

Part 9: Confined Spaces

New section 9.18.1, Exemptions

Purpose:

The current requirements for isolation and de-pressurizing of harmful substances in a confined space need to be reviewed. This review is focused on water-containing piping passing through valve, metering, and pressure reducing and similar below ground chambers – confined spaces that are part of the public water system. As well, the review involves water passageways within hydroelectric power-generating dams. Currently when workers service equipment in a public water supply chamber, water flow through piping within the vault is maintained with piping kept under pressure and isolated by means of one or more valves not part of a double block and bleed system.

Similarly, when workers enter water passageways within the dam to perform inspections and maintenance, a single valve is used to isolate the body of water behind the dam from the passageways. Section 9.18 does not allow for valve isolation with pressure being maintained on the upstream side of a valve. Hence, both public water supply systems and hydroelectric dams are currently in non-compliance.

Rationale for Change:

Failure to maintain a positive pressure in a domestic water supply pipe can cause a risk of contamination, due to the potential for ground water intrusion, and the disabling of fire control and suppression systems.

Nearly all dams throughout the world are designed based on achieving isolation based on a single valve. To be in compliance with section 9.18, water in a lake behind a dam would be required to be emptied to below the level of the intake penstock. This is clearly impractical.

Key Issues:

- Municipal and city representatives have requested that WorkSafeBC consider an exemption under section 9.18, Isolation, for the water supply systems.
- Water-containing piping systems are maintained under pressure at all times within underground chambers and stations.
- Workers routinely enter and work within these confined space structures while piping is under pressure resulting in non-compliance with the current requirements of section 9.18.
- A single large valve is used to isolate the body of water behind the dam from the passageways, areas in which worker routinely enter to carry out scheduled work.
- Essentially most hydroelectric dam operations are currently not in compliance with the isolation requirements of section 9.18.

Evaluative Mechanism:

The proposed amendments will reduce the number of requests for variances and enable the industry and WorkSafeBC to devote more time to other health and safety areas requiring attention.

Source:

Cities and municipalities

Please note that proposed deletions in the regulatory amendments are identified with a ~~strikethrough~~ and additions are identified in **bold**.

PART 9: CONFINED SPACES

LOCKOUT AND ISOLATION

Isolation	9.18 (amendment approved July 25, 2006 and effective January 1, 2007) (1) Except as provided in subsection (2), before a worker enters a confined space, adjacent piping which contains or has contained a harmful substance must be controlled by (a) disconnecting, blanking or blinding, or equivalent engineered system, or (b) if the adjacent piping contains a harmful substance that is not a gas or a vapour, nor a liquid of sufficient volatility to produce a hazardous concentration of an air contaminant in the discharge of the piping, a double block and bleed system. (amendment approved July 25, 2006 and effective January 1, 2007) (2) If adjacent piping contains or has contained a substance that is hazardous only because of its pressure, temperature or quantity, before a worker enters the space, the pressure must be controlled (a) to meet the requirements of subsection (1), or (b) provided there is no other pressure source or head pressure, by de-energizing and locking out the pressure source and depressurizing the line, or (c) by other effective means. (3) Repealed. (4) Except when used in an acceptable double block and bleed system, the closing of one or more valves in a line is not an acceptable means of isolation. (5) Isolation of a confined space from gases found in a gravity-flow municipal or domestic sanitary or storm sewer system may be accomplished by a p-trap, provided that (a) the integrity of the trap is ensured immediately upon entry, and (b) the atmosphere is continuously monitored and shown to contain clean respirable air.
Exemptions	9.18.1 (1) In this section: “public water supply system” includes valve and meter chambers and pressure reducing stations; “hydroelectric dam water passageway” includes penstocks, power generating chambers, valves and related structures.

- (2) Section 9.18 (4) does not apply to water piping that is part of a public water supply system if the piping and associated equipment is designed, constructed, maintained and certified by a professional engineer to American Water Works Association standards.**
 - (3) Section 9.18 (4) does not apply to a hydroelectric dam water passageway if the structures of the passageway are designed, constructed, maintained and certified by a professional engineer.**
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Explanatory Note

BC municipalities and cities may not currently be in compliance with specific requirements of the confined space regulations concerning isolation of water within piping contained in valve and metering stations and pressure reducing stations – confined spaces that are part of the public water system. When workers service equipment in water and meter chambers or pressure reducing stations, piping is isolated by closing one or more valves leaving the pipe under pressure on the upstream side of the valves. As well, there is commonly a bypass line to the main line within the chamber or vault such that there is a continuous flow of water through the structure. This is standard practice as continuity of flow is required to prevent ground water intrusion and to maintain pressure for fire protection.

“Public water supply system” is defined in proposed new section 9.18.1 (1) to include valve and meter stations, pressure reducing stations and similar structures.

Proposed new section 9.18.1 (2) allows single valve isolation of water-containing piping and associated equipment if the piping and associated equipment such as gate valves are designed, constructed and certified by a professional engineer according to American Water Works Association standards.

Common to most hydroelectric dams is the practice of isolating water held back by the dam from the water passageways within the dam by means of a single valve. Hence, hydroelectric dams are currently in non-compliance with existing section 9.18 (4) since the closing of one or more valves is not an acceptable means of isolation. Workers routinely enter the water passageways to carry out inspections and maintenance of equipment therein such as turbines.

Proposed new section 9.18.1 (1) provides a definition for water passageways within a hydroelectric dam including penstocks, power generating chambers, valves (e.g., turbine inlet valve, Krippen valve), and related structures such as the turbine, including the Pelton Wheel turbine.

Proposed new section 9.18.1 (3) permits single valve isolation for hydroelectric dams if the structures of the passageway are designed, constructed, maintained and certified by a professional engineer.