Note that these field results were gathered by York engineers on York equipment with York software

YORK AIR CONDITIONING CHILLER EQUIPMENT PILOT

IceCOLD™ REFRIGERANT COMPRESSOR OIL FOULING REMOVER

Return on Investment (ROI)

The ANNUAL ENERGY SAVINGS for 10 YEARS is shown in Attachment 1. The projected 10 year energy savings is $262,844 (US dollars).

Evaluation Objective

The objective is to study the base line performance data from a 120 ton York Chiller from May 6, 2002 to May 19, 2002. Then, install the IceCOLD™ Refrigerant Compressor Oil Fouling Remover on May 20, 2002. The same performance data would be monitored to June 2, 2002 in order to compare and evaluate the energy savings from the installation of IceCOLD.

Facility

The facility is a 25 story building in Mexico City in the Republic of Mexico.

AC Equipment

The equipment is a 120 ton York Chiller unit. The unit is the primary unit that works in series with 5 additional units.

Data Gathering Equipment

The performance data was gathered internally with the York instrumentation system installed in Torre Esmeralda and a portable unit was also used to collect the KWH and amperes data for the treated Chiller. The performance data included, KWH, amperes, run time, starts, chiller water temperatures, suction pressures and outside temperature. The data was collected every 15 minutes. The data collection was done by Ing. Roberto Sandoval, a York supervisor. See Attachment 3 for all data gathered by York for this analysis of energy savings using York Talk II software.

Installation

The installation was sponsored by York (Manufacturer) Air Conditioning Equipment Company and by observed by David Pickett, CEO of U.S. Refrigeration Technologies, LLC, Inc. of Dallas, Texas and its Mexican affiliate, Xicron Partners. The installation was conducted by CYVSA, the largest air conditioning maintenance company in Mexico, which provides 24/7 AC maintenance to the Esmeralda Tower.

Calculation Methodology

Calculation of efficiency increases (or decreases) in refrigeration systems consist of a relationship between the following parameters:

- Refrigeration systems cool a volume of air while consuming energy. Any factor that increases the workload on a compressor to cool air, or that hinders its efficiency is defined as load demand. Energy consumption will always increase under greater load demand. The energy consumed is measured and expressed as kilowatt-hours (kWh) of energy used.
- Higher outdoor temperatures affect a refrigeration system's ability to expel heat and are expressed as cooling degree-days (CDD). The temperature data collected are averaged and then compared with the nominal temperature of 65 degrees. Cooling-degree days are expressed as the number of degrees above the nominal temperature.

The amount of power consumed to extract heat from the building's air volume, per cooling degree-day (kWh/CDD) was calculated daily to compare the average power consumption before and after treatment to measure changes in energy efficiency.

Evaluation Results

***Pretreatment Period*:** Average baseline energy consumption was 787.020182 kWh/CDD. (May 6 to May 19)
Post Treatment Period: Average energy consumption was 563.00578 kWh/CDD. (May 20 to June 2)

Efficiency Improvement: The combined efficiency improvement of all systems was **28.0%**.

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