



Reference Tool for Interpreting Pipeline Pressure Control and Overpressure Protection Requirements

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ALBERTA ENERGY AND UTILITIES BOARD
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Introduction

This tool clarifies the requirements of *Canadian Standards Association (CSA) Z662-03: Oil and Gas Pipeline Systems*, Clause 4.14.1, which states that if a pipeline may be subjected to pressures greater than its maximum operating pressure (MOP) from any source, there must be both pressure control and overpressure protection for the line. The intent is that if the pressure control were to fail, overpressure protection equipment would prevent the lower MOP pipeline pressure from being exceeded by more than 10 per cent or 35 kilopascals (kPa), whichever is greater. The design must be based on maximum licensed operating pressure, regardless of normal operating pressure.

Pressure control can be set to no higher than the maximum of the lower MOP. Overpressure protection can be set to a maximum of 10 per cent or 35 kPa (whichever is greater) above the lower MOP. Overpressure protection may consist of pressure-limiting or pressure-relieving systems or both, as long as they continuously and automatically protect the pipeline from being pressured above the predetermined value.

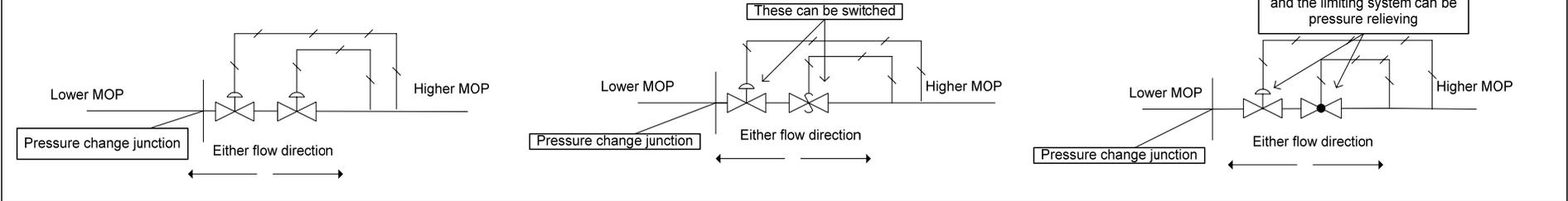
If pipelines have mismatched MOPs, the *Pipeline Regulation* (Section 22[2]) allows for a mismatch of up to 5 per cent of the lower MOP without requiring pressure control and overpressure protection.

The following diagrams clarify what is considered suitable in accordance with *CSA Z662-03*, Clause 4.14.1.

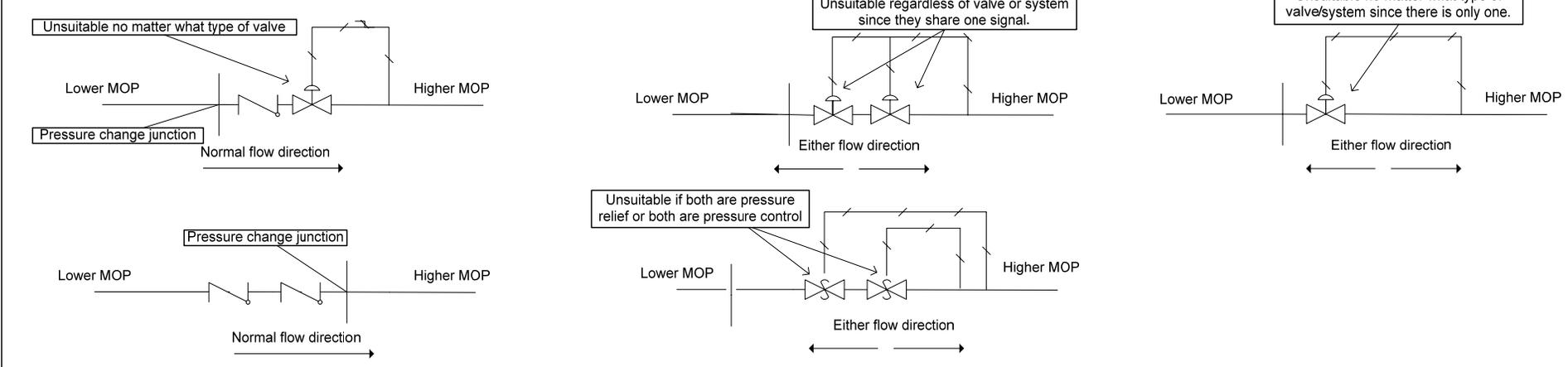
User Notes

- The suitable cases shown in the diagrams on the next page are a guide; they are not universally acceptable. For example, excessive distances between the valving and pressure junctions may compromise protection due to pressure gradients. There could be other conditions that may also render the systems unsuitable.
- All sources from which overpressure may occur must be taken into account. For the purpose of these diagrams, it is assumed that other suitable upstream pressure control equipment is in place.
- Pressure safety valves (PSVs) or pressure relieving devices on separators may be acceptable as overpressure protection, provided that the separator cannot be isolated from the pipeline during operation and the distance from the pressure change junction to the separator is not large enough to cause a pressure gradient capable of overpressuring the line. Also note that PSVs do not qualify as pressure control.
- Check valves are in no way considered suitable as a measure of pressure control or overpressure protection, even if installed in tandem. This has been clarified by CSA in its published interpretation, which is available on the CSA Web site at http://www.csa-intl.org/pdf/infupdate/2004-6/2004-6_Energy.pdf.
- The suitable examples reflect typical systems and are to be used only as a guideline. Certain exceptions or restrictions may be warranted based on the circumstances and facility layout. Every system should be evaluated carefully, considering all possible modes of operation.

SUITABLE CASES



UNSUITABLE CASES



Legend



Pressure Relieving

A device or system that automatically operates to limit or lower piping pressure through dumping, flaring, or blowing down fluid into containment or the atmosphere. These can be set to a maximum of 10% or 35 kPa (whichever is greater) above the lower MOP.

Examples: pressure-activated blowdown valves, pressure-relief valves, or rupture discs/pressure safety valves. They may or may not have pressure signals but must be automatic.



Pressure Signal

This is illustrated here mainly to indicate that separate pressure signals are required for each of the systems to activate where applicable. PSVs and some other devices do not necessarily require them. They must be set to activate according to the criteria in this legend.



Check Valve

There are many variations of check valves available, but CSA has interpreted them to be unsuitable for pressure control or overpressure protection applications.



Pressure Control

A device or system that regulates or limits pressure, either automatically or by continuous monitoring with manual intervention. These can be set no higher than the maximum of the lower MOP.

Examples: systems with pressure regulators, pressure-control valves, speed control of a pump or compressor, or a SCADA system with prompt manual intervention to control the pressure.



Pressure Limiting

A system or device that automatically reduces, restricts, or shuts off fluid flow in order to prevent pressure exceedance. If being used for pressure control, these can be set no higher than the maximum of the lower MOP. If being used as overpressure protection, these can be set to a maximum of 10% or 35 kPa, (whichever is greater) above the lower MOP.

Examples: pressure activated on/off control of a pump or compressor, pressure limit override on a control valve, or a pressure activated isolation valve.