BOILER AND PRESSURE VESSEL INSPECTION

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Many facilities operate some form of a boiler for heating, whether steam or hot water, or high or low pressure. Compressed air tanks may also be used by facility maintenance staff. To ensure these vessels are operated safely, the State of Minnesota has established rules for the design, construction, installation, maintenance and operation of boilers and pressure vessels.

It is essential that each boiler engineer or operator hold the class of license for the specific equipment he or she oversees. Minnesota statutes state: "No person shall be entrusted with the operation of or operate any boiler, steam engine or turbine who has not received a license of proper grade covering that boiler, steam engine or turbine."

Up-to-date boiler operating licenses must be displayed in a conspicuous place in the boiler room. Each person who may be operating the boiler should have his or her license displayed.

REQUIRED INSPECTIONS

DAILY INSPECTIONS AND LOG KEEPING

Depending on the type of boiler equipment in use, regular daily, and possibly weekly or monthly, inspections are required. These inspections must be logged by an operating engineer and made readily available to the boiler inspector during annual inspections or other times upon request.

These inspections should follow guidelines set forth by engineering standards dictated in Minnesota boiler statutes. Sample boiler logs are available from the Minnesota Department of Labor and Industry or may be acquired from the equipment manufacturer.

HOT WATER HEATING BOILERS — **Maintenance • Testing • Inspection Log**

BUILDING	ADDRESS	MONTH	YEAR	FUEL TYPE	BOILER NO.

PERSONS TO BE NOTIFIED IN CASE OF EMERGENCY (INCLUDE NAME AND PHONE NUMBER)

DAILY MAINTENANCE INSPECTION CHECKS

DATES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Checked by (please initial):																															
1. Record Boiler Pressure																															
2. Record Boiler Water Temp																															
3. Record Flue Gas Temp.																															

WEEKLY MAINTENANCE INSPECTION CHECKS

WEEKS	WEEK 1	WEEK 2	WEEK 3	WEEK 4
Checked by (please initial):				
1. Observe Flame Condition				
2. Observe Circuation Pumps				

MONTHLY MAINTENANCE INSPECTION CHECKS (Enter Date Checked)

1. Manual Lift Relief Valves	Relief Valve Check Date:	Date Checked		Date Checked
2. Review Condition of each item and/or Test each item	A. Flame Detection Devices		F. Refractory	
	B. Limit Controls		G. Stop Valves	
	C. Operating Controls		H. Check Valves	
	D. Floor Drains		I. Drain Valves	
	E. Flue Piping		J. Linkages	
3. Observe gage glass on expansion tank			Weekly and Monthly Checks Performed by:	
4. Combustion Air adequate/unobstructed				

COMMENTS:

Sample boiler logs, like the above, and related information can be found at the Minnesota Department of Labor and Industry website under the Boiler Engineer/Boiler Documents page.

ANNUAL INSPECTIONS

It is the responsibility of the owner and the engineer to make sure the boiler is inspected annually and that pressure vessels (e.g., compressed air tanks) are inspected every two years.

MCIT collaborates with Hartford Steam Boiler (HSB) to provide coverage for equipment breakdown, or boiler and machinery coverage. As part of this arrangement, HSB conducts the inspections on boilers and pressure vessels as required by the Minnesota Department of Labor and Industry at no additional charge.

EQUIPMENT SUBJECT TO INSPECTION

Equipment that falls under state inspection requirements is detailed below.

STEAM BOILERS

Steam boiler

- High-pressure steam boilers operated at a pressure exceeding 15 psig.
- Low-pressure steam boilers operated at a pressure of 15 psig or less.

WATER BOILERS

Water boiler

- High-pressure hot water boilers operated at a pressure exceeding 160 psig or a temperature exceeding 250 degrees Fahrenheit.
- Low-pressure water boilers operating at a pressure not exceeding 160 psig and a temperature not exceeding 250 degrees Fahrenheit.

Exemptions:

- Heating boilers not exceeding a heat input of 750,000 BTU per hour.
- Hot water supply boilers (water heaters) not exceeding a heat input of 500,000 BTU per hour, a water temperature of 210 degrees Fahrenheit, a nominal water capacity of 120 gallons or a pressure of 160 psi.
- Pressure vessels that have an internal or external working pressure not exceeding 15 psig regardless of size

PRESSURE VESSELS

Pressure vessel

- All pressure vessels, including compressed air tanks

Exemptions:

- Heating boilers not exceeding a heat input of 750,000 BTU per hour
- Hot water supply boilers (water heaters) not exceeding a heat input of 500,000 BTU per hour, a water temperature of 210 degrees Fahrenheit, a nominal water capacity of 120 gallons or a pressure of 160 psi
- Pressure vessels that have an internal or external working pressure not exceeding 15 psig regardless of size
- Pressure vessels that do not exceed 5 cubic feet in volume and are equipped with an ASME code stamped safety valve set at a maximum of 100 psig
- Pressure vessels that have an inside diameter not exceeding 6 inches.

For complete rules, members should review the boiler requirements on the Minnesota Department of Labor and Industry website *(DLI.mn.gov)*.

HSB INSPECTIONS

Inspections performed by HSB professionals within the state guidelines are considered a part of coverage, so MCIT members do not see a bill for this service. Inspection of a boiler or pressure vessel outside of the required schedule is the responsibility of the owner of the property.

Following the inspection, the HSB representative completes the required state forms and files them with the appropriate jurisdiction(s).

When conditions are discovered that could result in a serious loss or a jurisdictional code violation, HSB prepares a Loss Prevention Report and provides it to the member and MCIT. Recommendations are categorized as:

- **Code:** A condition that violates jurisdictional boiler and/or pressure vessel requirements and that must be corrected prior to the issuance of an operating certificate by the jurisdiction.
- **Critical:** A condition that could lead to a significant loss if not corrected immediately.
- **Priority:** A condition that could lead to a significant loss, but the likelihood of failure is not imminent. This recommendation is intended to allow members to schedule corrective action in the near future rather than immediately.
- **Advisory:** A condition that has a low probability of loss; minimal impact in the event of failure; or a condition that would not cause a loss but if corrected, would improve the operating efficiency or useful life of the equipment.

Scheduling Inspections

MCIT regularly provides HSB with member locations and contact information to make arrangements for the next inspection. However, members who think they may have a boiler or pressure vessel requiring registration with the state or is currently overdue for an inspection can contact the HSB hotline to schedule an inspection or speak with HSB to answer some questions.

The HSB hotline is **1.800.333.4677** and is answered 9 a.m. to 9 p.m. Monday through Friday. Members can also e-mail questions or schedules to *NSCInsp_Hotline@HSB.com*.

SAFETY SHUT-OFF SWITCH

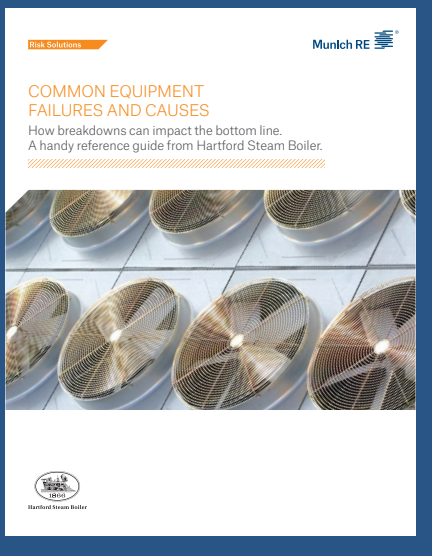
Per state code, a manually operated remote shutdown switch must be located just outside the door to the boiler room and be marked for easy identification. Periodic testing of the shut-off switch should be conducted.

Consideration should be given to the type and location of this switch to safeguard against tampering.

Equipment Breakdown

Although members have coverage for equipment breakdown, it is better to prevent failures from happening in the first place. It saves time, money and hassles to perform regular maintenance than to replace broken electrical equipment, mechanical equipment, air conditioning and refrigeration systems, boilers and pressure vessels, or business equipment and systems.

Hartford Steam Boiler, the provider of MCIT members' equipment breakdown coverage, details the common causes of equipment breakdowns and how that affects the bottom line in its pamphlet Common Equipment Failures and Causes, available through MCIT loss control consultants at **1.866.547.6516** or at *MunichRe.com/HSB.*



BOILER AND PRESSURE VESSEL INSPECTION CHECKUP

ITEM	YES	NO	ACTION ITEM
Is each boiler engineer and operator properly licensed for the equipment overseen?			
Is each operator's license current and conspicuously displayed in the boiler room?			
Are required inspections, maintenance and testing logged as per state regulations?			
Are all required boilers inspected at least annually?			
Are all required pressure vessels inspected at least every two years?			
Is a system in place to ensure that new pressure vessels or other equipment is added to inspection schedules as needed?			
Are safety shut-off switches installed as required, and are they periodically tested?			