SUEZ Satellite Leak Detection Transforms Water Management for SES Water

Case Study – SES Water

Revolutionising SES Water's mission for water management and conservation

Sutton and East Surrey (SES) Water is a water supply company serving a large region in southeast England, primarily covering parts of Surrey, Sussex, and London. It supplies 160 million litres of clean water daily to over 745,000 people, with a supply area of 322 square miles. SES Water is committed to ensuring the reliable delivery of high-quality water while maintaining a focus on environmental sustainability and resource management.

The issue

Leak detection is a challenging task for Sutton & East Surrey (SES) Water, a UK water supply company that is committed to reducing water leakage by 24% by 2030. However, detecting leaks can be daunting especially as it covers a vast area with 3,400 kilometres of drinking water mains, serving over 300,000 homes and businesses. It supplies 160 million litres per day of potable water to approximately 745,000 people, serving areas of East Surrey, West Sussex, West Kent, and South London. It operates 31 service reservoirs, 23 pump stations, and 8 treatment works covering 835 square kilometres.

The solution

To address the challenge of leakage detection, SES Water sought the expertise of SUEZ, which tapped into the advanced satellite leak detection solution provided technology partner ASTERRA.

Using Synthetic Aperture Radar (SAR), a remote sensing technology that uses radar signals to create high-resolution images of the Earth's surface, ASTERRA was able to identify likely leak locations. The satellite data was overlaid with the pipe network Geographic Information System (GIS), highlighting sections with potential leaks.

The results

From over 1,000 km of pipes analysed, 211 likely leak locations were identified. A total of 2019 leaks were confirmed through 59 days of field inspection. This equated to 3.7 leaks per crew day and 2.2 leaks per kilometre inspected. The inspection team and customers reported 171 and 44 leaks, respectively. A breakdown of the leak subtypes is shown in the table below:

SES results by leak type

Mains	Distribution	Customer-side	Work order	Other
21	121	29	44	4

Notably, 94% of the leaks found were non-surfacing, highlighting the effectiveness of satellite leak detection in identifying concealed leaks and resolving them before they become a serious issue.

By analysing different types of leaks during investigations and using standard estimated flow rates, SES analysts reported a daily volumetric saving of 0.9 megalitres. This successful project, with an average of 1.1 leaks found per POI, contributes to SES's goal of reducing leakage by 15% in the AMP 7 period.

By combining the breakdown of different leak subtypes throughout the investigations and standard estimated flow rates set by SES, a volumetric saving of 0.9 megalitres per day was reported by SES analysts. The estimated savings and a result of 1.1 leaks found per POI was considered a successful project and beneficial to helping SES achieve their 15% leakage reduction target in the AMP 7 period.

Implementation

The major steps involved in the whole process are:

- The satellite captures raw images, which are then analysed and filtered
- The potential leak locations are superimposed onto a geographical map, enabling identification by the on-site team
- A leakage report is generated, available in various formats including industry-standard Geographic Information System (GIS) files or through a desktop application
- The identified leakage sites are overlaid onto a street map of the relevant region and transmitted to an app on the ALC technician's phone
- The app provides a 100-metre area for the technician to investigate and pinpoint the location of the leak

How it works

Satellite leak detection technology converts satellite radar signals into images through a process called synthetic aperture radar (SAR) imaging to identify and locate pipe leakages. It can detect up to a depth of three meters beneath the ground surface.

After overlaying the images onto maps provided by the clients, which depict the selected network or District Meter Area (DMAs), a display

is generated, highlighting points of interest (POIs) requiring investigation by specially trained active leakage control (ALC) technicians.

Differentiating factors

As leak technicians only need to cover 5% of DMAs, using satellite leak detection considerably reduces the amount of technicians required. There is more job satisfaction and therefore less staff churn, making for a more positive environment.

- Satellite leak detection is highly efficient, finding more leaks per crew day
- It is cost-effective compared to fixed acoustic listening devices and covers the entire network, regardless of the geographic area
- It provides regular, up-to-date snapshots of the network's condition, which traditional methods cannot achieve
- Satellite leak detection offers ongoing monitoring with fresh data, ensuring the network's state is regularly assessed

ASTERRA SUEZ

SUEZ Smart & Environmental Solutions
190 Aztec West, Almondsbury, Bristol, BS32 4TP
Email: Nick.Haskins@suez.com
SUEZ.COM/UK