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MAY.JUNE.2013

Keys to Energy Efficiency

I received a call recently from an individual named Steve that had taken his first job in an ice rink as the manager. He had been in a management role at another facility for the local park and recreation department and was given the additional responsibility of overseeing the management of the ice rink.

Steve told me that he had read the recent articles in *RINK Magazine* about LED lighting and fuel cell technology and wanted to know what else could be done to improve the energy efficiency of his rink without a major capital investment.

I told Steve that many things could be done at his rink to control energy consumption with little-to-no cash outlay. My first suggestion for him was to inspect all of the mechanical systems (HVAC, dehumidification, refrigeration, domestic hot water) in his facility to determine where the pieces of equipment in these systems were in their life cycle. Does the equipment need minor preventive maintenance? Repair? Replacement?

Maintaining a consistent thickness through daily ice maintenance would go a long way in helping him to control the refrigeration system energy consumption.

Next, I suggested that he spend some time researching who designed and installed the mechanical systems at his facility and find out how they were originally specified to be operated. Then he would need to determine whether the staff was currently operating these systems as designed.

I suggested he walk around the facility to inspect the building envelope. Do all the exterior doors close tightly and are the seals in good condition? Are there drafts around exterior windows? Are there any apparent problems with the vapor barrier and insulation in the exterior walls and roof? Is his staff consistently propping exterior doors open during the day? I explained that all of the mechanical systems were designed to handle normal conditions inside his facility, not the additional load introduced by outside conditions due to a porous envelope.

Finally, I asked how thick his ice sheet was? He said he didn't know, and then asked me why. I explained that the refrigeration system was most likely the largest consumer of energy in his facility, and simply put, the thicker the ice sheet is, the more energy the refrigeration system will consume to keep it frozen. Maintaining a consistent thickness through daily ice maintenance would go a long way in helping him to control the refrigeration system energy consumption.

As elementary as much of the information above may seem, it is all too common for ice rink mechanical systems to be operated improperly over time as the facility's staff turns over. Ongoing preventive maintenance and employee training are the first steps in optimizing the energy efficiency at your facility.

I wish you and yours lower utility bills this spring and summer.

Jeff Theiler, *Chief Operating Officer, Serving The American Rinks*

THE OFFICIAL PUBLICATION OF STAR
MAY/JUNE 2013 // VOL. 16, NO. 3

RINK MAGAZINE

RINKMAGAZINE.COM // INFO@RINKMAGAZINE.COM

RINK Magazine is the definitive business publication for professionals in the ice rink industry and is the leading source for information on facility management, operations and programming.

EDITOR
Greg Anzalc

ASSOCIATE EDITOR
Aaron Pallich

CONTRIBUTING WRITERS
Justin Felisko, Cameron Eickmeyer, Patricia Prepp, Allan Long, John Montaleone, Craig Petersen, Cory Portner, Gary Rimler, Erin Schopf, Jeff Theiler

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Mike Bauer, T.C. Lewis, Craig Petersen, Ben Ruggles, Dave Wescott

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SERVING THE AMERICAN RINKS

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DIRECTOR, CRA PROGRAMS
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PH: (719) 538-1149 FAX: (719) 538-1160
E-MAIL: info@starrinks.com
WEBSITE: starrinks.com | narcs.com

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STAR is a program of USA Hockey and U.S. Figure Skating

Touchpoint MEDIA | PUBLISHING PARTNER

505 North Highway 169, Suite 465, Minneapolis, MN 55441
PH: (763) 595-0808 FAX: (763) 595-0016
E-MAIL: info@touchpointmedia.com
WEBSITE: touchpointmedia.com

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Steve Barbeau

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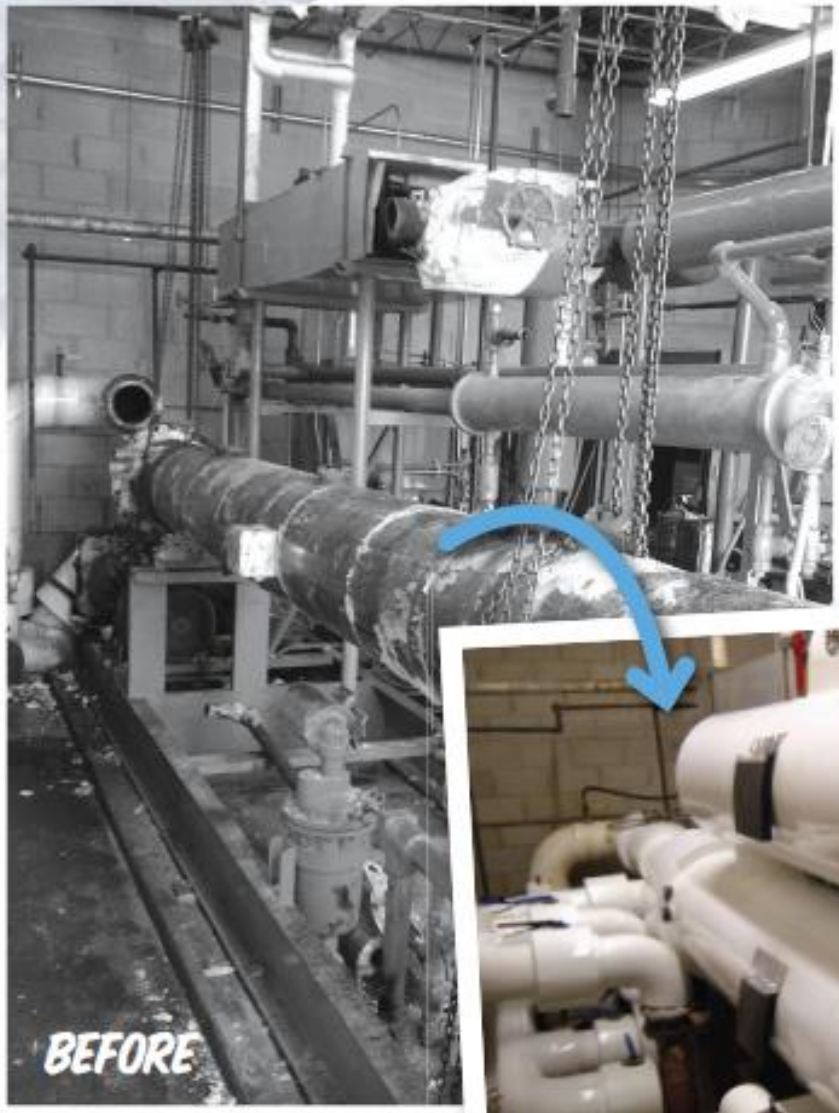
Feeling a CHILL

A guide to replacing your facility's chiller

Stories and photos by CRAIG PETERSEN



The Kettle Moraine Ice Center in West Bend, Wisc. recently replaced their chiller barrel in the refrigeration plant. The original shell and tube chiller had been in service for 20 years and was suspected of leaking. To confirm the suspicion, a tube analysis was completed. The analysis verified that 75% of the tubes showed a pit of 50% or greater.

Faced with the fact that the chiller needed to be replaced, the facility decided to undertake the project over the summer to minimize the impact on the rink's programming. Below is a picture series showing the process from start to finish.

Feeling a CHILL

3 → With the insulation off and the connections to the refrigeration system removed, it is time to take out the old chiller from the ice plant. The chiller is supported by chains in preparation for transport.

4 → The existing 20-year-old chiller barrel and surge drum are placed on a trailer to be transported to their final resting place.

1 → The first step in removing the old chiller is to reclaim the primary refrigerant and drain the secondary refrigerant.

2 → Then remove insulation from the chiller and disconnect the pipe connections. This project was completed by volunteer labor over a weekend.

Feeling a CHILL

5 → Bringing in the new chiller requires a boom fork with a heavy duty pencil extension. Fortunately for this crew, the ice plant has an overhead door, making the installation easier than most.

6 → With the new chiller in place, it is time to begin work on the fittings to connect it to the existing system.

7 → There is a lot of fitting work necessary to get the system up and running.

8 → With all connections complete, the system is pressure-tested, then charged with new refrigerant.

9 → The final touch on the new chiller installation is insulating the package, and refilling with secondary refrigerant.

→ Overall, the entire project from start to finish was three weeks long. Using volunteer labor and contractors, the facility was able to keep the expenses to $60,000 for the entire installation, which included a new high-side float, brine pump and motor.