Customer Success Story

Hongkong Land Embraces Sustainability with Trane's New Climate Solution

Project Highlights

Customer Name	Hongkong Land (Property Management) Limited
Building Location	LANDMARK, Central, Hong Kong
Products Used	Trane® CenTraVac® Water-Cooled Centrifugal Chillers @HFO R514A

The Challenge

From designing environmentally responsible properties to supporting the communities, sustainability is at the heart of the business of Hongkong Land (Property Management) Limited ("**Hongkong Land**"). Among its key strategies are utilizing leading technologies and adopting best environmental practices to mitigate the impact on climate change across its properties.

LANDMARK, a commercial complex owned by Hongkong Land and located in the core business area of Central, consists of three top-tier office towers. Hongkong Land was in search of a sustainable solution to reduce its energy footprint in two of these office towers – Gloucester Tower and Edinburgh Tower, as the chiller plant systems there contributed to a huge proportion of power consumption, and the breakdown maintenance cost continued to increase as the systems aged.

To solve these issues, Hongkong Land needed to retrofit the existing chiller plant systems to improve energy performance.

Trane's Solution

With the phase-down of hydrofluorocarbon (HFC) refrigerants having been put on the agenda by global climate organizations, Trane Hong Kong is well prepared to help building managers take the next step in their sustainability journey.

By retrofitting the existing R134a water-cooled chiller plant with an energy efficient and eco-friendly **Trane® R514A CenTraVac® Water-Cooled Centrifugal Chiller**, Trane was able to help optimize the chiller plant operations, with mixed use of fixed- and variable-speed chillers. Moreover, thanks to the more robust chiller designs, the solution also helped reduce the breakdown maintenance costs.

The 2,200-ton Trane® Duplex™ CenTraVac® chiller @HFO R514A

Trane's solution helped optimize operating efficiency and dramatically lower energy costs. Through simplicity in design, Trane R514A CenTraVac chillers feature a direct-drive multi-stage compressor with a semi-hermetic motor design which ensures stable and reliable operation as well as industry-leading efficiency. R514A achieves the highest performance among all next-generation refrigerant options today, with zero Ozone Depleting Potential (ODP) and Global Warming Potential (GWP) of less than 2.

In case of higher cooling capacity demand, Duplex™ chillers with a series-counterflow design and dual independent refrigerant circuits leverage thermodynamic staging to achieve unmatched energy performance.

Project Implementation

The project implementation process requires a great deal of coordination. Trane's task is to direct and manage each step of the way to make the project successful in its vision.

- Site Survey and Chiller Selection

  One of the initial tasks was to determine the chiller selection and combination for the LANDMARK chiller plant. Trane worked with a mechanical, electrical, and plumbing (MEP) consultant to simulate and develop an energy model to pinpoint a scheme with the best energy performance. The project team also conducted several site surveys to identify the site constraints for arranging the chiller plant layout and potential difficulties during the chiller delivery. The chiller selection process struck a balance between chiller efficiency and dimensions to address both the requirements of coefficient of performance (COP) and site space constraints.

- Project Fulfilment and Chiller Delivery

  In addition to the major benefits brought by this project to Hongkong Land and its tenants, Trane has achieved its own technical innovation during the project implementation.

At this stage, the biggest challenge Trane faced was to safely deliver all chillers to the chiller plant. Thus, a self-propelled trailer was employed to move the chiller components. The trailer has 24 wheels with twin tires which provide extremely high traction force and flexibility of movement especially when turning. This innovation made the whole delivery process safer and more efficient than the traditional method.

The Trane team also dismantled the existing chillers and safely disposed of the R134a refrigerant and lubricating oil to avoid environmental and health hazards.

- Testing and Commissioning – the Crucial Stage

At last, the project team conducted comprehensive testing and commissioning including field performance tests on both full- and part-load operations of the chiller systems to ensure that the full capacity and expected benefits could be realized.

Key Outcomes

The project utilized energy efficient chillers with R514A, an eco-friendly hydrofluoroolefin (HFO) refrigerant, to achieve outstanding chiller plant performance, resulting in lower energy use and operating costs, enhanced occupant comfort, and reduced greenhouse gas (GHG) emissions.

The project retrofitted the existing chiller plant with four 1,200-ton Simplex and two 2,200-ton Trane Duplex CenTraVac chillers at Gloucester Tower and Edinburgh Tower respectively. The project will bring the following benefits to Hongkong Land and its tenants in the two high-end office buildings.

- Low-pressure HFO refrigerant R514A with zero ODP and GWP of less than 2 offers the highest theoretical chiller efficiency among all refrigerants on the market. Users do not need to worry about facing refrigerant shortages or having to pay a high price due to phasing down of HFCs as required by Kigali Amendment[1].
- The operating efficiency fully meets all COP specifications with the best full- and part-load efficiencies, achieving the lowest life-cycle costs and minimizing the overall GHG emissions.
- Duplex chillers with a series-counterflow design contribute to enhanced availability and energy efficiency.
- Strong after-sales service backup helps sustain superior system reliability.

“We are very pleased to have the opportunity to collaborate with Hongkong Land and other stakeholders in advancing the journey to sustainability,” said **Frankie Chan**, Managing Director of Trane Hong Kong, “The LANDMARK project has received high recognition from the customer. We’re confident that this not only fulfills our commitment to premier performance, superior customer service and world-leading expertise in climate solutions, but also sets an excellent example for more chiller owners in the real estate industry, especially those with sustainability ambitions.”

[1] The *Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer* is an international agreement to gradually reduce the consumption and production of HFCs.