



## 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



**Annual Energy Savings:** 3.8 mil kWh

**Savings for Chiller Plant:** 23%

**Return of Investment (ROI):** ~16%

**Average Efficiency:** 0.59 kW/RT

**Payback:** ~6 Years

**Annual Savings:** ~USD\$287K

\*based on USD 0.08/kWh electrical tariff