

HISTORICAL - HOBBY BOILERS

PURPOSE:

The intent of this brochure is to educate and provide direction to owners and operators of historical - hobby boilers. The recommendations in this brochure may be applied to all historical boilers in operation for demonstration purposes at fairs, museums, steam shows, historical attractions or any other locations frequented by the public.

Inspection requirements can be found within the Wisconsin Administrative code Chapter Comm 41: Boilers and Pressure Vessels.

DEFINITIONS:

HISTORICAL - HOBBY BOILERS – a steam boiler of riveted construction, preserved, restored or maintained for hobby or demonstration use. Steam locomotives, traction engines, hobby boilers and steam cars may be considered historical boilers.
CERTIFIED INSPECTOR – person who holds a valid credential issued by the department under Chapter Comm 5 as a certified boiler-pressure vessel inspector.

HYDRO PRESSURE TEST – boiler or vessel completely filled with ambient (60-120 degrees F) temperature water and pressurized between 1 to 1.25 times the calculated MAWP or at least the set pressure of the safety valve.

INSERVICE INSPECTION – an inspection performed with the boiler in operation including a visual inspection and a demonstration of safe operating procedures.

INTERNAL / VISUAL INSPECTION – an inspection made when the boiler or pressure vessel is shut down. Handholes, manholes or other openings are removed for inspection of the interior. A thorough cleaning of boiler firesides and watersides must be done prior to inspection.

GENERAL REQUIREMENTS

1. Historical Boilers shall be inspected per Chapter Comm 41 and in accordance with the guidelines set forth in the National Board Inspection Code (NBIC), Part 2, Section 6, Supplement 2. More detail is found in Comm 41, Subchapter IX.
2. Annual inspections shall strictly follow the inspection intervals as provided in the NBIC, Part 2, Section 6, S2.7.3.2.
3. Ultrasonic tests (UT) and pressure calculations shall be completed by the owner, user or a qualified and responsible organization as designated by the owner.
4. Owner/users shall obtain and maintain a current permit to operate (PTO) per Comm 41.24(1a).
5. The current PTO shall be displayed for public view near controls on the engine or equipment during operation at any public location.

INSPECTION AND INTERVALS

INITIAL INSPECTION

Initial inspection shall be performed on all historical boilers to determine baseline criteria needed for the safe operation of the boiler. Owners shall maintain permanent records and make them available upon request. Records of initial inspection shall include:

1. Visual - internal inspection per S2.5.2
2. Inservice Inspection per S2.7.1
3. Initial UT w/ grid mapping per S2.6.2
4. MAWP calculations per S2.10
5. Hydro Pressure test per S2.6.1
6. Other UT, MT or PT to prove integrity

Note: As a guide, owner can use NB Form C-1

SUBSEQUENT INSPECTIONS

Boilers that have completed the initial inspection requirement shall begin the subsequent inspection interval type for each year thereafter per S2.7.3.2.

1. Inservice inspection per S2.7.1
2. Internal / visual Inspection per S2.5.2.2
3. Hydrostatic pressure test per S2.6.1
4. Inservice Inspection per S2.7.1
5. Internal / visual & UT per S2.5.2.2, S2.6.2
6. Hydrostatic Pressure test per S2.6.1

Note: After interval 6, the cycle returns to # 1

INSERVICE INSPECTION

An inspection completed while the boiler is in operation. Owner shall prepare boiler free of leaks for inspection and demonstrate proper function and safe operation per S2.7.1.

INTERNAL / VISUAL INSPECTION

The owner/user shall prepare the boiler for an internal / visual inspection per S2.5.2.

1. Firesides shall be opened and grates removed. The fireside furnace, flues and tubesheets shall be wire brushed, scraped and thoroughly cleaned of soot and ash.
2. Watersides shall be drained with handholes, plugs and inspection openings removed for access. Sediment, scale and mud shall be flushed clean from the boiler.
3. Fusible plugs shall be removed and inspected to determine thread conditions in crown sheet, and confirmed as an ASME Standard plug.
4. The condition of boiler furnace, shell, tubesheet, fittings, staybolts and other materials shall be visually inspected for thinning, pitting, cracks or corrosion.

Note: Above is a guide, reference S2.5.2 details.

HYDROSTATIC PRESSURE TEST

The owner/user shall prepare the boiler for hydrostatic pressure test.

1. Boiler firesides and watersides shall be opened and properly cleaned prior to filling completely with water at temperature between 60° F – 120° F during pressure test.
2. Pressure gages shall be calibrated prior to the test or documentation shall be provided at the time of a test for an inspector to verify that pressure gage calibration was completed.
3. Safety valve(s) shall be removed.
4. The hydrostatic pressure shall be slowly raised to a test pressure acceptable to the inspector and pressurized between 1 to 1.25 times the calculated MAWP or at least the set pressure of the safety valve.
5. The boiler shall be inspected for leakage at firesides, watersides and appurtenance connections.

ULTRASONIC TESTS AND PRESSURE CALCULATIONS

1. Ultrasonic tests shall be completed periodically per NBIC, S2.5.2.2 on a mapped grid system. To obtain meaningful UT test results, the department recommends that owners utilize grid map to document material thickness.
2. Pressure calculations shall be completed per S2.10 and based on the minimum UT thickness data gathered. Documentation shall be made available to the inspector for review and acceptance.
3. Owners shall maintain initial and subsequent grid mapped UT readings with pressure calculations in permanent boiler records to verify fitness for service and utilize as a reference for future repair analysis.
4. Exemptions: Historical boilers bearing an ASME "S" stamp; locomotives that receive regular inspections by the US Government complying with 49 CFR 230 and WI Specials where the owner can provide documentation of the conditional approval are exempted from

the above UT examination and calculation requirements. Note: An Inspector may require UT tests and calculations for any historical boiler based on conditions observed during inspection and/or testing.

RECIPROCITY WITH JURISDICTIONS

Out-of- state historical boilers shall comply with Comm 41.92(2). Documentation shall be made available / acceptable to the certified inspector.

WELD REPAIRS AND ALTERATIONS

Welded repairs and alterations to boilers and pressure vessels must be completed in accordance with Comm 41, Subchapter VI (Comm 41.60 – 41.64) and the National Board Inspection Code.

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<http://www.commerce.wi.gov>

(Scroll down Resource column, Click Safety & Buildings)

- Staff Contact Information
- Specific Programs, "Boilers"
- Code Copies, "Chapter Comm 41"
- Inspector District Maps
- Division Forms, "SBD-6314 or SBD-5204"
- Individual Credential Status
- Search Regulated Object data for B registration #

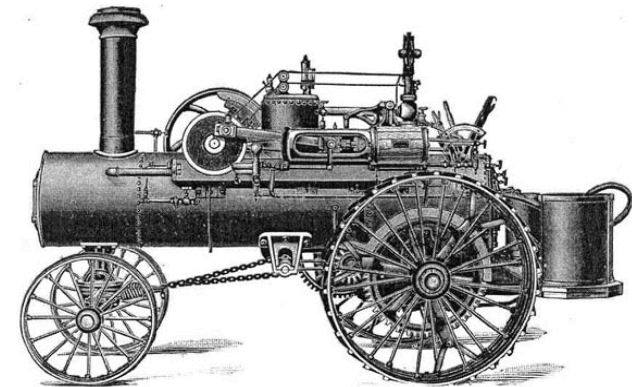


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HISTORICAL-HOBBY BOILERS

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NICHOLS & SHEPARD TRACTION ENGINE.

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