25 Companies or corporations allowed to make inspections. (1) Periodic 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:

(a) The boiler and pressure vessel inspectors employed by the company or corporation shall hold certificates of competency issued by the department.

(b) The company or corporation shall report inspections of boilers and pressure vessels to the department as required in section Ind 41.26.

(c) The inspection procedures used by the company or corporation shall conform to the regulations of this code.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; r. and recr. Register, February, 1971, No. 182, eff. 3-1-71; am. (1) (a) and (b), Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.26 Reporting of inspections. (1) Reports of periodic internal or external inspections of boilers and pressure vessels shall be sent to the department within 15 days from the date of inspection.

(2) 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 such cases the first 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.

(b) When violations of this code or unsafe conditions involving the safety of the vessel are found. This report shall be made on ASME Form P-6 and shall explain the violation or unsafe condition with references to code section numbers. A copy of the recommendations to the owner or user of the vessel shall accompany the report to the department.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; am. (1), Register, February, 1971, No. 182, eff. 3-1-71; am., Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.27 Inspection report forms. (1) An internal or external boiler inspection that conforms to periodic inspection requirements (Ind 41.20) shall be reported to the department on inspection form SB 210 or National Board of Boiler and Pressure Vessel Inspectors standard form.

(2) A pressure vessel inspection that conforms to periodic inspection requirements (Ind 41.20) shall be reported to the department on inspection form SB 209 or National Board of Boiler and Pressure Vessel Inspectors standard form.

(a) **Multiple Vessels on a Single Report.** 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 report. The report shall contain the number, description, and use of the vessel and shall be reported to the department on inspection form SB 209 or National Board of Boiler and Pressure Vessel Inspectors standard form.

(3) The inspection report shall be legible and complete as possible. A manufacturer's data report of boiler or pressure vessel shall be available to inspector for first inspection.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; r. and recr. Register, February, 1971, No. 182, eff. 3-1-71; am. (1) and (2), Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.28 Certificates of operation. (1) After each periodic internal or external inspection a certificate of operation shall be issued to the owner or user of the boiler or pressure vessel by the department or by the city authorized by that agency.

(2) The certificate of operation shall give the maximum operating pressure as determined using the regulations of the code.

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

(4) The certificate of operation shall be kept on file on the premises by the owner or user of the boiler or pressure vessel and shall be available when called for by a deputy of the department.

Note: A fee in the amount set in chapter Ind 69, Fee Schedule, shall be paid to the department for all certificates of operation.

History: Cr. Register, April, 1961, No. 64 eff. 5-1-61; am. (1), (4) and (5), Register, January, 1966, No. 121, eff. 2-1-66; am. (1), (2), (3) and (4) and r. (5), Register, October, 1970, No. 178, eff. 11-1-70; am. (1) and (4), Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.29 Condemnation. (1) The condemnation of a boiler or pressure vessel shall be a function of the department only. 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) 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"

Letters shall be at least $\frac{3}{8}$ " high and arrowheads shall be $\frac{1}{2}$ " wide.

(3) 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: Cr. Register, October, 1970, No. 178, eff. 11-1-70; am. (1) and (2), Register, May, 1974, No. 221, eff. 6-1-74.

PART V
NEW INSTALLATIONS
ORIGINAL CONSTRUCTION

Ind 41.50 ASME code vessels. Except as regulated in Wis. Adm. Code sections Ind 41.51, Ind 41.52 and Ind 41.53, boilers and pressure vessels installed after the effective date of this section shall be constructed and installed in accordance with the sections of the ASME Boiler and Pressure Vessel Code adopted under section Ind 41.10 (1) (a).

Note: The department will recognize the applicable "case interpretations" of ASME Boiler and Pressure Vessel Code as being acceptable.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; r. and recr. Register, December, 1962, No. 84, eff. 1-1-63; am. Register, August, 1964, No. 104, eff. 9-1-64; am. Register, January, 1966, No. 121, eff. 2-1-66; am. Register, March, 1966, No. 123, eff. 4-1-66; r. and recr. Register, November, 1970, No. 179, eff. 12-1-70; am. (1) intro. par., Register, March, 1971, No. 183, eff. 4-1-71; r. and recr., Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.51 Wisconsin special vessels. (1) Where it is not possible or practical to construct a boiler or pressure vessel in strict compliance with section Ind 41.50, the department may grant a modification to the owner or user to permit the installation of the vessel as a Wisconsin special within the state of Wisconsin under the following conditions:

(a) When the method of designing or constructing the vessel is not covered by the ASME codes listed in section Ind 41.10, the department may approve the installation of the vessel if adequate proof of comparable safety of the design or construction is shown.

1. Complete plans, calculations, and specifications in duplicate shall be submitted to and approved by the department before the vessel is installed.

2. The vessel shall be stamped "Wisconsin Special".

3. All other applicable requirements of the ASME codes listed in section Ind 41.10 shall be met.

(b) When the vessel is to be built by an owner for his own use, the department may waive the stamping required by the ASME codes listed in section Ind 41.10.

1. Complete plans, calculations, and specifications in duplicate shall be submitted to and approved by the department before the vessel is installed.

2. The vessel shall be stamped "Wisconsin Special".

3. All other applicable requirements of the ASME codes listed in section Ind 41.10 shall be met.

(c) When a small number of vessels is to be built by a manufacturer, the department may waive the stamping required by the ASME codes listed in section Ind 41.10.

1. Complete plans, calculations, and specifications in duplicate shall be submitted to and approved by the department before the vessel is installed.

2. The vessel shall be stamped "Wisconsin Special".

3. All other applicable requirements of the ASME codes listed in section Ind 41.10 shall be met.

(2) The provisions of this section shall not apply to Wisconsin special vessels accepted by the department before the effective date of this section.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; r. and recr., Register, February, 1971, No. 182, eff. 3-1-71; r. and recr., Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.52 U.S. Department of Transportation—Federal Highway Division. Pressure vessels carrying the stamping of the D.O.T. will be considered comparable to a vessel meeting the requirements of section Ind 41.50. When such vessels are used in the state of Wisconsin, it shall be the responsibility of the owner of the vessels to have the construction records of the vessels available for inspection by the department.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; am. Register, February, 1971, No. 182, eff. 3-1-71; am., Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.53 Non-Code vessels. (1) The following vessels will only be required to meet the pressure-relief device requirements of the ASME codes listed in section Ind 41.10.

(a) Water heating apparatus, such as range boilers or tanks having a self-contained gas, oil, or electric heating unit used exclusively for hot water service provided such apparatus carries a seal of approval from a testing agency recognized nationally and by the department. The term "hot water service" shall be construed to mean a system in which the hot water is used for general cleaning purposes as in the bath, the laundry, and in the kitchen.

1. This exception shall not apply when the apparatus is used as a hot water heating boiler.

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

(c) Hot water storage tanks, when heated indirectly by circulating either steam at or below 15 psig, or by hot water at or below 30 psig through a coil or heat exchanger, and the storage water temperature does not exceed 200 F.

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

(e) The vessels listed in paragraphs (b), (c) and (d) of this section shall be identified by stamping showing the manufacturer's name, a serial number, the allowable working pressure, and the year fabricated.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61; am. (1) (intro. par.) and (1) (a), Register, May, 1974, No. 221, eff. 6-1-74.

Ind 41.54 Low water fuel cut-off for hot water heating boilers. Every automatically fired hot water heating boiler installed after the effective date of this section with a heat input of more than 200,000 Btu per hour shall be provided with an automatic low-water fuel cut-off so located as to automatically cut off the fuel supply when the surface of the water falls to the lowest safe water line. The lowest safe water line shall be at or above the height required on a corresponding steam boiler.

History: Cr. Register, April, 1961, No. 64, eff. 5-1-61.