

# Case Study



## > Harrogate International Centre

Taking centre stage in a town which was once a favourite spa retreat for the Victorians, the Harrogate International Centre is now one of the world's top conference and exhibition venues. Replacing existing R11 chillers, Airedale water-cooled systems are providing enhanced cooling of the 2000-seat auditorium, adjacent hotel and exhibition halls. Designed to meet restricted access and space restrictions, the new chillers were installed without disrupting the Centre's normal business operation.



## Case Study

Harrogate International Centre

### Harrogate International Centre – Cooling Requirements

The 2000-seat auditorium of the Harrogate International Centre (HIC) is interlinked with eight exhibition halls and hotel, together offering integrated conference, exhibition, banqueting and entertainments facilities with diverse cooling load requirements. Avoiding any interruption to normal business operation, HIC management wished to replace two ozone-depleting, potentially hazardous R11 chillers installed when the HIC was opened in the early 1980s, with a more efficient system that would provide a reliable, comfortable environment for audiences, delegates and visitors alike. Continuous system operation is essential in the business critical and entertainment arena of HIC and, faced with escalating fuel costs and stricter environmental regulations, an energy efficient system is regarded as a priority.



### Design Criteria

HIC design consultants Silcock Leedham has worked closely with Airedale to engineer two water cooled chillers designed to provide 'dynamic' cooling based on diversified loads to reduce energy consumption and running costs.

### Unit Specification

- > Two Ultima Water Cooled (UWC) 1200D packaged screw compressor chillers

With a nominal capacity of 1100kW, the UWC chillers designed for HIC are dual circuit, fully-packaged and configured with two screw compressors set in an acoustically-lined enclosure. Screw compressors are noted for their reliability, durability and lower sound levels.

Set as 'run and standby' and pre-supplied with non-ozone depleting R407C refrigerant, the two UWC chillers utilise far less refrigerant charge than the chillers they have replaced and are a lot more efficient. One unit is able to manage the whole system.



UWC 1200D designed for HIC

### Flexible Solution

Says Bill Leedham of Silcock Leedham: "Rather than rely on a straight 'like for like' cooling duty replacement, we carried out a detailed cooling load calculation and analysis to include diversified loads from the auditorium, hotel and exhibition halls to give a realistic 'dynamic' cooling duty for the water chiller selections.

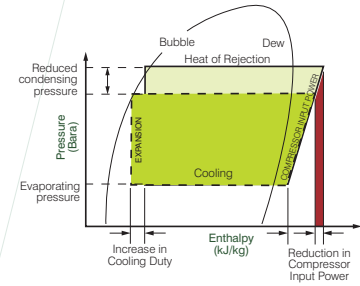
"Following analysis of the site-wide cooling load, it is anticipated that the peak site-wide load equates to approximately 4.9MW. This load can be diversified, after taking account of the site operating protocol, to 2.9MW. Of this diversified load, 0.65MW of load is delivered by the existing reciprocating chiller. The peak design chilled water flow and return temperatures are 5.5°C flow and 10.5°C return and are scheduled dependant upon load to minimise running costs.

"The plant room has been configured such that a third 1.2MW water cooled machine can be installed to replace the existing reciprocating machine. The condenser water cooling system and associated cooling towers have been selected to accommodate the future potential increase in capacity."



## Fine-tuned for Energy Efficiency

An intelligent AireTronix controls system with Trend interface, linked to the site BMS, ensures accurate operation of the chiller components. In addition to controlling the screw compressors, the microprocessor also supervises electronic expansion valves which maximise energy efficiency in part load conditions. An innovative power monitoring system to replace conventional power meters was specifically requested by HIC for internal energy monitoring.



## Restricted Access

Access limitations necessitated building and structural modifications to the plant room to facilitate removal and installation works. Adds Bill Leedham: "Maintaining cooling throughout installation to ensure the normal, continued business operation of HIC was pivotal to the programming and implementation of the replacement of the water chillers."

Says Airedale technical support manager Tony Bedard: "Installation was carried out at specific times of the year when capacity requirements were reduced. We specially built and configured the UWC chillers, saving space wherever possible, so that they would fit into the plant room. By a process of modelling, we ensured they could be manoeuvred through the restricted access and into position. While this was carried out, pipe work had to be diverted and pumps moved to maintain cooling. The project had to be well choreographed."



HIC director Stuart Quin says: "The changing needs of our clients and visitors now dictate that we have an up-to-date and effective method of "comfort cooling" across the HIC complex, which hosts over 300,000 business visitors every year from across the world. The system was introduced with no disruption to our events programme and has delivered the performance required of it."

## Planned Maintenance Improves Payback

Planned maintenance helps prevent breakdowns, crucial in an environment such as HIC, and improves energy efficiency particularly by keeping a system at its optimum setpoint. The rewards for HIC are reduced running costs, quicker payback and potentially longer life and for the environment, less carbon emissions. Running costs represent a major proportion of the lifetime costs of a chiller and far outweigh the capital costs of the system. Airedale Service has been awarded the maintenance contract for the two Ultima chillers giving HIC the peace of mind of a 24/7 call-out service.



## UWC Standard Product Specification

- > 75 - 450kW nominal cooling capacities\*
- > 45 models
- > Standard, Quiet and Super Quiet variants
- > Advanced AireTronix controls technology
- > Multiple scroll compressors\*
- > Dual independent refrigeration circuits
- > Electronic expansion valve technology
- > Compact unit footprint
- > Designed for energy efficient operation
- > High efficiency plate heat exchangers\*

\* Non-standard specifications available on request



Ultima Water Cooled Chiller

- > For the latest information on our products please visit : [www.airedale.com](http://www.airedale.com)
- > Please refer to the technical manuals for more detailed information
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