



Health

Health Protection Unit

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TECHNICAL SAFETY BULLETIN: Entrapment Prevention at Public and Semi-Public Water Recreational Facilities throughout Manitoba

This Technical Safety Bulletin applies to all water recreational facilities that have a recirculation system, except for whirlpools.

The *Swimming Pools and Other Water Recreational Facilities Regulation (MR 132/97)* regulates public and semi-public swimming pools, whirlpools and other water recreational facilities in Manitoba. This *Regulation* can be found on our department's website at

<https://web2.gov.mb.ca/laws/regulations/pdf-reg.php?reg=132/97>. It is recommended that operators of these facilities keep a copy of the *Regulation* available on site for reference.

The *Regulation* prescribes evidenced-based requirements for design, construction, operation, maintenance and management of pools and other water recreational facilities to reduce the risk of injuries, outbreaks, and drownings, including those related to bather entrapment. Where the *Regulation* is necessarily non-specific, Manitoba has adopted third party industry standards that outline the specific operating parameters required for various swimming pool components to minimize the risks outlined above. Third party standards are developed and maintained by organizations such as ANSI, ASTM, ASME, NSF, ICC, and APSP. These standards are regularly updated and are normally available through the organizations that develop and maintain them.

Swimming pools and other water recreational facilities recirculate water for water treatment and the operation of water play features. During operation, all submerged suction fittings can pose a serious risk of entrapment if they do not meet industry standards, and are not properly installed and maintained. Entrapment occurs when a person's body, fingers, toes, jewelry, clothing or hair becomes entrapped or entangled under the water, preventing a bather from returning to the surface. Often, the strength of an adult is still not enough to remove someone that has become entrapped by a submerged suction fitting. There are five forms of entrapment associated with submerged suction fittings:

- **Hair entrapment**

Hair can become entangled or wrapped around a submerged suction fitting.

- **Limb entrapment**

Arms or legs can become lodged in broken submerged suction fittings with missing covers.

- **Body entrapment**
Any part of the body that covers a submerged suction fitting can be held down by suction.
- **Evisceration**
Sitting directly on a submerged suction fitting can cause internal injuries or disembowelment.
- **Mechanical entrapment**
Fingers, toes, and items such as jewelry or a bathing suit strap can become caught and entrap the bather.

To prevent these entrapment risks, *Section 8* of the *Regulation* sets minimum standards that pool operators must follow.

Sanitation and hazards

8(3) The operator of a swimming pool or other water recreational facility shall ensure that the drains and water recirculation facilities are designed, constructed and operated in such a manner to prevent entrapment of a bather due to suction or any other means.

8(4) The operator of a swimming pool or other water recreational facility constructed or altered after July 1, 2005, other than a whirlpool, shall ensure that the pool or facility is equipped with not less than two interconnected drain outlets separated by a horizontal distance of 1 m or more.

If a pool was built or altered before 2005, it is exempt from the requirement to have two interconnected drain outlets, but the facility must still comply with *Section 8(3)* and be designed, constructed and operated to prevent all types of bather entrapment.

This requires existing pools with submerged suction fittings that do not meet the requirements of ANSI/APSP/ICC 16 and ANSI/APSP/ICC 7 to be retrofitted so that all submerged suction fittings are replaced with those that meet the most recent edition of the above requirements.

Existing pools with a single drain have four options to address the suction and entrapment prevention requirements in *Section 8(3)*:

1. Install a Second Interconnected Main Drain

Renovate the existing pool basin to install a second interconnected main drain in accordance with the most recent edition of both ANSI/APSP/ICC 7 and ANSI/APSP/ICC 16, such that the basin is equipped with not less than two interconnected drain outlets separated by a horizontal distance of 1 metre or more. Factors that must be considered are the ease of renovation and accessibility of the piping in the main drain system. This solution requires the least amount of ongoing maintenance as the suction hazard is removed through proper sizing and spacing of the main drains.

2. Install a Safety Vacuum Release System

Retrofit the existing pipes serving the main drain to install a safety vacuum release system (SVRS) that has been tested by a third party in accordance with ANSI/ASME A112.19.17 or ASTM F2387. An

SVRS is a mechanical device installed on the suction side of the pump serving the recirculation system. The device monitors the suction in the line and must be properly designed and engineered for the pool's recirculation system. If a bather blocks a submerged suction fitting, such as a main drain, the force of suction can entrap a bather and hold the bather against the suction fitting. A safety vacuum release system will detect the blockage and the device will either relieve the suction through a vent or shut down the pump motor, depending on the type of the SVRS. Safety vacuum release systems require regular testing, maintenance and documentation to ensure they are functioning in proper working order. **Note:** Manual emergency stop switches that allow patrons or staff to shut down the pump in the event of a suction entrapment will not be approved for use as a safety vacuum release system.



Above: Safety Vacuum Release System.

3. Permanently Cap and Disable the Existing Main Drain

Research shows that main drains can be permanently capped and disabled with no negative effects to the pool's water quality or filtration. This will divert 100% of the water flow through the pool's existing skimmer system and is typically a cost-effective permanent option.

4. Other Options

Any other option designed by a professional engineer meeting industry standard and approved by the local public health inspector that adequately removes the entrapment hazard, in accordance with the most recent edition of both ANSI/APSP/ICC 7 and ANSI/APSP/ICC 16.

In addition, it is critical that operators and their service professionals ensure that suction fittings are properly secured, regularly checked, and maintained. ANSI/APSP/ICC 16 requires that manufacturers provide the suction fitting cover service "Life in Years", **after which it must be replaced**. This information is permanently marked on all manufactured and third party certified covers, which must be in place on all submerged suction fittings. Covers must be changed and fittings including fasteners must be in good condition in order to manage and prevent entrapment risks.

Any modifications made to the pool basin and/or recirculation system of the pool shall be designed by a professional engineer in accordance with *Section 4* of the *Regulation*. The operator, engineer and pool contractor are responsible for ensuring plans and specifications for equipment are registered pursuant to *Section 3* of the *Regulation* and submitted to the public health inspector. Approvals must be obtained from Manitoba Health PRIOR to making any changes to the water recreational facility.

The entrapment prevention requirements are in place to reduce and eliminate any potential for death or injury from occurring in pool facilities.

For more information, please contact us by email at healthprotection@gov.mb.ca or by phone at (204) 945-4204.

References:

Suction Entrapment Avoidance Provisions Pool & Hot Tub Council of Canada [Suction-Entrapment-Avoidance-Provisions-G-0109.pdf \(poolcouncil.ca\)](#) April 2009

Drain Cover Safety & Entrapment Protection Pool & Hot Tub Alliance [Entrapment Protection - Pool & Hot Tub Alliance \(phta.org\)](#)

Information to Complete Anti-Entrapment Compliance Plan for Public Swimming Pools Alberta Health 2018 [wf-eph-info-complete-anti-entrainment-compliance-form.pdf \(albertahealthservices.ca\)](#)