

Industrial Refrigeration and Sustainability

Sustainability, in terms of energy usage, is generally not in the lexicon in the world of industrial refrigeration. Sure, we are seeing VFD drives put on condenser fans and control systems that sequence compressor operation, but that's about it.

Recently, Austin Energy instituted a program that added a penalty to large users if the power factor was less than .85 (this rises to .90 after January 1st). One of the largest industrial refrigeration facilities in Austin is the Whole Foods Distribution Center. It has a 50,000 s.f. freezer(-10 dF) and 75,000 s.f. of cooler space (28 dF to 45 dF). There is an ammonia refrigeration system utilizing 4 screw compressors with a capacity of approximately 630 tons.

Due to changing market conditions, 60% of the freezer was converted to cooler space. This change reduced the low temperature load dramatically causing the low temp. compressors to run at 20% capacity. Screw compressors control capacity by modulating a slide valve which controls the volume of the intake vapor. The power consumption will decrease but not in a linear fashion.

Whole Foods corporate philosophy embraces green technology. This, coupled with the economics of the power factor penalty, prompted them to look at other options. The most obvious was to install VFD drives on the low temp compressors. An analysis shows that controlling capacity by the VFD drives lowers power usage on the compressors by 65%. It becomes a win-win situation. The corporation gets greener and the energy savings add to the bottom line.

Submitted by Steve Roche / Refrigeration Chair
RCE, Inc.
281-292-6842