

TREND CASE STUDY

A Trend BEMS is a liquid asset for Hull and East Yorkshire Hospitals NHS Trust

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Keeping a water supply system on a large site free from leaks and dealing with them as they arise can be difficult. It is a problem that Castle Hill Hospital – part of the Hull and East Yorkshire Hospitals NHS Trust – faced, but the innovative use of a Building Energy Management System (BEMS) from Trend is keeping the problem under control.



Formed in 1999, the Hull and East Yorkshire Hospitals NHS Trust operates from two main hospital sites – Hull Royal Infirmary and Castle Hill Hospital – and also offers a number of additional community services. As well as providing excellent levels of care, the organisation is committed to minimising waste and enhancing its environmental credentials wherever it can.

View from a hill

Located in Cottingham, East Yorkshire, Castle Hill Hospital houses cardiac and elective surgical facilities; new medical research teaching; day surgery facilities; and an ear, nose and throat (ENT) facility. In recent years there has been multi-

million pound construction work to create a £30m cardiology centre as well as the Queen's Centre for Oncology and Haematology, which provides specialist cancer care for patients across East Yorkshire, North Lincolnshire and parts of North Yorkshire.

A resilient water supply system is a fundamental part of any hospital infrastructure, and preventing leaks eliminates a significant amount of water wastage and unnecessary cost. This responsibility falls to Castle Hill Hospital's estate management operation, which also works closely with the Trust's sustainability team to make improvements to its overall

operation. Paul Wharram (Assistant Sustainability Manager) at the Hull and East Yorkshire Hospitals NHS Trust, explains, 'As part of our corporate social responsibility (CSR) based objectives we do all we can to reduce our impact on the planet and we are working towards having our environmental management system (EMS) certified to ISO 14001.'

It was while evaluating its water usage that an anomaly was identified, which was initially put down to the opening of the new oncology and cardiology centres. However, further investigation pointed to an alternative cause. Castle Hill Hospital is supplied by a single water supply that is delivered to break tanks on-site and from there it is pumped into a distribution system. The water system is buried underground and consists of cast iron and plastic lines and although the site has always had small leaks it was found that a number of larger leaks were causing major spikes in the supply.

Digging deeper

When looking back at the past 20 years of water consumption, a steady increase in water delivery through the supply meter was identified.

Using the data collected from night-time flow measurements – commonly known as night lines – water consumption was monitored.

The night time base line water consumption level was as high as 10 l/s at times and to identify areas of the site where the higher than expected consumption was occurring, a programme was initiated that involved using valves to close off sections of the water distribution system. These indicated that when some sections were closed off, the night-time base line for consumption could drop as low as 2l/s. A specialist water contractor was brought in to pinpoint and repair leaks on these sections.

‘Following the location and repair of water leaks, we reduced the water consumption by 30 per cent in the first financial year,’ states Paul Wharram. Although leaks still occur, consumption is being kept initially below 10,000m³ a month and from December 2013 to June 2014 the average monthly consumption fell below 9,000m³.

Cause for alarm

Quickly identifying the presence of any leaks in the water supply system is vital in order to initiate prompt remedial action and limit any damage.

Peter Moore, Trend’s Key Account Manager, explains, ‘To provide a truly sustainable solution, the team at Castle Hill Hospital recognised that an appropriate leak indication strategy would need to be put in place. Also, as much of the data used to identify anomalies in the water system is collected outside of normal working hours, manual data collection or interpretation was not an option. It was at this point in the project that attention turned to the site’s Trend BEMS which, as well

as controlling the built environment, has powerful data acquisition, interpretation and presentation capabilities, making it ideal for this task.’

In addition to monitoring and controlling Castle Hill Hospital’s plant and building services, the Trend BEMS has now been configured to capture water consumption data and identify the occurrence of a leak by benchmarking this metric against the agreed acceptable base line usage. As the night lines for water consumption have now fallen to less than 0.8l/s, the BEMS monitors the incoming water supply to identify whether water consumption exceeds the night time base line water consumption level of 1l/s, to confirm that no significant leaks are present for that period.

For any 24-hour period where this minimum 1l/s base line is not achieved an alarm is generated and displayed on a Trend IQView8 at 9:00am each morning. Moore comments, ‘IQView8 is perfect for this job, as it has an eight inch full colour 16:9 touch screen display that provides a self-configuring user interface to a Trend BEMS. As well as monitoring alarms, it enables the user to view and change operating times and make adjustments to controller parameters. However, the most noticeable feature of the IQView8 is its ability to display schematics that show live information from the system.’

Following an alarm event, the estate management team follows a set of clearly defined procedures to achieve a rapid and controlled response, including a full ‘walk around’ of the site. A process of partial shut downs is then instigated out of hours to identify the exact location of the leak and repair it.

Glass half full

The work carried out by the sustainability team and the estate management team at Castle Hill Hospital has created a massive re-evaluation of how water is viewed and used within the Hull and East Yorkshire Hospitals NHS Trust as a whole.

‘Water was seen as relatively inexpensive, so was not high on the list of priorities,’ concludes the Hull and East Yorkshire Hospitals NHS Trust’s Nick Harrison (CHH Estates Operation Manager). ‘However, once the issue was identified our use of this resource and, in particular, the problems caused by leaks, came into sharp focus. The key performance indicators (KPI) generated by the Trend BEMS play a fundamental role in proving that water leakage is being proactively managed and kept to a minimum. As well as being a vital part of the process of continual improvement for our ISO 14001 certification, it has also strengthened the case for further work to be carried out in other areas of our utilities infrastructure.’

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