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Running Your Rink and Keeping Your Cool

By David Blurton

If you don't have ice, you don't have an ice arena.

Sounds simple enough, but making sure you consistently have good ice throughout the year is a challenge ice arena managers face every day. There's nothing worse than getting a call that the ice-making equipment has broken down and your sheet of ice is turning to slush. Consistently good ice is every arena manager's dream. But all too often, equipment breakdowns and malfunctions turn those dreams into nightmares.

Background

These were the worries of Chuck Wilson, Arena Manager of the Sun Prairie (Wisconsin) Ice Arena. The arena is owned and operated by the Sun Prairie Youth Hockey Club. Over the years, facility managers had done an exceptional job keeping its equipment running. This was no small task given the age and complexity of the equipment. When the arena first opened in 1978, it received a considerable amount of used and donated equipment.

"The equipment room had become a hodge-podge with outdated relays and switches," notes Chuck, who took over the role as arena manager about 10 years ago.

"To add to the challenge, our control system components ranged in age from 25 to 50 years old and we were no longer able to find replacement parts." Chuck worried that a major breakdown would cost the arena dearly in paid ice time.

"Reliability was our biggest concern." Enter Bassett Mechanical. When Royal Johnson, General Manager of their Madison office, first met with Chuck, they discussed the outdated controls and surveyed all the mechanical equipment,

including the compressors. Royal noted a number of areas where the arena could realize greater energy efficiency out of their equipment.

The Solution

Led by Royal, a team of experienced refrigeration and controls personnel put together a proposal that would improve the reliability of the equipment, extend the life of the equipment, provide better quality ice, and deliver energy savings. To achieve these results they would repair and refurbish the compressors, install new digital controls, replace a dehumidifier and establish a regular maintenance program.

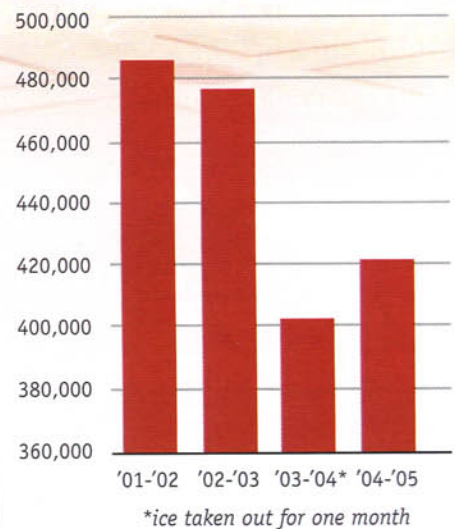
The proposal went so far as to guarantee the arena could reduce its energy usage by at least 10%. The proposal was readily accepted and approved by the arena board. To measure the results of the efforts, the local power company installed a special meter to monitor the energy usage for 30 days before the project began. The same metering was done after the work was completed. The results were better than the promised 10% energy reduction. Sun Prairie Ice Arena took four distinct steps to bring their ice-making system up to the level they desired.

1. Repaired compressors – The two Vilter reciprocating compressors that were running fully-loaded had a number of worn parts that needed to be replaced. After the repair work, one compressor was able to handle the entire system which considerably reduced energy costs. In addition, the arena applied for and received a \$6,000 Focus on Energy grant, which helped to offset the cost of the repair work.

2. Installed digital controls – Bassett



Energy Use annual kWhs



custom-designed new digital controls to fit the variety of equipment. The new system has a user-friendly interface and includes an alarm system. The controls include:

- Intelligent compressor and condenser sequencers to operate the equipment at optimal levels for the current ice requirements.
- Automatic summer and winter operating mode for the evaporative condenser.
- User-friendly interface allowing the operator to monitor temperatures and pressures and adjust set points as required. The interface also displays equipment and system operating status.
- Fault annunciation system informs the operator of active faults and generates

a history of all system faults.

- New control wiring diagrams and field component wiring.
- System training and documentation manuals.

3. Replaced a dehumidifier – The new dehumidifier controlled the level of humidity in the arena, making it less likely for a layer of ice crystals to form on the surface of the ice. This also helped make the cooling process more efficient.

4. Scheduled regular maintenance – Ice arena management worked with Bassett to develop a maintenance agreement, which gives peace of mind by delivering the following benefits:

- Assures the ice-making system is receiving quality service, resulting in year-round reliability.
- Provides owning and operating cost control.
- Lowers energy usage.
- Extends equipment life.
- Offers budgetary control with one



fixed monthly cost versus fluctuating expenses and sporadic surprises.

The Results

Before the improvements, Chuck Wilson was concerned about the reliability of the ice-making equipment. When the project was complete, he not only had reliable equipment, but also reduced energy costs and increased ice quality. Annual energy usage was reduced dramatically as a result of the project. The graph on page 38 shows how KwHs dropped in the two

years following the project, compared to the two years prior. On average, 14% less energy has been used in the two years following the project. Wilson is very pleased with the results. "I sleep better at night because I have faith in the system," says Chuck. "If a problem does arise, Bassett will take care of it quickly and at no additional cost. And by preventing problems, we have ice time we can count on."

A Model for Others

If you are the manager of an ice arena, your facility may be able to dramatically improve the reliability of your ice-making system and realize some of the same energy savings and ice quality improvements. Many ice arenas have old and outdated equipment, to stay within constrained budgets. At times facility managers have limited experience with refrigeration equipment and are unfamiliar with the advantages of newer digital controls and ways to be more energy-efficient. ★