BT

Helping UK water companies develop an intelligent sewer system

Case study: Sewage capture

Cutting sewage spillage through smart monitoring

Business challenge

The Environment Agency (EA) and Ofwat, the water regulator in England and Wales, are pushing water companies to meet progressively higher standards for environmental protection. As part of this regulation, the water sector has to make sure more wastewater is treated before sewer overspills are allowed back into the environment. This comes at a time when storms caused by climate change can quickly increase the amount of wastewater in the system.

We're positioning ourself as a trusted partner of the water companies, committed to providing the predictive maintenance technologies required to hit EA environmental targets. We're determined to help build an intelligent sewer network across England and Wales using Internet of Things (IoT) connectivity.

Digital opportunity

Curbing the environmental damage caused by sewage spilling into rivers is one of the biggest challenges facing UK water companies. The current solution focuses on improving four key areas separately: spill reduction, sewage storage optimisation, pump risk management and flow attentuation.

We see an opportunity to bring these solutions together into a single autonomous sewage capture system. We can network the smart monitors already being used by the water companies – as well as help them develop new monitors. These battery-powered devices don't require the constant, high-speed connectivity provided by 5G networks. Instead they need periodic connectivity across a wide area. We can help the water companies by deploying our LPWAN (Low Power Wide area network) IoT solution to provide efficient and effective connectivity.

We propose networking the water sector's sewage pump monitors and spill alarms to help reduce the amount of wastewater allowed back into the environment.

Key to the success of a smart sewage treatment network is the development of a data visualisation platform. An intelligent platform will capture data from multiple sensors, integrate it, cross-reference it, analyse it and apply business rules to it. Not only will the platform pinpoint sewage spills in the early stages, but it will also identify whether a robot or human engineer is needed to fix them.

A human engineer might still have to fix a broken pump. But a machine-learning algorithms could automatically open and close sluice gates to divert an overspill to a sewer with spare capacity. It could learn from each situation as it progresses and also understand how to prioritise workflows.

Our vision at BT is to turn a hydraulically managed Victorian sewage infrastructure into an intelligent system through the networking of IoT sensors. We aim to build a data mechanism that can make its own decisions through robots.
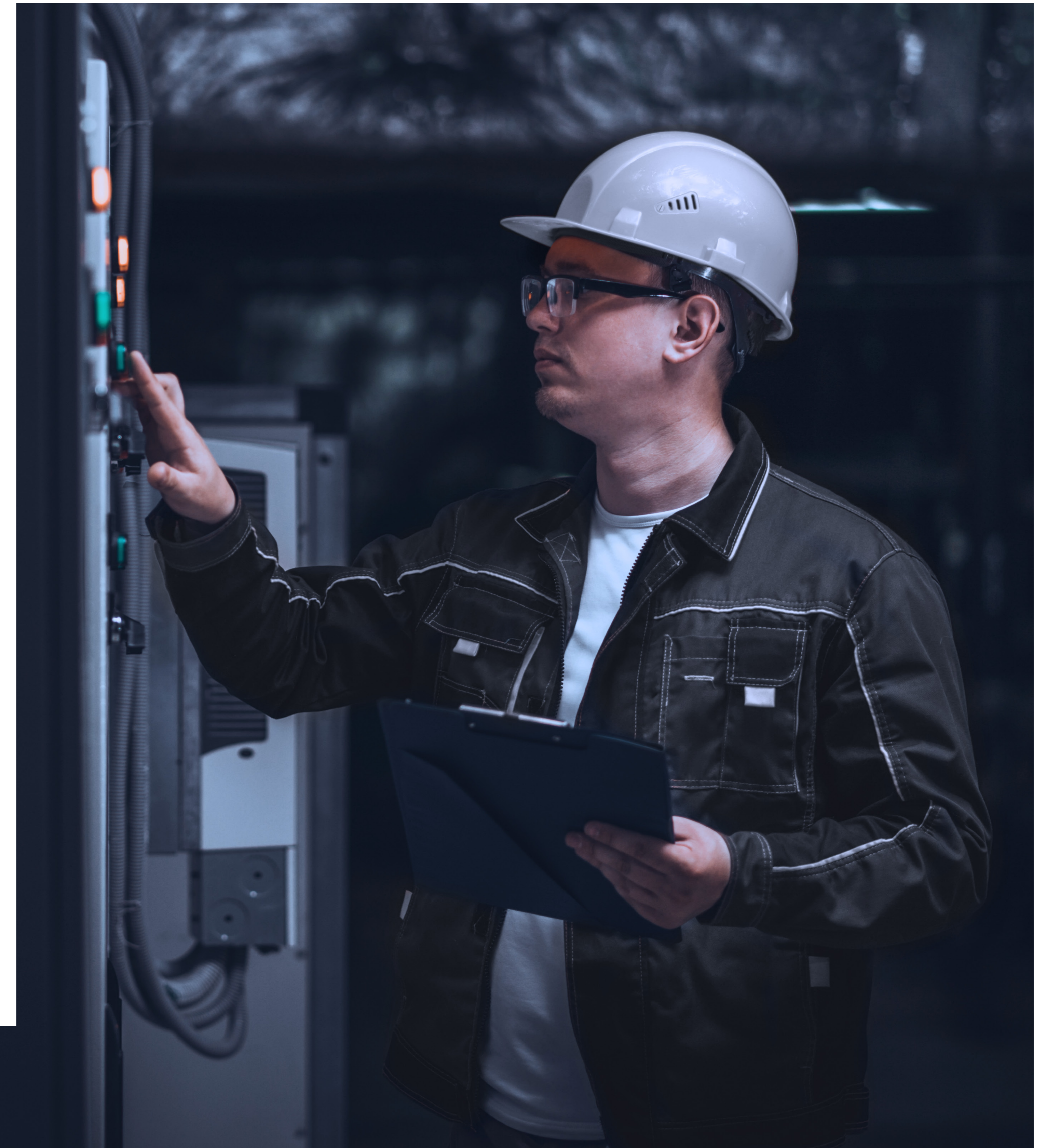
Sewage capture trial

We're partnering with **Severn Trent** and five other water companies to test the development of an autonomous sewage capture system across a **six-mile section of Alfreton** in the Midlands. Our test case automatically optimises sewage storage and pump maintenance to reduce the risk of spills, keeping a calm flow through the network.

To devise the best possible solution, we're collaborating with technology leaders Microsoft, Rockwell, Blackburn Starling and 8Power, plus water experts at the University of Exeter.
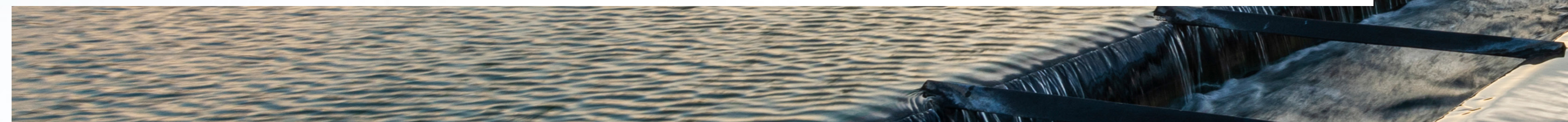
Smart sewer network

We're helping design an intelligent sewer network in the West Country. Our machine-learning algorithms identify sewer-pipe blockages and false alarms during storms by comparing water-level data with past trends and upstream rainfall intensity. They're also used to identify internal defects in pipes by analysing CCTV footage. In both cases, the need for human inspection is reduced.

Security assured

One of the key barriers to water company adoption of networked technologies like predictive maintenance, driven by IoT connectivity, is caution over its reliability and vulnerability to cyber-attacks,s which could interrupt water supply. Our networked control devices always have a security wrapper to protect them against cyber-attacks.

This comes with the reassurance of being developed by our 3,000-strong expert UK cybersecurity team, which prevents more than 125,000 attacks per month.

Cleaner, safer rivers

Due to its huge potential to solve one of the water industry's biggest challenges, our ecosystem has secured backing from Ofwat's £200 million breakthough innovation fund.

Like us, Ofwat is confident our intelligent sewer technology, which has proved 93% accurate in the West Country, will revolutionise future spill management.

This will significantly reduce river pollution, protecting aquatic plant and animal life, as well as the humans that use rivers for their leisure activities.

Overall it will deliver a cleaner natural envionment for everone to enjoy, and enable water companies to hit one of their key Ofwat targets and liberate investment.

To find out more about the digital opportunities identified in the water sector, please contact:

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