

CASE STUDY

REDIVAC vacuum sewage system monitoring



WIRELESS DATA COLLECTION SYSTEM WITH ONLINE MONITORING

Project data:

A regional waterworks installed a vacuum pump system in 2002 in a town, using the technology of Redivac, and was looking for a solution to build a monitoring network that would help the system operate more efficiently.

Challenge:

Too much electricity is used to operate the system, and too many resources are needed to maintain it: when a vacuum valve failure is detected late, the vacuum escapes from the system for a long time, it is not only difficult to find the problematic valve, but possible system failures cannot be predicted.

Solution:

Installation of WaterScope IoT metering, data collection and wireless data transmission system on the municipal sewage system: measurement of the vacuum tank of the machine house, measurement of the values of vacuum and control pressure at the pump valves and monitoring of the valve openings.

Elements of the monitoring system have been installed at locations defined jointly with the user, including the farthest valve connection of one of the branches, in addition to the vacuum tank of the engine room. In this way, many of the benefits of using the system can be demonstrated with the smallest possible investment. Tracking the continuous measurement result can be tracked on a custom-set dashboard with a secure data connection on a computer or mobile phone.

The individual elements of the monitoring system can be aligned, the system is able to send warning and alarm signals even on the basis of relative values. The system automatically generates daily / weekly / monthly reports on the measurement data, which can be exported in xlsx or csv format, depending on the user's needs.

System elements and operation:

- WaterScope IoT data logger with NBIoT network communication
- 2 pressure gauges: 1 valve vacuum, 1 control pressure measurement
- Valve opening detection
- Engine room vacuum measurement
- Measurement cycle time 2 minutes, data transmission cycle time 1 hour
- Built-in battery for at least 3 years
- Two-key network encrypted data transmission
- Dedicated user database on the AWS server
- Generate automatic alarms and reports

FACTS AND DATA

Customer: Regional	Resident population: 4500
Network: 23 km, 430 vacuum valves	Year of construction: 2002
Solution: REDIVAC vacuum system supplemented with wireless smart meters	Year of installation: 2021

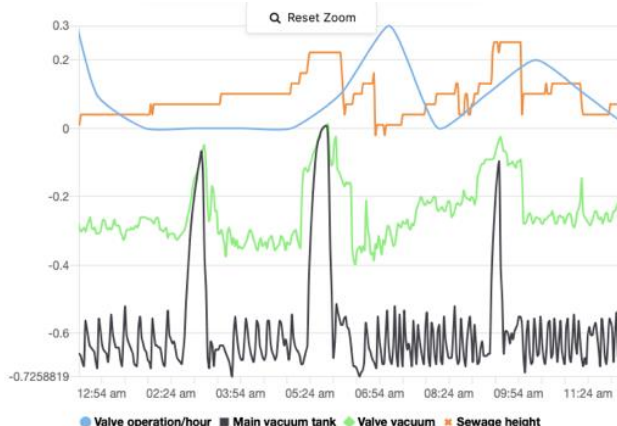


Results

Based on user feedbacks, the WaterScope IoT system provides information to dispatchers and technicians operating the system, as well as to engineers performing operations and cost analysis in several ways:

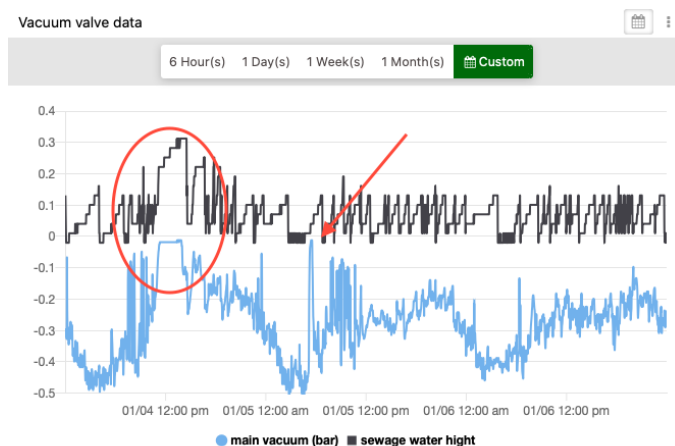
Providing the most important information to **dispatchers**:

- Immediate valve failure indication, location search help with mobile application:
 - o Decreasing downtime
 - o Faster repair
 - o Less unnecessary operation of vacuum pumps
- Valve vacuum monitoring, operational safety
- Detection of network vacuum leaks
 - o Indication of continuous loss that is difficult to detect



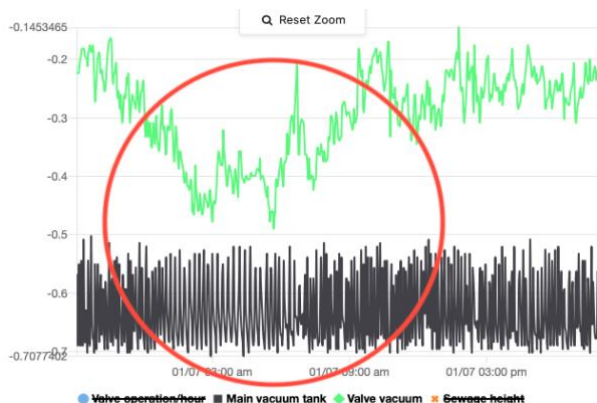
Providing the most important information for **operation**:

- Indication of possible shaft saturation:
 - o A shaft overflow is shown in a circle
- Attention if there is enough vacuum in the system for safe operation
 - o Leaking valve vacuum marked with an arrow



Additional recommendations for possible **reduction of operating costs**:

- Maintain a lower vacuum in the system during night operation
- For example, in the case of a school or industrial zone, there is a possibility of following the demand change between the day and night period.
- Maintain a lower vacuum in the system during night operation



Summary

With the installation of the WaterScope IoT monitoring system on the existing sewage network, both network operators and system engineers have easily obtained new information, which has led to significant reductions in operating costs.

January 2022