

Dave Hamer, supervisor at Saanich Commonwealth Place, demonstrates their chlorine gas closure system.



# Remote shut-off devices prevent chlorine gas emergencies

By Marnie Douglas

Exposure to high levels of chlorine gas can result in serious injuries and even death, but exposure is preventable. The team at Saanich Commonwealth Place is going to great lengths to ensure it's prepared in the event of an emergency leak.

When supervisor Dave Hamer found out that WorkSafeBC would be completing a routine risk assessment inspection at the Saanich Commonwealth Place aquatic facility, he wasn't concerned. He understood the pool to be fully compliant, with all employee training up to date.

"So I was quite surprised, when after the inspection, we received an order," explains Hamer, technical and building operations supervisor with the District of Saanich.

Saanich Commonwealth Place was built for the 1994 Victoria Commonwealth Games and has been operating as a legacy facility to support high-performance sport and community recreation programs and services ever since. Among other events, the facility is a frequent host of national swim meets and even hosted the 2006 Pan Pacific Championships.

The pool itself holds some 1.3 million gallons of water and uses compressed liquefied chlorine gas, stored in cylinders, as a disinfectant. There are four in total, each with 150 pounds of liquid gas.

## Chlorine leak could be deadly

Chlorine gas leaks at municipal and private pools are the most common source of chlorine gas exposure for workers in British Columbia. At greatest risk are those who use the liquefied chlorine gas. Workers who are exposed to high levels of chlorine gas are at risk of immediate injuries including damage to the eyes, irreversible lung damage, and death.

In the event of an emergency, or accidental release of chlorine, employers must ensure that the gas supply can be shut down from a remote location to stop the generation or flow of the gas.

"We needed to install valves on the chlorine gas cylinders that could be shut off remotely in the event of a leak. So I started doing research and found there are not a lot of mechanisms on the market that shut off cylinders remotely," Hamer says.

After exploring what was available — he researched pools and water-treatment plants around the world — he was able to source a remote-controlled device and

shut-off valves that receive a signal from a gas detector near the tanks and shut off the flow of gas at the cylinder head when a minimum of 3 parts per million of gas is detected.

The valve shutoff is mounted on each cylinder and closes the valve when it gets a signal from the remote controller. The controller can receive closure signals from the gas detector, from a seismic sensor in the event of an earthquake, from the fire alarm, and from an emergency panic button.

A key feature is that while the valve closes automatically, staff must re-open the valve manually, thus requiring an on-site assessment of the situation that caused the valve to initially close. Hamer recommends that others do their homework too. He found that in some facilities these valves were not installed right at the tank. When activated, they wouldn't stop gas from continuing to escape from the tanks.

## New apparatus made sense

Rita Coshan, manager, occupational health and safety with the District, said staff looked into whether it was worth changing out the cylinders completely and moving to a different method of disinfection, such as liquid chlorine or salt water. But the cost to replace the system was prohibitive. The new shut-off valves were a safe option that made fiscal sense.

"The facility is a large one and it's busy. There is staff working 24/7, so we needed something robust," she says. "Previously, if we were to have a leak, we could not stop the flow remotely. This meant delays in stopping the flow and staff having to enter the chlorine room to manually stop the flow. There was a chance of a facility evacuation and possibly the evacuations of the surrounding neighbourhood. A major chlorine gas release could trigger a mass evacuation."

## Prepared for an emergency

In addition to installing the remote shut-down device, Saanich also worked with Don MacFadgen, supervisor Prevention Field Services and with WorkSafeBC's Risk Analysis Unit to improve their emergency-preparedness planning around a chlorine gas leak.

"There were some gaps there," says MacFadgen of their previous program. "They've since completed tabletop exercises and practiced evacuation procedures."

Now, both Coshan and Hamer are confident that their workers and patrons are protected from the risk of a tragedy due to a leak.

"Dave did a great job doing his research. His due diligence and the supportive response of the District's senior management team who approved the purchase and installation of the valves, made the project the success that it is," says Coshan.

"It's a dangerous gas, but with this technology, it's safe. I know all my staff feel much safer with the valves in place. Since these were installed, we haven't had any issues," Hamer adds.

## Understanding and mitigating the risks

The [worksafebc.com](http://worksafebc.com) website has a number of resources on the risks and safe-work practices associated with chlorine gas. These include:

- A bulletin on [Preventing chlorine gas exposures at municipal pools](#)
- A risk advisory on [Chlorine Exposure During Storage or Use](#)
- The [Chlorine Safe Work Practices](#) manual
- The [PoolSafeBC: Best Practices Guide](#) 📖

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