



# OLYMPIC ICE CENTER



## EXISTING CONDITION

This facility operates year round to make ice but also maintains humidity levels and temperatures which required heat year round.

The challenge was to capture the heat off the ammonia system and head cooling loop to save energy and water.

The ammonia system was a staged 700 ton system with a cooling tower. The heads for the compressors were cooled with a once through city water system meaning water was rejected to the sewer once it cooled the compressors.

## CLOSED HEAD COOLING LOOP DIVERTED INTO AIR HANDLER

By creating a closed head loop we designed a system saving millions of gallons of water per year. The air handlers already had a chilled water loop that was designed for air conditioning that was engineered but never used since the facility never needed air conditioning. During the process the controls were integrated into the Rockwell Automation system that was already in place.

## AMMONIA SYSTEM HEAT RECOVERY TO HEAT THE FACILITY

The hot ammonia gas that was originally going to the cooling tower was diverted to a heat exchanger then to another air handler that had a chilled water loop. This was a three row coil in an air handler supplying an average of 28,000 CFM. The recovery was over 1,067,000 BTU per hour with a supply temp of 86F. The resulting reduction of load to the cooling tower also will reduce the energy and water use associated with condensing the ammonia by approximately 80% for a savings of electric power around 150,000 Kwh.

## VFDS ADDED TO COOLING TOWERS TO TAKE ADVANTAGE OF REDUCED LOAD

The cooling tower was a standard staged fan and water system that operated on pressure. There were no VSDs however that could fully take advantage of the reduced load going to the tower. Tower Energy then added 2 - 15 horsepower drives to the 2 main fans and is staging the fans to work in tandem while maintaining optimum compressor pressures. A 3rd fan is working as trim. The water loop will be on a VSDs to maintain head while controlling flow based on discharge pressure.

## WATER AND SEWER SAVINGS

GALLONS PER YEAR	SAVINGS
3,924,954 gallons	\$ 26,115

## THERMS PER MONTH SAVINGS

DATE	2014-15	2015-16	SAVINGS
11/30/15	22,000	16,485	\$ 3,529
12/30/15	26,000	12,995	\$ 8,323
1/30/16	27,000	16,160	\$ 6,937
2/29/16	23,000	11,792	\$ 5,641

### TOWER ENERGY CAN CHANGE YOUR ENERGY BILL

Using new and innovative technologies, Tower Energy can reduce your gas, electric and water bills. Looking for practical and less expensive alternatives using existing equipment is always a viable option. In addition, making employees aware of simple fixes will add operational efficiency at little or no cost.

### UTILITY SUBSIDY AND GRANT PROCUREMENT

Tower Energy secured a WE Energies grant of over \$84,000 to subsidize the project.

### FREE ENERGY ASSESSMENT AND TAX ANALYSIS

Tower Energy will conduct a free energy assessment to evaluate opportunities that may exist. We also analyze your utility bills for exemptions from The EPA Energy Act of 2006. This frequently results in a tax refund or exemption on energy used in your facility.