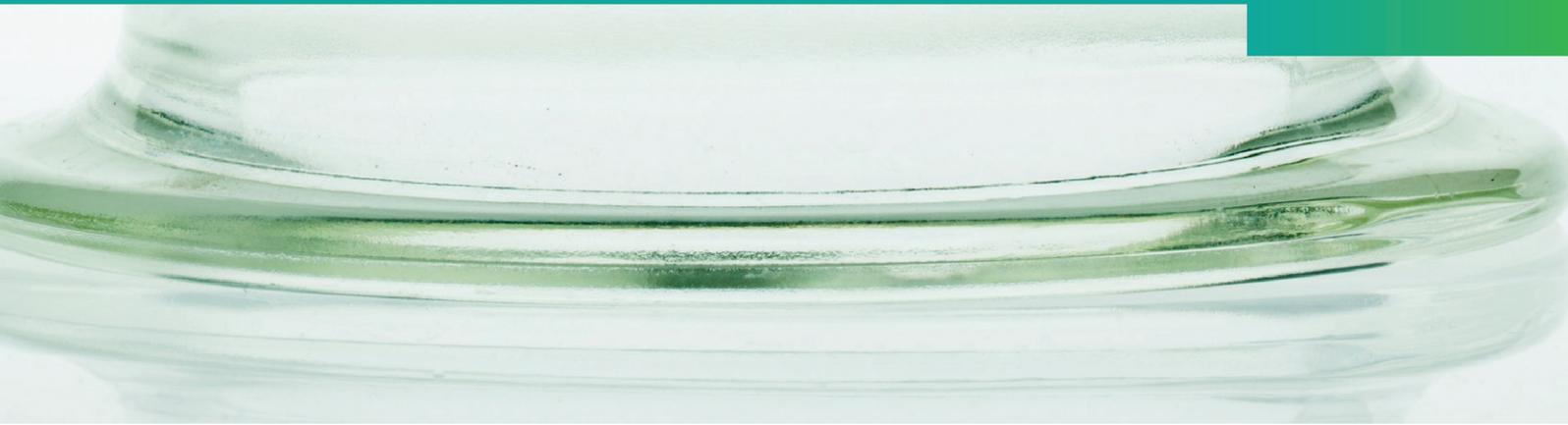


OptiValves from Watershare®



Due to the historical and incremental development of drinking water distribution systems, many distribution networks are quite complex, so that understanding the reliability of the system can be difficult. Valves in drinking water distribution networks are essential to ensure continuity of supply, since they allow for the isolation of incidents, such as pipe breakage, pipe failure or contamination events. The basic function of valves is thus to limit an incident's impact and the risk it presents to the surrounding network. Incorrectly operating valves can therefore have a negative impact for customers. Similarly, poor valve configuration and reliability can aggravate this impact. To illustrate, in the event of a section shut-off requiring seven valves for effective isolation, if each valve has a reliability level of 90%, there is only a 48% chance that the section will be successfully isolated. Naturally, if complete isolation is not achieved, the repair takes more time and an additional section needs to be isolated, with the result that more customers are inconvenienced.

The Watershare® **OptiValves** offers a solution for the optimal maintenance of a water companies' collection of valves. This risk-based approach looks, on the one hand, at the probability of valve failure under different circumstances and how to best assess and improve valve reliability. On the other hand, it examines the effect of valve failure in circumstances where some valves are more critical than others. Together, these elements lead to an optimal valve maintenance programme over the life-cycle of a drinking water distribution network, including an improved inspection procedure per valve and a maintenance programme targeted at the most important valves in the network.

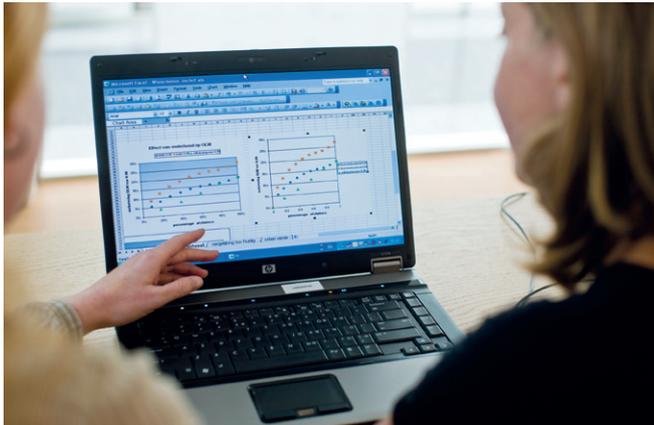
What we can do for you

The **OptiValves** tool consists of a comprehensive manual on how to evaluate and improve the valve inspection and maintenance procedure plus the CAVLAR® software. The manual takes into account the most important local failure mechanisms and helps to determine the best inspection interval. CAVLAR®, in turn, enables one to determine which valves to inspect more frequently. Altogether, this will enhance the network's performance and reduce maintenance costs. It is also possible to consider local pipe failure rates per pipe material and vulnerable customers such as hospitals.

We can assist you in interpreting the **OptiValves** results for a specific situation, as well as in revising the asset management system for your valves. We can also support you in your asset management more generally, and show you how the **OptiValves** results can serve as an example for other infrastructure, such as fire hydrants and drinking water mains.

OptiValves benefits

- A view on how a targeted maintenance programme on valves will enhance the network performance and reduce maintenance cost.
- Better understanding of how valves affect the performance of drinking water distribution systems.
- Improved performance of the most important valves.
- Management support on the operational and tactical level.



Implementation case

KWR has helped the water company Evides to improve its valve inspection procedure. The inspection forms have been adapted and now provide useful information for the overall improvement of valve reliability. Water companies can limit their valve maintenance costs by focussing on the most important failure mechanisms and verify the overall performance with a statistical test.

KWR has used CAVLAR® in several European water distribution networks (e.g., those of Epal in Portugal, and Brabant Water and Waterbedrijf Groningen in the Netherlands) to design targeted valve maintenance schemes. For Waterbedrijf Groningen, the customer-minutes-lost (CML) can be cut by up to 8% using targeted maintenance, compared to only 4% using random maintenance schemes. This new maintenance scheme has reduced therefore considerably the cost of valve maintenance. The improved network performance needs to be assessed over a time frame of some years.

The Watershare® Concept

KWR has launched the Watershare® concept, which is dedicated to the sharing of expert water-related tools with selected partner knowledge institutes. Watershare® encompasses a wide range of benchmarked practical tools designed for areas like water quality and health, sustainability, water technology, asset design and management, and water systems.

Partnering in Watershare® offers the knowledge institute substantial benefits, and contributes significantly to improving the institute's and its end-users' performance and effectiveness. The Watershare® partners become members of a family of trusted and highly reputable institutes, and have the opportunity to build an attractive business model.

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