projective

Chilled water energy savings and R22 replacement at pharmaceutical sites

Our Process Energy model was key to understanding the various chilled water systems, allowing us to join several systems together and implement intelligent user control.

The Challenge

We were tasked with surveying the chilled water systems at two secondary manufacturing facilities in Ireland.

These sites comprised a number of major cooling systems primarily serving HVAC users with chilled water at 5-6°C. The energy consumption of these systems was over 5GWh per annum. Several chillers and direct expansion (DX) units contained R22 refrigerant, which is due to be phased out by 2015, and so needed to be replaced.

"This centralised system has increased efficiency and reduced production risk"
Tim Jones, Director, Projective

Benefits

- Electrical **savings of €150,600** a year
- Carbon dioxide **savings of 934 tonnes** per annum
- Ageing R22 chillers replaced with **high efficiency units**

Methodology

We undertook a Process Energy review of the various systems, which allowed us to clearly define the requirements of the end users. From this, we identified compatible systems that could be combined, reducing the number of replacement chillers required.

This also increased overall generation efficiency and minimised production risk resulting from plant failure. A number of DX units containing R22 refrigerant were incorporated into the main chilled water systems. From the Process Energy review, areas for improved user load control were identified. Once these were addressed, we were able to achieve energy savings on the secondary distribution pumps by implementing a constant pressure but variable volume system.

Further enhancements were achieved with intelligent chiller sequencing and dynamic set-point control to take advantage of cooler ambient conditions over the winter months.

Electrical consumption of the chilled water systems was reduced by over 33%. By joining suitable systems together the cooling systems were made more robust.

The Result

We undertook the design, project management and commissioning of all work on the chilled water systems. The project delivered a saving of 1700MWh per annum, which equates to €150,600 per annum.

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