

Pressure Piping Registration

This circular details the requirements for the registration of designs of pressure piping systems for use in British Columbia. It is not intended to be a substitute for the governing [Act, General Regulation](#), specific [Regulation](#), codes and documents. For a full list of adopted codes, refer to [Boiler, Pressure Vessels and Refrigeration Regulation – Adopted Codes and Standards](#).

Pressure piping systems are a series of pipes, tubes, conduits, gaskets, bolts and other components, the sole purpose of which is the conveyance between two points, of

- a) an expansible fluid, or
- b) a non-expansible fluid or thermal fluid with a working pressure exceeding 1100 kPa or an operating temperature exceeding 121 °C

Failures of pressure piping components can lead to serious harm. It is the responsibility of the pressure piping designer to understand the intended operating conditions, installation interfaces, and the environment into which the pressure piping will be installed to assure safe operation throughout the pressure piping system's life-cycle. Designers shall have:

- The appropriate qualifications to perform the design work
- Exercised good design judgement, through
 - use of recognized standards
 - evaluation of the effects of loading consistent with the intended installation environment
 - evaluation of the effects of the operating system or process
 - application of appropriate interface loading assumptions
- Documented their design, its limitations (pressure, temperature, interface loads) and its compliance to the *Regulation* (code or standard)
- Assumed responsibility for the integrity of their design

Registration provides owners, operators and members of the BC public with confidence that a design is safe for use within BC. The registration of a pressure piping system does not relieve the equipment manufacturer of the liability for the design and construction of the system.

EXEMPTIONS

1. The following pressure piping systems are exempt from the *Regulation*:
 - a) pressure piping external to a boiler proper in a low pressure low temperature fluid plant that operates at a working pressure of 206 kPa or less and a temperature of 100 °C or less, or
 - b) pressure piping operating at and with a pressure relief valve set at 103 kPa or less
2. Design of pressure piping NPS 3 or smaller is exempt from registration however, the system must comply with all regulation and code requirements.

SUBMISSIONS

3. All submissions must contain hard copies of
 - a) a completed BC [Design Registration Application \(CRN/PRN/BCLD\) Form 1171](#)
 - b) 1 copy of drawings and corresponding line lists (refer to items 4 and 5 below),
 - c) 1 copy of ASME code calculations for expansion, flexibility, and support for pipe diameters exceeding NPS 3 (item 7).

DRAWINGS AND LINE LISTS

4. Drawings (flow diagrams, P&IDs) must include the following:
 - a) number and revision
 - b) design code of construction information - edition and addenda (e.g. ASME B31.1-2010)
 - c) line identification that can be correlated with item 5 below.
 - d) CRN's for boilers, pressure vessels and fittings in the system.

Note: Bridles shall be registered as "Fitting" or "Pressure Vessel", as applicable, and the CRN shall be included with the submittal.

5. Line lists showing the maximum design pressures, maximum and minimum design temperatures, and relevant specifications (as per item 6 below) for each line

Note: All lines requiring registration should be highlighted on both the drawing and line lists.

SPECIFICATIONS

6. Pipe specifications shall indicate the following:

<ol style="list-style-type: none">a) maximum design pressureb) maximum and minimum design temperaturesc) fluid serviced) dimensionse) ASME material specificationsf) flange, valve, and fitting standardsg) heat treatment	<ol style="list-style-type: none">h) non-destructive examination requirements (MT, PT, RT, VT, UT, LT)i) corrosion allowancej) impact testingk) pressure test conditions, fluidl) formulas used or reference to code section
--	--
7. Stress analysis calculations shall demonstrate the piping system can withstand or is isolated from all ambient influences, dynamic effects, weight effects, and interface loads, as defined in ASME B31-series code. If these conditions are unknown, clearly stated worst-case loading restrictions shall be included (e.g. seismic value $S_a(0.2)$ was chosen to be 0.095 as installation is in Fort St. John). You must demonstrate the following:
 - a) The design can withstand the maximum pressure and maximum and minimum temperatures with an identified factor of safety
 - b) Identify all loads on the pressure piping system and worst-case loads
 - c) The design can withstand the loading environment described in 6(b).

All of the effects must be considered. If a certain effect or load does not apply to your application, provide justification through statements or calculations (e.g. wind calculations do not apply as the installation will be indoors).

Note: Pressure piping registrations may have notes added to the registration letter that states limitations due to the designer's worst case loading conditions

MODIFICATIONS TO EXISTING LINES

8. Calculations shall be provided for any existing lines that are modified to accommodate new lines to show



- a) there are no additional interface loads introduced between the new and existing lines, or
- b) the existing lines are adapted to support any new loads as a result of the modification

GENERAL INFORMATION

9. Upon an acceptance review of the piping system design registration documentation, a design registration letter will be sent to the applicant, indicating the BC piping registration number (site specific P number), date of registration, description of the piping system, installation site, drawing numbers, and any conditions or limitations. A separate invoice will be forwarded for the registration fee.
10. Registration of a pressure piping system design does not constitute an acceptance of the installation or operation. BC Safety Authority may have additional requirements for installation and/or operating permits. BC Safety Authority recommends installers/owners of pressure piping systems visit the BC Safety Authority [website](#) or contact center (1.866.566.7233 – contact@safetyauthority.ca) to determine if any other permits are required.
11. For inspection requirements: refer to http://www.safetyauthority.ca/sites/default/files/Inspection_Requirements_for_Piping_Systems_Piping_Components_D-BP_2011-01_Rev_01_.pdf

