

Inspection and Technical Services

Pressure Equipment Graded Inspections

ITS 22-004

On, June 8th, 2020, Inspection Technical Services (ITS) implemented an interval grading system for periodic inspections of pressure equipment within Manitoba. Previously, ITS conducted periodic inspections for pressure equipment – boilers and refrigeration equipment were inspected annually while pressure vessels were inspected every two years.

The new interval grading system will consider a number of factors when determining inspection intervals, including:

- Equipment Types and Styles
- Risk-Based Inspection Assessments
- Associated Standards and Publications Referenced for Determining Inspection Intervals
- Impact of Certificate of Authorization programs
- Life Cycle Safety of Pressure Equipment

Pressure equipment will be assigned an inspection interval of either grade 1 or grade 2. Initially, all pressure equipment will be assigned a grade 1 inspection interval. Following a minimum of two in-service inspections under the grade 1 interval, equipment may become eligible for assignment under a grade 2 inspection interval dependent on the condition of the equipment and level of deficiencies noted at the time of inspection. It is important to remember that the duration of grade 1 or grade 2 is dependant on the equipment type and category, and is a maximum.

The following table illustrates the equipment type, category and the duration of Grades 1 and 2, and the maximum inspection interval.

Table 1 - Inspection Intervals for Pressure Equipment

#	Equipment Type	Category	What will be seen on a Grade 1 Invoice	Grade 1 (max. years)	Grade 2 (max. years)
1	Power Boiler (PB)	All power boilers	Power Boilers - All - 1 yr	1	2
2	Heating Boiler (HBCF)	Coil or Finned Tube Design	HB - Fin Tube Coil - 2 yr	2	4
3	Heating Boiler (HB)	All other heating boilers	HB - Non-Fin Tube Coil- 2 yr	2	3
4	Portable Boiler	All portable boilers	Portable Boilers - All - 1 yr	1	-
5	Pressure Vessel (PV)	Deaerator	PV - Deaerator - 5 yr	5	-
6	Pressure Vessel (PV)	Noncorrosive*	PV - Noncorrosive* - 5 yr	5	10
7	Pressure Vessel (PV)	Designed to A.S.M.E. Section VIII - Div. 2	PV - Sec. VIII Div 2 - 3 yr	3	5
8	Pressure Vessel (PV)	Exploration and Production - Low Risk**	PV-Exp & Pro Low Risk** - 5 yr	5	10
9	Pressure Vessel (PV)	Exploration and Production - High Risk***	PV-Exp & Pro High Risk***-3yr	3	5
10	Pressure Vessel (PV)	Equipped with Quick Opening Closures	PV - Quick Closures - 4 yr	4	-
11	Pressure Vessel (PV)	Portable / Temporary Vessels	PV - Port/Temp Vessel - 5 yr	5	-
12	Pressure Vessel (PV)	Air Receivers	PV - Air Receiver - 5 yr	5	-
13	Pressure Vessel (PV)	All other categories	PV - General - 5 yr	5	-
14	Refrigeration (R)	Group A1 Refrigerant	R - Group A1 refrig - 3 yr	3	5
15	Refrigeration (R)	Group B2 Refrigerant and those required to have Class T Machinery Rooms	R- Group B2/Class T req'd-1yr	1	5
16	Refrigeration (R)	All other categories	R - General - 2 yr	2	5

- : Ineligible for Grade 2 Interval
 Noncorrosive* : LPG, Cryogenic, hydrocarbon gases methane, ethane, propane, butane and their combinations including natural gas.
 Low Risk** :Well Head Vessels (separators, methanol spheres, etc.) Fuel Gas scrubbers, Air Cooled Heat Exchangers
 High Risk*** : Indirect Fired Line heaters, Treaters, FWKO, Compressor Bottles in Vibrating service, Upstream Pressure Vessels in sour / sweet service

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Inspection Intervals

An initial inspection (new installation or recurring) will be completed to identify any deficiencies in the design, construction, or installation, and to ensure the safe operation of the equipment. Following a successful inspection, pressure equipment will be assigned a grade 1 interval and the owner will receive a Manitoba Inspection Certificate with the new expiry date indicated.

A grade 1 interval may be assigned to pressure equipment:

- That is newly commissioned;
- Where an owner exercises sufficient diligence to ensure the safe operation of the equipment being inspected; or
- Where the inspection revealed only minor deficiencies.

As indicated in table 2, all equipment types subject to an initial inspection may result in a grade 1 interval if the inspection reveals a unit:

- Is found in operation;
- Is altered; or
- Experienced a significant change within operating conditions (fluid service, operating temperature, pressure, cycles, etc.).

Table 2 - Inspection Intervals for Pressure Equipment

Equipment Type	Category	What will be seen on an Invoice & Certificate	Grade 1 (max. years)
ALL	CHANGE IN SERVICE	CHANGE IN SERVICE - BOILER	1
ALL	CHANGE IN SERVICE	CHANGE IN SERVICE - PV	1
ALL	FOUND IN OPERATION	FOUND UNIT - BOILER	1
ALL	FOUND IN OPERATION	FOUND UNIT - PV	1

Equipment will be assigned a grade 1 interval once the owner demonstrates safe operation of the equipment.

Following two successful in-service inspection intervals under a grade 1 interval, either

- New Installation inspection and a recurring inspection, or
- Two recurring inspections

The owner of eligible pressure equipment may request a grade 2 reassignment inspection.

A grade 2 interval may be assigned to pressure equipment:

- If the owner is in good financial standing with ITS;
- If the last in-service inspection revealed the safe operation of pressure equipment;
- If the last in-service inspection revealed no significant safety issues resulting in an order to correct; and
- If the last in-service inspection determined that periodic inspections can be safely assigned under grade 2 requirements (considering the maintenance, operation and overall safety of equipment and site)

Graded Inspections will not apply to the following units:

- Historical Steam Traction Boiler; and
- Historical Portable Steam Boiler

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Applying for a Grade 2 Interval

Owners or owner representatives who wish to participate under a grade 2 interval shall complete the *ITS BPV Form 13 – Application for Grade 2 Interval* and email, along with all required attachments, to BPVIntake@gov.mb.ca.

The owner or owner representative shall complete the checklist on the application form. Results to one or more questions on the application may result in additional requirements, including, but not limited to:

- Non-destructive examination
 - Non-destructive testing personnel shall be certified in accordance with CAN/CGSB-48.9712/ISO 9712 or other standards acceptable to the regulatory authority.
- Fitness for service (FFS) evaluation report
 - A.S.M.E. FFS-1 covers fitness-for-service assessment procedures for evaluating commonly encountered flaws
 - NBIC part 2, Section 4.4 covers methods to assess damage mechanisms and inspection frequency or pressure-retaining items
 - To be completed by a Professional Engineer

In addition to completing the checklist, the owner or owner representative shall attach the following documents:

- All Repair and Alterations completed;
 - Manitoba Boilers and Pressure Vessels Repair and Alteration Reports, ITS ES Form - 01
- Maintenance Reports;
 - Completed by a maintenance company with licenced personnel. i.e. Gas fitter licence.
 - Include operating history or logging if available
- List of Power Engineers, Class of Certificate, licence number (if applicable)

Grade 2 application packages shall be submitted 30 days prior to the expiration date indicated on the Inspection Certificate or additional fees may apply.

The following table indicates the eligible equipment type, category and the maximum duration of the Grade 2 interval:

Equipment Type	Category	Invoice Description	Grade 2 (max. years)
Power Boiler (PB)	All power boilers	Power Boilers - All - 2 yr	2
Heating Boiler (HBCF)	Coil or Finned Tube Design	HB - Fin Tube Coil - 4 yr	4
Heating Boiler (HB)	All other heating boilers	HB - Non-Fin Tube Coil - 3 yr	3
Pressure Vessel (PV)	Noncorrosive*	PV - Noncorrosive* - 10 yr	10
Pressure Vessel (PV)	Designed to A.S.M.E. Section VIII - Div. 2	PV - Sec. VIII Div 2 - 5 yr	5
Pressure Vessel (PV)	Exploration and Production - Low Risk**	PV-Exp & Pro Low Risk** - 10 yr	10
Pressure Vessel (PV)	Exploration and Production - High Risk***	PV-Exp & Pro High Risk***-5yr	5
Refrigeration (R)	Group A1 Refrigerant	R - Group A1 refig - 5 yr	5
Refrigeration (R)	Group B2 Refrigerant and those required to have Class T Machinery Rooms	R- Group B2/Class T req'd-5yr	5
Refrigeration (R)	All other categories	R - General - 5 yr	5

Noncorrosive* : LPG, Cryogenic, hydrocarbon gases methane, ethane, propane, butane and their combinations including natural gas.
 Low Risk** :Well Head Vessels (separators, methanol spheres, etc.) Fuel Gas scrubbers, Air Cooled Heat Exchangers
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Owner's Responsibility

It is the owner's sole responsibility to ensure their pressure equipment is operating in a safe manner. For guidance on industry practice, please review **A.S.M.E. Section VI and VII, Care and Operation of Heating Boilers and Care and Operation of Power Boilers**. In addition, the owner shall ensure that all pressure relief devices (PRD), instrumentation and controls required to safely operate the pressure equipment are examined and tested periodically and annually. CSA B51 Clause 12 and NBIC Part 4 indicate information regarding the inspection and servicing of PRDs.

The owner shall submit annually the following documents to BPVintake@gov.mb.ca:

- All maintenance reports;
- Operating history;
- Repairs and Alterations performed;
- Change in personnel (if applicable);
- PRD reports

A violation in the above or evidence of unsafe operation will lead to Grade 1 reassignment, automatic removal from the Grade 2 interval. If a grade 2 interval is revoked, the owner or owner representatives will need to demonstrate the ability to safely operate their equipment at a Grade 1 interval for another 2 inspection periods. Only then, an owner may reapply for a Grade 2 interval.

For more information regarding the graded interval program, please contact Inspection Technical Services.