Manitoba

# Inspection and Technical Services

## Piping Registration Submission Guideline

ITS ES Guide 01

Inspection and Technical Services (ITS) has provided this guideline to aid in the submission for Piping Registrations and explains the responsibility of the owner, professional engineer and contractor installing the piping.

Specific documentation is required to be submitted for Pressure Piping registrations. Please review and read the entire document.

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# 1.0 General Pressure Piping information

The scope of ITS for piping is piping connected to a boiler or pressure vessel as described in the Steam and Pressure Plants Act and Regulation. This includes all temporary piping, piping installations mounted in sea cans, trailers and skids.

All pressure piping shall be designed and sealed by a Professional Engineer with the appropriate scope of practice. All pressure piping shall be designed to, and meet the requirements of, one of adopted codes as noted below.

## 1.1 Applicable codes

The Steam and Pressure Plants Regulation 108/87R adopts the following Codes which govern the construction, installation, examination and inspection of pressure piping within Manitoba:

a) CSA-B51 Boiler, Pressure Vessel and Pressure Piping Code
b) CSA-B52 Mechanical Refrigeration Code
c) ASME B31.1 Power Piping
d) ASME B31.3 Process Piping
e) ASME B31.5 Refrigeration Piping and Heat Transfer Components
f) ASME B31.9 Building Services Piping
g) ANSI/CGA G-2.1 Requirements for the Handling of Anhydrous Ammonia

ITS Does not regulate:

a) CSA-Z662 - The Oil and Pipeline Standard. Piping that follows this code is regulated by the Manitoba Petroleum Branch Please see https://www.gov.mb.ca/iem/petroleum/pdirectory/index.html
b) CSA-Z7396.1 – Medical Gas Pipeline Systems see bulletin **ITS 20-014**
c) Hydraulic Piping – The Steam and Pressure Plants Act and Regulation does not cover Hydraulic piping or codes and standards for construction of Hydraulic piping systems.

## 1.2 Who can Construct and Install Pressure Piping

**In Manitoba**:
Pressure piping must be assembled and installed by an organization that:

a) Has a Quality Control (QC) Program registered with ITS.
   The scope of the Certificate of Authority must include the specific ASME B31 code the piping is designed to; and
b) If welding or brazing is involved in the construction the weld/braze procedures must be registered with ITS; and
c) Employs welders or brazers with Manitoba licences.

**In Canada**:
Pressure piping must be fabricated by an organization that:

a) Has a valid QC Program registered with Jurisdiction where the work is taking place. The scope of the Certificate of Authority must include the specific CSA / ASME B31 code the piping is designed to; and

b) If welding or brazing is involved in the assembly of the piping, the weld/braze procedures must be registered with Jurisdiction where the welding is taking place.

See Section *4.1 Piping Built in another Province* for more details.

**Outside of Canada:**
ITS only accept manufacturers holding an ASME PP stamp (Pressure Piping) or subject to approval from ITS, manufacturers who hold another ASME Stamp. **Fabricators located outside of Canada without an ASME Stamp will not be accepted.**

See section *4.2 Piping Built outside of Canada* for more details.

## 1.3 When is Piping Registration Required

A piping installation considers all the aggregate volume of multiple piping systems installed for a particular job whether it is new, replacement or temporary. Registration of piping systems is required when the volume of all the piping systems is over 17cu.ft. of internal volume.

ITS has provided example scenarios at the end of this bulletin in Appendix A

## 1.4 When is Piping Registration Not Required

Piping installations under 17cu.ft of internal volume does not require registration. This piping is subject to inspection, and the construction and installation must follow QC requirements as per section 3.2 or section 4.0.

Piping that is not connected to a boiler or pressure vessel does not require registration or inspection. The steam and pressure plants act provides some exemptions see section 1.4.1 below.

### 1.4.1 Exemptions from the Act:

In order for a pressure piping installation to be exempted from registration and inspection it must meet the following as per the Steam and Pressure Plants Act:

a) *Pressure Plant* Exemptions:
   i. those that have a capacity of less than 1 1/2 cubic feet, and
   ii. those that are operated subject to a pressure less than 15 pounds to the square inch;

b) *Steam Plant* Exemptions:

i. Those that develop less than three boiler horse power.

ii. Those that are used for heating a building designed and constructed as a private residence intended to house not more than one family, and

iii. Those that are used for heating a building used solely for residential purposes and containing not more than two separate apartments or suites;

### 1.4.2 Refrigeration Piping:

Refrigeration piping having a capacity of at least 13.6078 t (15 tons) and under; and meets the requirements of *CSA B52 Section 5.2 Refrigeration Systems rated 125kW or less:*

*"Refrigeration systems (including piping and all categories of fittings and excluding pressure vessels) may be exempt from registration, provided that the following conditions are met:*

*a) the refrigeration system has a prime mover nameplate rating of 125 kW or less. If more than one system is installed in a single location,*

*i) the systems are independent of each other and not connected with a common header or others means such that failure of one system will not impact on another system; or*

*ii) if the systems are interconnected, the total of all prime movers added together does not exceed 125 kW; and*

*b) the refrigeration system is covered by the following Standards and is tested and certified by an approved testing laboratory:*

*i) CAN/CSA-C22.2 No. 60335-2-24;*

*ii) CAN/CSA-C22.2 No. 60335-2-40;*

*iii) CAN/CSA-C22.2 No. 60335-2-89 or CSA C22.2 No. 120; and*

*iv) CSA C22.2 No. 128."*

***NOTE:*** All other provisions of CSA B52 Standard shall be complied with if no registration is required, including the total quantity of refrigerant per occupied space, occupancy classification, and the use of a machinery room.

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## 2.0 Responsibilities of the Owner, Engineer and Contractor:

This section describes the responsibilities specific to the owner of the piping system, the engineer that stamps the drawings and the contractor responsible for fabricating and installing the piping.

Registration application documents can be submitted by either the owner, the engineer responsible for the design, or the contractor installing the piping. It is recommended that the designing engineer make the application for piping registrations.

## 2.1 Owner is responsible to:

a. Ensure the design engineer has the appropriate scope of practice and the necessary experience in pressure piping design.
b. Ensure the contractor has the required Certificate of Authorization
c. The owner of a piping installation shall have overall responsibility for compliance with the selected ASME Code
d. The owner may designate a representative to carry out selected responsibilities required by the selected ASME Code, but the owner retains ultimate responsibility for the actions of the representative.
e. The owner may be required to designate an Owner's Inspector, who is responsible to the owner for ensuring that the requirements of the selected ASME Code for inspection, examination, and testing are met.

## 2.2 Professional Engineer certifies and is responsible for:

a. That the design meets the Steam and Pressure Plants Act and Regulation.
b. Ensures the piping meets the requirements of CSA B51/CSA B52 and the applicable ASME B31 code.
c. Ensures that the assigned ASME B31 Code is appropriate and listed on the applicable drawings
d. Reviews and approves the following:
    i. Calculations
    ii. Materials specified for piping are appropriate
    iii. Appropriate class of fittings are specified
    iv. Boilers, pressure vessels, Heat exchangers are appropriate for the design conditions.
    v. Identifies test procedures (hydrostatic or pneumatic) and provide technical reasoning and site specific plan for pneumatic testing.
e. Make the application and submit all required documentation for piping registrations (as applicable)
f. Respond to any technical inquiry made by ITS to clarify design requirements.

## 2.3 Contractor is responsible to:

a. Maintain a valid QC Program registered with ITS.
b. Ensure their Certificate of Authorization has the correct scope for the current work being performed.
c. Where applicable have registered welding or braze procedures.
    - If any portion of the work is being subcontracted ensure subcontractor has registered QC program with ITS and registered welding/braze procedures (as applicable)
d. Employ only Manitoba licensed welders and brazers.
e. Ensures the engineer that stamped the drawings approved the above noted items listed in Section 2.2.
f. Ensuring the boilers, pressure vessels, heat exchangers, and fittings they are installing or connecting to, have a valid Manitoba CRN.
g. Ensuring piping heat numbers are maintained and piping is identified.
h. Maintain and retain a QC package for the piping installation as prescribed in their QC manual registered with ITS. See Section *3.2 Documentation for Construction.*

## 3.0 Documentation Requirements for Piping Systems:

This section describes the QC documentation required for registration and construction. The documentation described below shall be retained in the contractor's files for the period prescribed in the applicable ASME Piping code. This applies to all installations regardless of size or registration requirements.

### 3.1 Documentation for Registration

Registration documents can be submitted by either the owner, the engineer responsible for the design, or the contractor installing the piping. Below describes each of the documents needed.

a) ITS ES Form – 02 - CRN Design Registration Application Form

The new CRN registration application form has combined all the previous forms (BPV form, fittings, and piping) into one fillable form. Additional application forms are needed if there are multiple installers and/or manufacturers. If there are multiple organizations involved, documentation must be provided to show the scope of each organization.

b) Line List:

The line list shall state every pressure piping system that will be installed, regardless of volume. The following fields must be identified:

i. Line/tag numbers
ii. Line Size
iii. ANSI/ASME material specification. ( SA-106B, A53)
iv. Piping thickness
v. Design pressure
vi. Design temperature
vii. Class of fittings used
viii. Test pressure (hydrostatic or pneumatic).
ix. NDE, if required by ASME B31 code of construction.

c) List of Pressure Safety Valves (if applicable):

i. Component manufacturer, whether NBIC or ASME certified, and safety relief setting.
ii. Calculations for relieving capacity can be stated or in the calculation package as per item 6 below.

d) Listing of all CRN registered boilers, pressure vessels and non-standard fittings installed.

e) ITS ES Form 04 – General Engineering Requirement Field Constructed Piping

f) Flow or Line Drawings of the general arrangement for the pressure piping system only.

i. Drawings Requirements at a minimum:

- Stamped and Reviewed by a Professional engineer.
- Drawings shall state code designed and built to i.e. ASME B31.9, B31.5, B31.3, etc.
- Include the symbol and line legends
- Markups on drawings will not be accepted.

ii. Refrigeration System drawings requirements are to follow the requirements above and to also follow CSA-B52 5.3.2 *Contents of Drawings:*

*"Each drawing shall include, at a minimum, the following:*
*a) type of occupancy;*
*b) refrigerant: group number, name, and weight of charge in system;*
*c) machinery room: construction details, including ventilation if applicable;*
*d) position of equipment;*
*e) size, run, material, and type of piping;*
*f) compressors: manufacturer, displacement, setting of relief valves, and prime mover power rating;*
*g) pressure vessels: size, Canadian registration number, and data reports;*
*h) existing machinery: full particulars, where applicable; and*
*i) safety devices: relieving pressures, manufacturer's name, and size and number of safety valves,relief valves, and rupture members."*

g) Calculations

i. Calculations (as per the selected design code as applicable) to show that the selected piping material and thicknesses are suitable for the design pressure and temperature.

ii. Calculations for relieving capacity. See CSA B51 Para 12.2.1.2 or B52 Para 7.3.4.

## 3.2 QC Documentation for Construction:

Documentation is required for all piping systems within the scope of the Manitoba Steam and Pressure Plants Act. This documentation shall be prescribed in the contractors registered QC manual with ITS. In addition to the documentation listed in 3.1, the organization shall maintain a record of the following documents for the period prescribed in the applicable ASME Piping code.:

a) Piping Construction data report (as found in CSA B51), signed off and dated
b) MTR's, data reports for all piping, fittings, boilers, pressure vessels, and heat exchangers.
c) Weld map if piping joints were not stamped by the welders.
d) Pressure test report (Hydrostatic or Pneumatic) Documented evidence of valid technical reason, and site specific plan for pneumatic testing.
e) NDE reports (if applicable)
f) Copy of welder licenses.
g) Engineer Stamped Drawings

# 4.0 Piping Construction outside of Manitoba

This section describes the additional QC documentation required for all piping systems built outside of Manitoba. The documentation described below shall be forwarded to the owner, and where required the Jurisdiction. This applies to all installations regardless of size or registration requirements.

## 4.1 Piping built in another province

Piping systems, skids or spools may be built in another province. In addition to the documents required for piping registrations listed in Section 3 above, the construction company must have a Certificate of Authority issued by the Provincial jurisdiction where fabrication is occurring with the appropriate scope for the current work.

Piping over 17cu.ft shall be registered prior to fabrication. Refer to Appendix A for examples.

### 4.1.1 During Fabrication - Prior to Shipment

i. The piping will have to be inspected by the jurisdictional inspector in the province of fabrication
ii. Piping will be subjected to a pressure tests witnessed by the inspector
iii. Construction data report signed by the jurisdictional inspector in the province of fabrication
iv. All piping, fittings, boilers, pressure vessels and fittings are labelled with the heat numbers, CRN, welder stamp, weld map, etc.

### 4.1.2 Documents required to be sent to the Installation site:

i. Copy of Certificate of Authorization
ii. Construction data report signed off by the jurisdictional inspector
iii. MTR's, data reports for all piping, fittings, boilers, pressure vessels, and heat exchangers.
iv. Weld map if piping joints were not stamped by the welders.
v. Pressure test report
vi. NDE reports (if applicable)
vii. Copy of welder licenses.

## 4.2 Piping built outside of Canada

All piping built outside of Canada the design, materials, construction, inspection and testing of pressure piping shall meet the requirements of the ASME piping codes adopted in the Steam and Pressure Plants Regulation. ITS will only accept manufacturers holding an ASME PP stamp (Pressure Piping) or subject to approval from ITS, manufacturers who hold another ASME Stamp. **Fabricators located outside of Canada without an ASME Stamp will not be accepted.**

A CRN must be issued by ITS for the piping **before** construction begins. For the documentation required to register piping built outside of Canada see Section 3.1 and additional documentation requirements in Section 4.2.1 below.

### 4.2.1 Additional Documentation before Construction begins

Piping over 17cu.ft shall be registered prior to fabrication.

In addition to the documentation required in Section 3.1, the following information must be provided at the time of application:

i. Copy of the ASME Certificate of Authorization
ii. Identify the authorized inspection agency who will perform in-process inspections
iii. Identify the National Board commissioned Authorized inspectors
iv. Ensure all welding and brazing procedures are in accordance with ASME IX Welding, Brazing and Fusion Qualifications
v. Submit qualification records for each Welder or Brazer. Documents shall be in accordance with ASME IX
vi. Provide qualifications of non-destructive examination personnel involved in the testing of the piping system. The NDE personnel shall be certified in accordance with CAN/CGSB-48.9712/ISO 9712 or other standards acceptable to the regulatory authority.

### 4.2.2 During Fabrication - Prior to Shipment

During fabrication and prior to shipment of the piping, the following items must be completed:

i. The piping requires inspection by an National Board commissioned Authorized inspector
ii. Piping is subject to a pressure test witnessed by the Authorized Inspector
iii. Completed ASME piping construction data report or CSA-B51 piping construction data report for piping signed off by an Authorized Inspector
iv. All piping, fittings, boilers, pressure vessels and fittings are labelled with the heat numbers, CRN for Manitoba, welder stamp, weld map, etc.

### 4.2.3 Documents required to be sent to the Installation site:

When the items above are complete the following QC documentation package shall be provided to site of installation for the installing contractor and ITS inspector for review and acceptance:

i. Copy of Certificate of Authorization
ii. ASME Piping Construction data report, signed off by an Authorized Inspector.
iii. MTR's, data reports for all piping, fittings, boilers, pressure vessels, heat exchangers.
iv. Weld map if piping joints were not stamped by the welders.
v. Pressure test report
vi. NDE reports (if applicable)
vii. Copy of welder and brazer performance qualification records.

## 5.0 How to submit Pressure Piping Registration Packages

For additional information on how to submit documentation electronically, please refer to bulletin **ITS 20-003.**

- Submit the required documents by email to QASupport@gov.mb.ca with the subject line:

  **"New Design Review – Piping Email 1/1"**

- One email per application. If all documents cannot be attached to a single email (size limitations), the submission may be broken into more than one email. The subject line should be clear there are multiple emails – **Email 1/2 etc**.
- Files shall be directly attached to the email; web links to file sharing sites are not acceptable.
- Files shall be **PDF files** (20MB max) and **separated by content type** (Drawings only, calculations only, etc.)
- **Each PDF clearly labeled to indicate contents**
- All pages shall have the same orientation, i.e. all portrait or all landscape.
- PDF files **cannot be locked/protected** to prevent ITS from signing and stamping.
- Upon successful review, applicants will receive emailed stamped and signed documents.
    - **NOTE:** No hard copies will be mailed, only electronically signed registration letters and the main drawing will be stamped by ITS.

## 6.0 Booking Inspections with ITS:

All piping installations meeting the scope of the Manitoba Steam and Pressure Plants Act are subject to inspection. When booking your piping installation inspection please give 2 weeks notice. Do not send your inspection booking request to the email for registration applications.

To book your inspection:

- Email bpvintake@gov.mb.ca
- Subject line "Piping Installation Inspection Request for "*Insert Installation Name"*
- In the body of the email at a minimum provide:
    - Name and address of installation
    - Indicate the preferred date range for the inspection
    - Site contacts Name, phone number and email.
    - Piping installation traveller
    - Attach gas or oil permit if applicable/available

# Appendix A - Examples of Installations

A piping installation considers all the piping systems installed for a particular job whether it is new, replacement or temporary. Below are some examples of some possible scenarios of what needs to be registered and inspected. This may not cover every situation.

| System | Example 1 New Install ($ft^3$) | Example 2 New Install ($ft^3$) | Example 3 New Install ($ft^3$) | Example 4 Replacement ($ft^3$) | Example 5 Replacement and New ($ft^3$) | Example 6 Temporary and New ($ft^3$) |
|---|---|---|---|---|---|---|
| Steam | 10 | 20 | 5 | - | 10 (Replaced) | 4+4 (Temp and New) |
| Hot water | 10 | 5 | 5 | 15 | 4 (New) | - |
| Chilled Water | 10 | 5 | 5 | - | - | - |
| Compressed Air | 5 | 5 | n/a | - | 4(New) | - |
| Total Cu.Ft. | 35 | 35 | 15 | 15 | 18 | 8 |

*Example 1:* All piping systems are under 17 cu.ft. of internal volume, but the installation total is over therefore installation needs to be registered and all systems are required to be included in the registration package and the pressure piping is subject to inspection and all documentation created and retained as per 3.1 and 3.2.

*Example 2:* One piping system is over 17cu.ft of internal volume, and the other systems are not. All systems are required to be included in the registration package and the pressure piping is subject to inspection and all documentation created and retained as per 3.1 and 3.2.

*Example 3:* All systems are under 17cu.ft. and total is under 17cu.ft. of internal volume. Therefore no registration is needed **but** the pressure piping is still subject to inspection and all documentation created and retained as per 3.1 and 3.2.

*Example 4:* Piping system replacement is under 17cu.ft. of internal volume, and there are no other systems installed. Therefore no registration is needed **but** is still subject to inspection and all documentation created and retained as per 3.1 and 3.2.

*Example 5:* All piping systems are under 17 cu.ft. of internal volume, but the installation total is over therefore installation needs to be registered and all systems are required to be included in the registration package and the pressure piping is subject to inspection and all documentation created and retained as per 3.1 and 3.2.

*Example 6:* Rental Boiler installed with temporary and new piping. Total piping installed is under 17cu.ft of internal volume, therefore no registration is needed for both the temporary and new piping **but** is still subject to inspection.

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