



DHI CASE STORY

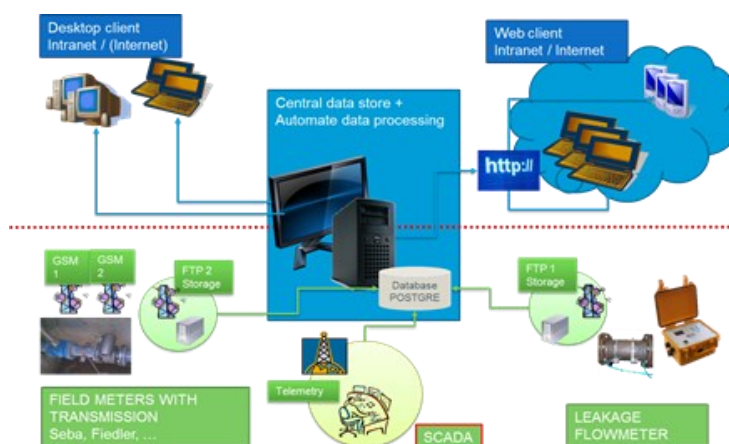
THE LEAKAGE MONITOR

Enabling sustainable Non-Revenue Water management in the Czech Republic

Many of the water distribution networks in the Czech Republic have suffered from high leakage levels. To enable sustainable management of the overall water distribution network, the network operator – Severočeské Water and Sewerage Company (SCVK a.s.) approached us for a solution. We were invited to help in the company's Non-Revenue Water (NRW) reduction strategy, the most important part of which was the implementation of our Leakage Monitor. The monitor has effectively helped to manage leakages in the water distribution networks and maintain them at stable and economically optimal levels.

CZECH WATER DISTRIBUTION – CHALLENGES IN WATER LEAKAGE MANAGEMENT

Severočeské Water and Sewerage Company (SCVK a.s.) operates the largest regional water supply system and distribution network in nearly 400 settlements in the Czech Republic.



Data collection and result distribution working scheme of Leakage Monitor

However, many of the water distribution networks suffered from high leakage levels. They also witnessed limited balanced flow and distribution due to poor network zoning. The Non-Revenue Water (NRW) levels were mostly evaluated based on the balance of inflow and invoiced water in supply zones over a one-month period. The accuracy of this method was adversely affected by low water meter reading frequencies, seasonal changes and so on.

SUMMARY

CLIENT

Severočeské Water and Sewerage Company (SCVK a.s.)

CHALLENGE

- High leakage levels (20-40%) in water distribution networks
- Limited balanced water flow and pressure distribution due to poor network zoning
- Inaccurate Non-Revenue Water (NRW) level evaluation due to low frequency of water meter readings, among other factors
- Difficulty in calculating NRW key performance indicators due to inconsistent data inputs
- Inefficient operational management by leakage detection control managers

SOLUTION

Leakage Monitor – a software and implementation tool for complex data collection, leakage and NRW optimisation in District Metering Areas (DMAs)

VALUE

- Automatic data collection and processing
- Overview reports for fast identification of critical DMAs with highest saving potentials
- Comprehensive tools for detailed leakage analysis in the individual DMAs
- Leakage maintenance at low and economically optimal level
- Direct use of GSM and GPRS data, enabling faster and more cost-effective DMA establishment
- Enabling active leakage control, network repairs and pipe optimisation

LOCATION / COUNTRY

Czech Republic

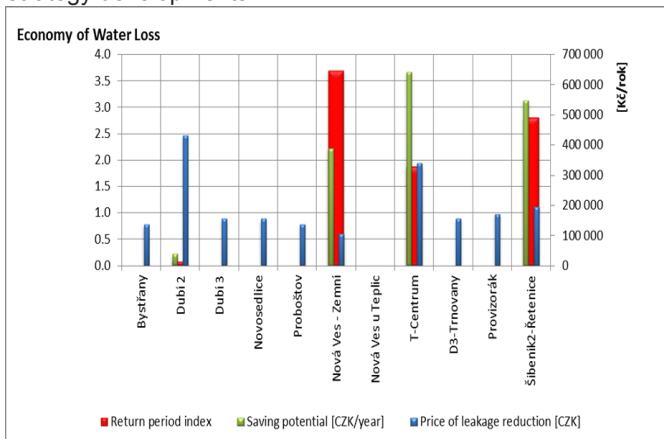
Additionally, leakage evaluations using night inflows were unsystematic, due to the immense work involved – especially in zones with several inflow/outflow points. It was also difficult to calculate NRW key performance indicators due to inconsistent data inputs. As a result, the managers responsible for leakage detection control spent most of their time evaluating the data, leaving less time for operational works management.

The NRW and leakage thresholds for supply zones were determined based on a simple technical evaluation. In many cases, incomparable workloads were required to achieve similar leakage savings in different districts. As such, the operator was not satisfied with the methodology based on pure technical evaluation.

OUR SOLUTION FOR EFFECTIVE LEAKAGE MANAGEMENT – A LEAKAGE MONITOR

In close cooperation with SCVK a.s., we developed a methodology which catered to their specific requirements. One of the most important parts of the NRW reduction strategy was the implementation of our Leakage Monitor. This implementation began in 2009 as a part of the Teplice WSS Master Plan and today covers the six most important cities in the region.

The Leakage Monitor is a software and implementation tool for complex data collection, leakage and NRW evaluation in DMAs. It's used for daily optimisation of leakage management, pipe failure detection and network repair strategy developments.



Comparison of leakage reduction works costs (blue columns) with possible cost savings on leaking water (green columns) and return period index (1 USD = 18 Kč)

CLIENT TESTIMONIAL

“ We appreciate the massive decrease in the level of leakage together with pressure optimisation due to effective network zoning design. Important factor for us is a proven long-term leakage level stability, supported and maintained by the Leakage Monitor application.

Karel Eminger—Regional Dispatching Manager—SCVK a.s.

Contact: Zdenek Svitak - Z.Svitak@dhi.cz

For more information visit: www.dhigroup.com

We developed a unique methodology to use well known theory of Economical Level of Leakage (ELL) in daily evaluation of individual DMAs. The Economical level of leakage in a supply zone is calculated based on balance between possible cost savings on leaking water and costs of leakage reduction works. This way Leakage Monitor shows DMAs with highest saving potential.

A fully functional utility information system, the Leakage Monitor assists managers with several functions. These include technical and financial water leakage level optimisation as well as decision-making with respect to:

- active leakage control, including leakage-economical optimisation
- network repairs
- pressure optimisation
- identifying leaks before they become a threat or before potential pipe bursts

SIGNIFICANT POSITIVE RESULTS

The NRW reduction strategy resulted in significant savings with respect to water leakages as well as operational costs. For example, the city of Teplice witnessed leakage levels reduction of 43% in 1 year. This equates to an estimated yearly savings of EUR 150,000. The city of Usti witnessed leakage levels reduced by 40- 45% in a two-year period. The Leakage Monitor has thus effectively helped to reduce leakages and maintain them at stable and economically optimal levels.

The monitor runs all the analyses and prepares all outputs automatically at a chosen time. The desktop application is based on our MIKE CUSTOMISED by DHI concept and provides summarised as well as detailed results. The web user interface is based on our Dashboard technology and provides an overview of all important results.