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Reimagining Legionella Risk Management with IoT

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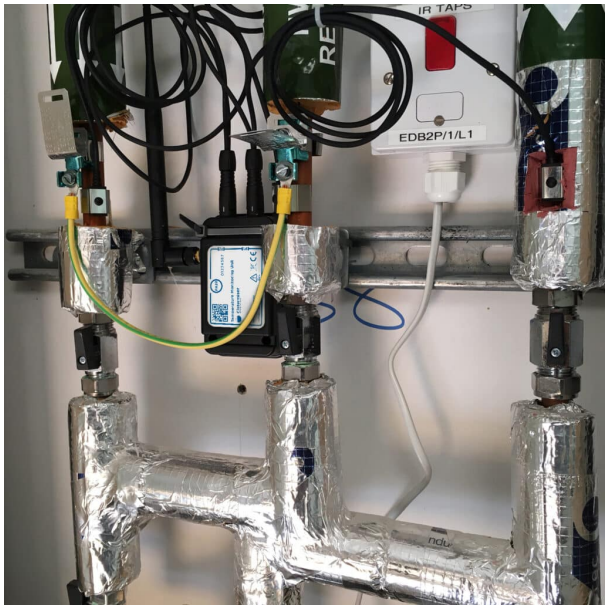

Legionella has been making headlines recently, and not for the right reasons. These waterborne bacteria, responsible for severe respiratory illnesses, like Legionnaires' disease, pose a significant public health risk, especially when they are not managed properly. The traditional approach to Legionella risk prevention, relying on manual, labour-intensive readings at monthly intervals of water systems, has proven insufficient, and can miss outbreaks that can occur between these readings, leaving room for improvement.

By harnessing the power of IoT and automation, alongside the use of low power sensory devices and powerful network connectivity, this method for monitoring the water outlet and sentinel temperatures within the pipes of water systems can be streamlined, offering benefits for health and safety, compliance, and the bottom line. Gareth Mitchell, UK Partner Manager, Heliot, and Richard Braid, Managing Director, Cistermiser explain.

The Legionella Problem

Legionella bacteria is found in both freshwater environments and man-made water systems, and can become a health risk in the latter when it is allowed to spread. This most often occurs when water remains stagnant and reaches temperatures that are conducive to Legionella growth. By inhaling water droplets from these contaminated sources, people can develop Legionnaires' disease, which results in similar symptoms to a lung infection.

In the UK and the EU, Legionella outbreaks are not uncommon, occurring at a rate of around 1.9 cases per 100,000 people in the EU in 2020, for example. These outbreaks can have severe consequences, both in

terms of public health and in terms of business compliance. Although specific statistics may vary from year to year, they consistently underscore the importance of effective Legionella management. For instance, just consider the recent backlash off the back of the recent news about the Bibby Stockholm barge and the health and safety crisis that occurred.

Additionally, the Health and Safety Executive (HSE) in the UK provides crucial guidance for Legionella monitoring to be adhered to. This guidance emphasises the importance of proactive management to prevent outbreaks and maintain public safety. Compliance and reporting according to HSE regulations is vital, and failure to do so can result in significant legal and financial consequences.

Reinventing the Monitoring Process

For many organisations, the current process for Legionella risk management relies on labour intensive processes and could be enhanced and streamlined. Monthly readings are typically taken at sentinel points within water systems, which is both resource-intensive and costly to many organisations. This is because they often involve using a person to take readings of water systems, using paper-based systems to keep track and record measurements. The challenge with using this paper record-keeping and manual approach introduces the chance of human error creeping into taking and recording readings.

Furthermore, and importantly, relying solely on monthly readings increases the risk of missing Legionella outbreaks that occur between readings. All of this is exacerbated by the fact that readings are often taken by non specialist staff, rather than experienced, highly trained industry professionals. For example, this kind of job can often be passed down to an office manager or other kind of support staff within an organisation who may have other duties to execute.

An automated IoT solution, on the other hand, provides real-time monitoring through sensory devices connected to water pipes. These devices ensure continuous surveillance of the temperature of the water inside pipes throughout a building, eliminating the potential for missed outbreaks in between readings. The data collected by these readings is then transmitted and stored in the cloud for management teams to assess and draw insights from.

Once the time comes to submit relevant readings to the HSE, in compliance with the HSG274 regulation, a logbook can be generated quickly by this kind of technology, collating the information in a compliant reporting document, demonstrating the real-time insights that traditional methods cannot match.

The Role of Technology: IoT, Connectivity, and Operational Efficiency

IoT technology, powered by sensors and connectivity, is at the heart of automated Legionella detection solutions. These sensors can, for example, continuously monitor parameters such as water temperature, flow rates, and chlorine levels. Dashboards and alerts generated by these automated solutions are invaluable for compliance with HSE legislation. Facilities managers and those responsible for Legionella monitoring within buildings can access real-time data and respond swiftly to deviations from safe conditions, such as a drop in temperature below safe levels at sentinel points in the building. This way, Legionella risk can be more effectively managed – not to mention the reporting capabilities that help produce an HSE compliant report.

Within this IoT set up, Sigfox connectivity plays a pivotal role in the IoT-driven transformation that supports and automates Legionella risk management. Sigfox’s Low Power Wide Area Network (LPWAN) technology

enables the efficient transmission of data in real time, through the use of sensory devices connected directly to water systems. This network connectivity and capability is crucial for the rapid detection and response required in Legionella prevention.

Ultimately, this new approach to Legionella detection, involving IoT, sensors and the Sigfox network connectivity involves fitting sensors directly to sentinel points in the building. This is helping to change and enhance the current Legionella risk management business process – and is enabling subsequent related labour and transport costs to be reduced. For instance, unlike traditional methods that require contractors to physically travel to locations for readings, IoT solutions offer remote monitoring – meaning that staff can be deployed to other operationally important tasks within businesses. This operational efficiency not only saves time and money but also aligns with environmental sustainability goals by saving a significant amount of water from being wasted from each manual reading too.

The Importance of IoT Device Design and Connectivity

Typical IoT devices used in this scenario are designed with practicality in mind. They are compact and easy to install onto existing pipework, making them suitable for a wide range of water systems. Importantly, these devices are optimised for LPWAN connectivity, ensuring that they don’t drain battery power quickly when compared with more power intensive networks. Typically, these devices have a lifespan of 3-5 years, providing reliable, long-term Legionella monitoring.

In comparison, cellular-based solutions, while generally available, are relatively more costly and potentially unsuitable for this application due to the location of sentinel points in buildings and lack of connectivity. Sigfox’s LPWAN connectivity is a cost-effective and reliable alternative approach that aligns perfectly with the requirements of Legionella monitoring, enabling effective transmission of data in hard to reach locations, such as basements, where these pipes are often found.

Conclusion

The reinvention of Legionella risk management through IoT and automation is not only solving a pressing problem, but also setting the stage for more efficient and responsive monitoring in various scenarios. Sigfox’s role in providing IoT device connectivity here is enabling this transformation, and it cannot be overstated. Beyond Legionella and the water management industry, the Sigfox network can be applied to a wide range of scenarios too, ushering in a new era of connectivity, efficiency, and safety. As technology continues to evolve, the IoT-driven approach to Legionella management will likely become more standardised, ensuring the safety and well-being of communities worldwide.