

# TREND CASE STUDY

## Trend integral to keeping Leeds Teaching Hospitals Trust fit and healthy

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Due to their large and often complex water supply systems, hospitals are potential breeding grounds for the bacteria that have the potential to cause Legionnaires' disease. Leeds Teaching Hospitals NHS Trust is leading the way in risk mitigation and compliance through the innovative use of a Building Energy Management System (BEMS) from Trend Control Systems, which monitors, controls and provides information regarding the status of the water supply, storage and distribution system.



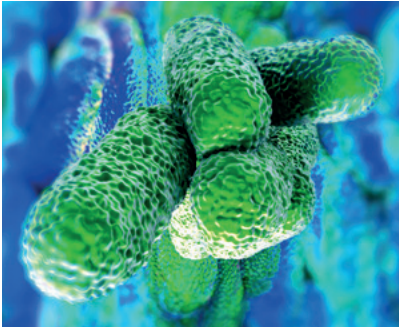
One of the largest teaching hospital trusts in the NHS, Leeds was formed in 1998 and is one of the main tertiary centres in the North of England. It is comprised of a number of individual facilities throughout the city including St James's University Hospital, Chapel Allerton Hospital, Seacroft Hospital and Wharfedale Hospital. It also includes the world famous Leeds General Infirmary, which has been providing patient care for well over 200 years.

Like all other hospitals and health estates, infection prevention and control is a major concern for Leeds Teaching Hospitals. With a tool such as the Trend system, the hospital Trust has taken infection control and

monitoring to the next level. If left uncontrolled Legionnaires' disease is a potentially fatal form of pneumonia that can develop within the large water supply systems. It is common in natural water sources such as rivers, lakes and reservoirs, but usually in low numbers. The bacteria may also be found in purpose built water system infrastructures and, unless conditions are kept within defined parameters, they can thrive in hot and cold water systems. Once the bacteria proliferate, Legionnaires' disease becomes a distinct possibility and it is therefore important to control and reduce the risk of this happening by introducing appropriate measures.

Geoff Harris is Craftsman Specialist (BEMS) at Leeds Teaching Hospitals, and explains, 'Health Technical Memorandum 04-01 (HTM-04) and The UK Health and Safety Commission's Approved Code of Practice (ACoP) L8 provide guidelines that offer guidance on how best to prevent it. Through the Trust's Water Safety Group we take the issue very seriously and wanted to develop a multi-site system that could be centrally managed to offer the highest levels of protection. This meant installing an automatic early warning system which alerts key staff if water quality conditions fall outside pre-defined levels.'

Rather than installing a separate control system for this purpose, or employing extra staff to help manage the existing plant, Geoff was convinced that the legacy BEMS could offer a solution. Leeds Teaching Hospitals has worked with Trend for many years and its BEMS comprises over 700 individual products, including our first generation IQ1 and IQ2 devices that still work perfectly and are fully backwards compatible with more recently installed IQ3 and IQ4 products. By integrating



the Legionella monitoring systems into the existing Trend BEMS infrastructure, Geoff made it possible to monitor, control and inform about a range of conditions relating to the status of the water system as required by the Trust's Environmental Manager, Libby Moss.

The Water Safety Group developed a 6 step action plan to ensure they achieved the desired outcomes for management and control of their water systems, namely:

- 1) Storage Tank temps
- 2) Storage Tank turnover
- 3) DHW Flow and return temperatures
- 4) Chlorine dioxide water dosing
- 5) Chlorine dioxide gas leakage
- 6) Automatic flushing of DHW and DCW systems

1) The cold water storage tanks across the estate are monitored and alarmed to check that the water temperature stays below 24°C, as above this level Legionella bacteria can grow. If the tank temperature does exceed the threshold, water is drawn off and replenished until the temperature is reduced and the alarm condition is resolved. Email and text messages can also be sent to designated personnel, who can respond quickly and appropriately

2) HTM-04 recommends that water stored in tanks is 'turned over' every 12 hours to guarantee a fresh supply. Tank turnover is therefore monitored and alarmed to make sure it is appropriately sized for its location. If

an individual tank does not reach the correct turnover in 12 hours, an alert is issued.

3) DHW flow and return temperatures are monitored across the estate and throughout the various buildings, wards and departments. An alarm is raised if any individual DHW return temperature falls below 50°C for a prolonged period (>15 minutes). This allows the Trust to react to, and resolve the problem long before there is any risk to staff, patients or visitors.

4) Chlorine dioxide is added in tightly controlled amounts to the water and levels are closely monitored. Should levels fall below 0.2 parts per million (ppm), alarms are sent to both in-house personnel as well as the water treatment company contracted to carry out this work. Engineering staff also monitor the chlorine dioxide level on an ongoing basis through the Trend 963 Supervisor. Furthermore, relevant data is imported from the 963 Supervisor's SQL database into third-party monitoring software, which plots it and sends automated weekly dashboard graphs to the water treatment company to help them monitor the performance of the dosing equipment. The 963 Supervisor is a graphical, real-time user interface that enables users to monitor specific activities and make any necessary changes. Security settings ensure that an individual is only presented with information and functions that are relevant to their authority or task, ensuring that consistent standards of operation are maintained.

5) The water dosing equipment is sometimes installed in spaces with limited natural ventilation. Should a high level of chlorine dioxide be present, as a result of a spillage or leak, the resultant gas could prove harmful to the health and safety of operatives. Therefore, Trend monitors

chlorine gas levels and if readings are greater than 0.3ppm an alarm is raised so that the water treatment company can send in appropriately trained personnel with the correct PPE to resolve the problem.

6) Finally, to avoid poor circulation within water systems, Geoff has used the Trend system's outputs connected to solenoid valves in some areas to ensure infrequently used sections of pipework are flushed for a pre-determined duration twice a day.

Integrating its Trend BEMS into the water quality management system at Leeds Teaching Hospitals has proven to be a key management tool. Geoff, Libby and the rest of the team firmly believe that committing to their Legionella monitoring and control policy in this manner has enhanced their ability to maintain compliance, to be resilient in a sustainable manner and is business imperative.

In conclusion Geoff says, 'The health and safety of patients, staff and visitors is of paramount importance to the Trust and the data produced by the Trend BEMS, along with the alarm system, makes our infrastructure highly resilient and drastically reduces risk of water borne infection. However, the benefits don't stop there, if the Trust didn't use the BEMS to monitor the DHW systems, manpower and resources would be diverted from other maintenance functions, with obvious consequences. A sustainable system means that the Trust is able to work smarter and, at the same time, achieve complete compliance with HTM-04 and ACoP L8.'

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