



UTAC Singapore

A Sophisticated & Holistic Revamp of the Chiller Plant System

UTAC is headquartered in Singapore with production facilities also located in Thailand, China, Indonesia and Malaysia. The UTAC Singapore Plant is a key facility for semiconductor assembly and test services. The facility had utilized a Carrier chiller plant configuration, which consisted of 2 X 1000RT and 4 X 500RT water cooled chiller equipped with associated pumps and a dedicated cooling tower.

Background

The system worked as designed but over time, it was found that the system was contributing up to 22% of UTAC's energy consumption. Several findings were made, including run down conditions of the cooling tower and constant-speed Variable Speed Drives (VSDs) with no automation. As the existing cooling towers were designed in 2 phases (1996 & 2000) with different heat rejection capacities, there was no common connection point to all the chillers and they were of different static heights. Chillers were also aging with lowered efficiency.

Technologies & Solutions

- 3 x 600RT AquaEdge™ 23XRV tri-rotor water-cooled variable speed screw chiller
- 1 X 800RT AquaEdge™ 19DV water-cooled variable speed centrifugal chiller with Greenspeed® Intelligence integrates ceramic bearings system, EquiDrive™ compressor, falling film evaporator with low GWP PUREtec™ R-1233zd(E) refrigerant and SmartView™ control
- Existing 1 X 500RT and 1 X 1000RT chillers were overhauled for standby
- Replacement of existing 6 cooling towers to be of common static head
- Replacement of associated pumps equipped with variable frequency drive and trigger demand load throttle with VSDs
- Redesigned condenser piping arrangement into common header to improve cooling tower heat rejection by higher operation flexibility/redundancy
- Plant System Manager with iVu® chiller plant controls and smart algorithms to improve chiller plant efficiency & gain optimal performance insights
- Smart Connected Service with permanent measurement & verification system for continuous monitoring and proactively tackle potential issues via preventive maintenance

Customer Feedback

"The Carrier Singapore AdvanTEC team has provided us with innovative and tailored solutions to best suit our requirements, enabling us to achieve an ideal and sustainable operating efficiency."

Lim Koon Guan, Director,
UTAC Singapore

Summary



Singapore

Annual Energy Savings: 3.8 mil kWh

Return of Investment (ROI): ~16%

Payback: ~6 Years

Savings for Chiller Plant: 23%

Average Efficiency: 0.59 kW/RT

Annual Savings: ~USD\$287K

*based on USD 0.08/kWh electrical tariff