

City of Dawson Creek

Freon system upgrade eliminates ammonia safety risks; reduces operational and energy costs; results in \$24,000 energy rebate • Dawson Creek, BC

Owned by the City of Dawson Creek, the NHL-size Memorial and Kinsman hockey arenas offer winter season sports, as well as year-round special events for area residents and the surrounding communities. The City's 8-sheet Dawson Creek Curling Rink, located in a separate building and operated by the Dawson Creek Curling Club, completes the areas ice entertainment facilities, offering banquet accommodations and facility rentals, in addition to its regular curling events.

Challenge

When the City of Dawson Creek staff discovered ammonia contamination in the brine mixture needed for the ice cooling system shared by its Memorial Arena and Curling Club, the City took fast action for the safety of its patrons. The facilities were closed as the City worked with TFM Consultants International and the BC Safety Authority to quickly restore services.

Solution

To avoid safety hazards associated with running ammonia and maintain compliance with the BC Safety Authority, the Dawson Creek City Council approved replacement of its ammonia cooling system with a Freon-based system. A design/build request for proposal (RFP) was issued for the upgrade of systems at the City's two ice arenas and its curling rink. At a Special Meeting, the Council selected Trane as the general contractor for the upgrade project based on the company's creative design solution and expertise in HVAC equipment.

Improving reliability and efficiency

To increase capacity, reliability and redundancy, Trane proposed installing a larger cooling plant with three Trane water-cooled Series R™ Helical Rotary Chillers (model RTWD), each with dual, variable capacity, direct-drive compressors on independent refrigeration circuits. The chillers provide precise temperature control and can be configured to produce brine evaporator temperatures as low as 10°F (-12°C), making them ideal for the quick-freezing ice rink operations.



Upgrading the aging ammonia system at the Dawson Creek arenas and curling rink with a Freon system is expected to add twenty-five years to the life of the facilities.

Reducing operational costs

With their compact size, the Trane chillers fit easily into the building's existing mechanical room. Unlike ammonia systems, the lower toxicity and flammability classification of Freon-based Trane chillers do not require special mechanical room features. They are also designed to connect to water, electrical and control lines with minimal infrastructure changes, enabling a faster, less costly installation. The ammonia system previously used at the facilities required a specially trained and certified technician to service and maintain the equipment. Service and maintenance can now be completed by any professional HVAC technician, eliminating the need to pay a premium for the often hard-to-staff certified operator.

Implementing energy saving strategies

Building operators monitor and control their systems with a user-friendly Trane® Tracer™ SC building automation system (BAS). Accessible from a PC, tablet or smartphone, the Tracer SC allows remote system access to handle daily tasks, make set point changes to increase comfort and implement strategies to reduce energy use. The BAS alarm notifications serve as an early warning system to enable quick action if an issue arises.

The system was designed with sophisticated energy saving strategies, including chiller sequencing, variable speed pumping on both evaporator and condenser circuits, and time-of-day scheduling. In addition, with Active Monitoring, Trane technicians, on duty 24/7, monitor systems, analyze alarms, and address issues remotely or forward to a Trane service office for resolution.

Results

As a single-source supplier for equipment, controls and installation, Trane worked with Dawson Creek to replace failing and aging systems at the City's Memorial and Kinsman Arenas, and the Dawson Creek Curling Rink. Upgrading the equipment with a Freon cooling system eliminated safety risks associated with using an ammonia system. The system, which includes three Trane water-cooled Series R™ Helical Rotary Chillers, is expected to add more than twenty-five years to the life of the arenas and is projected to provide \$18,000 in annual energy cost savings. Based on Trane modeling data, a \$25,000 rebate was awarded to Dawson Creek from BC Hydro utility company. Upgrading to a Freon system that can be supported by professional HVAC technicians, rather than specially certified personnel, will also help reduce operational costs.



Series R™ Helical Rotary Chillers produce brine evaporator temperatures as low as 10°F (-12°C) for the quick-freezing ice rink operation.

“With the Freon system, there was a bit of a learning curve for everyone, and Trane worked hard to mitigate any issues,” said Duncan Redfearn, Director of Community Services, City of Dawson Creek. “The chillers are exceptional and we’re happy with the energy savings potential. We went from an archaic system to a safer, enhanced system. We are well ahead of where we were.”

“I would like to thank TFM Consultants International and Trane for their efforts with the City of Dawson Creek's ice plant replacement project,” said Mayor Dale Bumstead, City of Dawson Creek. “The professionalism demonstrated by Trane was impressive. They kept the City up-to-date on job progress, and displayed diligence and discipline, which resulted in the ice season starting two weeks before anticipated. The City of Dawson Creek is extremely satisfied and looks forward to many more years of ice activities for all its residents!”



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