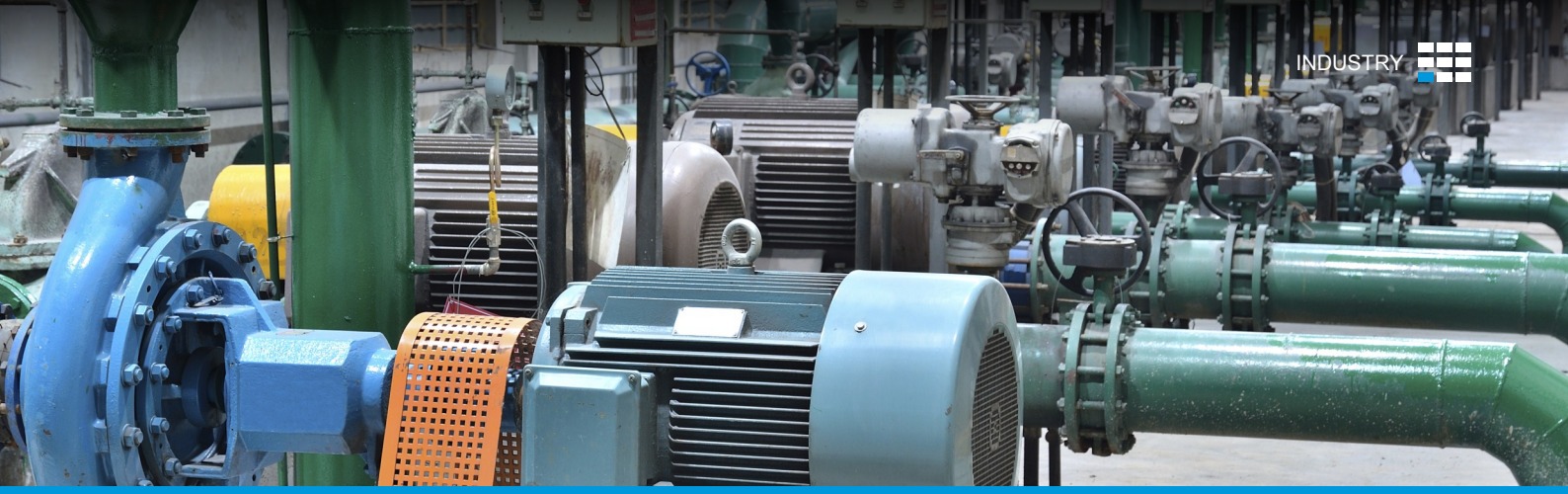


INDUSTRY

DHI CASE STORY

DEVELOPING A REAL-TIME HYDRAULIC MODEL OF SOKOLOV'S WATER SUPPLY SYSTEM

Helping Sokolov manage its water network in a smarter way

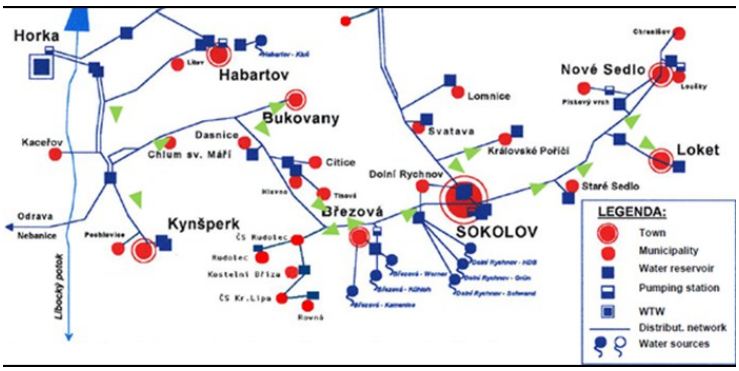
Sokolov's public and wastewater infrastructure operator VOSS has always been active in exploring latest technological solutions for a smarter water network management. In order to find the best way to operate their water network, VOSS initiated a pilot project to study new possibilities to optimise their existing water operations. To help VOSS in this initiative, we developed a real-time hydraulic model of Sokolov's regional water system to study how they can improve current conditions.

NEW SOLUTIONS TO OPTIMISE EXISTING WATER NETWORK

To further optimise Sokolov's existing water network, we came up with a modelling of the proposed water supply system. The new system mainly supplies drinking water from Horka water treatment plant to towns and villages in the Sokolov district. Water is supplied from the treatment plant to 38 reservoirs throughout the region.

In this project, we played a part in:

- construction and modification of a model within individual scenarios
- preparation of the model for hydraulic emergency assessment in selected areas of the system
- calibration and verification of the model
- implementation of the system online
- service training



The flow scheme of the public distribution system from Horka treatment plant. ©DHI

SUMMARY

CLIENT

Vodohospodářská společnost Sokolov (VOSS)/ Sokolov Water Company

CHALLENGE

- Need to study new possibilities to optimise existing water operations
- Need for a hydraulic model of the region's water supply network

SOLUTION

Development of an automated hydraulic model which can analyse network behaviour, using MIKE by DHI applications:

- MIKE URBAN
- Water distribution online software
- Water distribution tools for ArcMap

VALUE

- Understand how the water supply system may work under emergency conditions and thus create contingency plans
- Verify operations using the hydraulic model before applying them to the physical system
- Better understanding of existing water supply system

LOCATION / COUNTRY

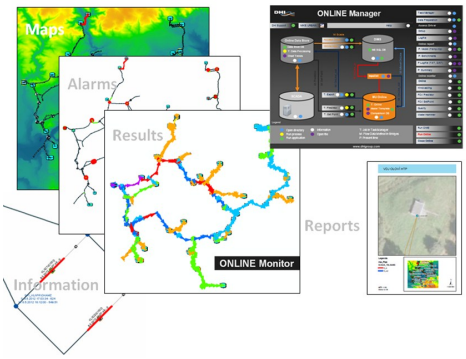
Sokolov, Czech Republic

MIKE URBAN ONLINE SYSTEM

We developed a hydraulic model of Sokolov's regional water supply system and then linked this model with the supervisory control and data acquisition (SCADA) system in real-time.

The hydraulic model operates in the online and offline mode where automatic and periodic snapshot simulation runs every ten minutes and the predictive simulation runs upon the operator's requests. The network operators can access the simulation results using a dedicated user interface. The fully automatic online mode calculates hydraulic characteristics such as flow and pressure, while the offline mode is focused on forecasts. The system is able to forecast the network behaviour within a stipulated period, within the next one day or one week, for example.

A hydraulic transient model was also developed for selected networks to analyse system behaviour, both under normal operating conditions as well as during emergency or power failure. MIKE URBAN Online System is designed to instantly support operator's decision, predict system behaviour, complete hydraulic assessment data in locations without measurements and at the same time, automate simulations.



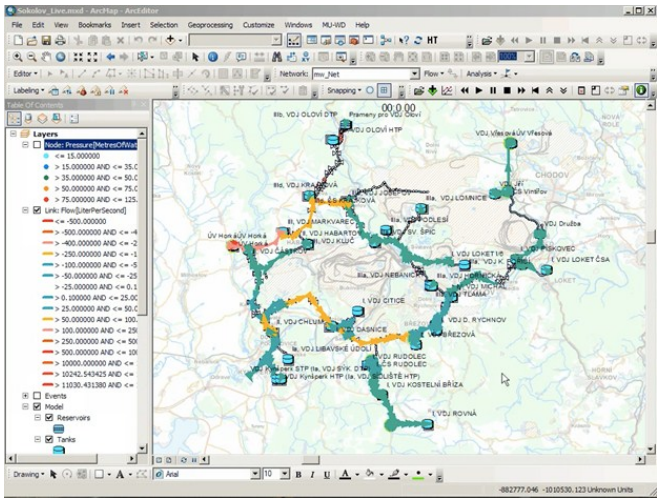
Online manager—tool for control, setting and monitoring of the system online © DHI

SETTING, CONTROL AND MONITORING OF THE SYSTEM: A SIMPLIFIED PROCESS

Our software gets the measured data from the SCADA system. The data serves as the basis to update the hydraulic model and to calculate pressure, flow, economical and quality parameters. An Online Manager tool was set up in Internet Explorer for the automatic preparation of data communication, control and monitoring within the system. With this tool, the user is able to receive help, support and access to documentation when he needs them, thereby simplifying his work process by leaps and bounds.

REAL-TIME PRESENTATION OF RESULTS

The integration of MIKE URBAN and the ArcMap application—both using the MIKE by DHI platform—means that users have the flexibility to create thematic maps of flow, pressure, speed and various evaluations on the piping network. They can also monitor dynamics of hydraulic quantities in real-time and practically create unlimited output of results easily.



Online monitor-data and results presentation in real-time in the ArcMap application © DHI

A VALUABLE SYSTEM TO BE INTEGRATED AS A STANDARD OPERATOR'S TOOL

The hydraulic system greatly benefited our client as it simplified many processes. Before the implementation of the system, a significant effort was needed by the user to define functionalities and set up conditions to interlink GIS and SCADA to the modelling platform. After the model was put in place, it became much easier for the user to quickly and specifically analyse current conditions.

The client was also able to automatically identify leakage problems and burst positions, on top of determining errors in the system, for example, when the valves are positioned incorrectly. The feature of auto calibration saves a massive amount of time as compared to other online systems, and users can define interfaces and provide updates by just using the simple Microsoft Office platform. These functions significantly increase the value of our system, which is now being progressively integrated into the existing SCADA as a standard operator's tool.

CLIENT TESTIMONIAL

> *Currently, the solution is being integrated into the dispatch system as a standard tool. I am now working on a new distribution system model and we plan to append this into the MIKE URBAN Online System eventually. Together with DHI, I try to develop new system functionalities which is very useful in our daily operations .*
> *Jan Sirmer—Adminstrator, MIKE URBAN Online System—VOSS/ Sokolov Water Company*

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