

Variable Primary Pumping

All Variable Speed

3x 550Ton SMARTD Chillers

3x 50Hp VFD Chw Pumps

3x 40Hp VFD Cw Pumps

3x 25Hp VFD Towers

\$320,000 energy rebate

Total plant efficiency:

**0.28 to 0.72kW/Ton**

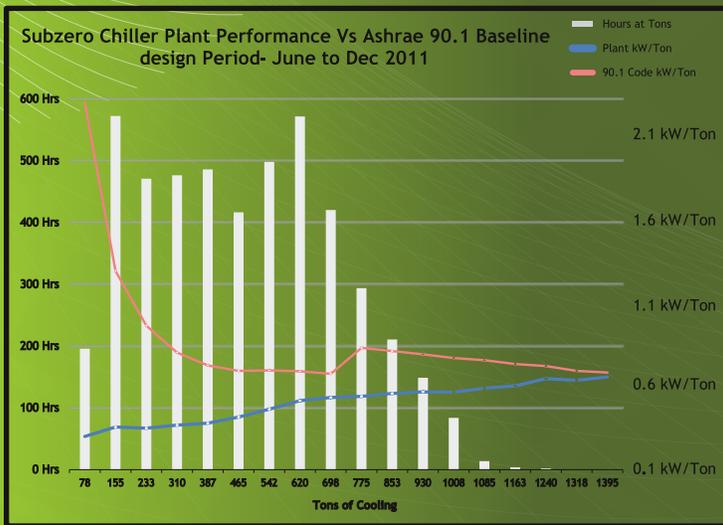
450,000 sq.ft Manufacturing Facility

Goodyear, AZ

1650Ton Chiller Plant

In late 2010 Sub-Zero Refrigerator commissioned the design for the fit-up of its new high-end refrigerator manufacturing facility in AZ. Part of the project scope called for construction of an ultra efficient, high reliability central air conditioning system to cool the 24/7 facility.

After exploration of several system configurations and equipment types it was apparent that large single zone CHW VAV air handling units in conjunction with SMARTD's high efficiency oil-free Magnetic bearing centrifugal chillers operating in an all variable speed plant fully optimized with Kiltech's CPECS platform would deliver the fastest the lowest life-cycle and the reliability demanded by the manufacturing facility. The CPECS optimization software capability was extended to reach outside the central plant and into each of the 52 roof mounted AHU's in order to find the optimum balance between chilled water flow, AHU fan power and chilled water set point. Thanks to the innovative design team Sub-Zero also met all criteria for a \$320,000 rebate rapidly increasing the energy payback schedule. Energy modeling, savings estimate and rebate management provided by Kiltech & Quest Energy.



- Achieved accumulated total plant performance of 0.52kW/Ton
- Met proposed performance levels within 1% of estimation
- Savings over Ashrae 90.1 2007 code compliant plant of 32%
- Annual savings of 1,250,000 kWh (1,572,500 lbs/ CO2 saved)



# Rapid delivery, high success and ultra efficiency

"CPECS energy dashboard provides intuitive view on real-time performance and comparison against baseline, system condition monitoring adds an additional level of comfort"

The project went forward with an aggressive schedule of four months from design to construction. Pearson Engineering's team rose to the challenge delivering an advanced energy efficient air conditioning system design in an tight time frame.



The pressure to provide rapid delivery was on all players including SMARTD and Kiltech, thanks to a cooperative communication channel between sales representative (Thermal Systems AZ), factory and general contractor all delivery expectations were exceeded. Now it was up to Bel-Aire Mechanical's high tech "Job Site Solutions" group to implement the system in an accelerated manner. Not to the surprise of anyone who had worked with Bel-Aire before, the plant was ready for startup on time and began providing cooling to the facility in May 2010.

With all equipment installed and operating the experienced Kiltech & Thermal Systems central plant controls team started the optimization system integration process. Integration was completed in under a week and the optimization routines took over plant control immediately reducing energy consumption by 53%.

Air side integration was completed in July 2010 which further reduced central plant usage by 9%.



**SMARTD**