

High-tech system can halve time taken to locate leaks

As plunging temperatures increase burst pipes, the latest technology is helping us **reduce the time it takes to find leaks** in London.



Our leakage experts are pioneering the use of new technology, which has seen much of our pipe network fitted with a 'central nervous system' that is enabling leaks to be detected and fixed more quickly.

The system is helping us fight leakage in the face of the early onset of snow and ice, which saw bursts and leaks more than double.

The 'Water Infrastructure Monitoring System' developed by Israeli software company TaKaDu analyses increases in flow or pressure detected by 'district meters' and pressure sensors buried underground throughout our supply network.

By comparing flow and pressure patterns, it assesses whether this is due to a wide range of potential causes – for example, rising demand or work we are doing locally. If the cause is leakage, it can often show the leak's likely location to within a few streets.

Efficiencies

The TaKaDu system is currently monitoring 6,500 miles of mains in London – more than a quarter of our 22,000-mile network. Once the results of this have been assessed, we will consider whether to extend it further.

The system was originally trialled from April on 2,000 miles of mains in 19 locations in London, and in a smaller area in Guildford. It proved most successful in the centre of the capital, which resulted in the greatest efficiencies in detection.

Leakage Manager Tim McMahon said: "We aim to lead the way with innovation and new technology, and are certainly doing so in this case.

"We have been world leaders in exploring this technology,

and in some areas have been able to pinpoint leaks twice as quickly as before."

Modelling Manager Rob Casey explained: "Water infrastructure monitoring is a fairly new concept. It takes the flow and pressure data collected by SCADA systems, and information from other systems such as GIS, and uses pattern recognition to detect whether or not a leak is happening.

Surprised

"The key thing is that it helps us locate leaks much faster. Using more conventional technology, it might take us two or three days to determine from district meter readings that a leak had started up. The TaKaDu system can find it within hours.

"All the data processing is performed remotely, so we haven't had to install any software or hardware to use the system."

Rob added: "We are probably the first company to use this in a major way. Some trials were carried out in Jerusalem, but nothing like on the scale we are doing here."

The TaKaDu system works by detecting statistical anomalies in data, compared to what it recognises as 'routine behaviour'. It automatically highlights deviations from the norm that cannot be explained, for example, by weather, holidays or overall changes in consumption.

Leakage Analyst Aliakber Ravji (pictured) said: "When it was first introduced, I was very sceptical about how it would provide me with alerts and how much of my time would go into looking into the data.

"However, I've been pleasantly surprised. The main feature which has really helped our detection crews is the mapping element,

which highlights the district meter areas in which the leak is taking place as well as the probable location of leakage. I'm grateful for being given the chance to carry out the trials."

The system can also show if a repair has been mistakenly reported as complete, and has identified faulty meters, data transmission issues and pressure fluctuations.

In some cases, it has shown that unexplained water loss which we had assumed was leakage is actually due to customer usage.

Omry Tuval, senior TaKaDu

engineer, said: "There was a case of unexplained flow in Guildford. Our system received data from eight pressure loggers placed in the local system, which quickly identified the exact location and proved that the water was being used legitimately – allowing Thames to reduce its local leakage figure."



Finding and fixing leaks reduces the likelihood of bursts like this occurring.