Spatial Insight
data driven asset management

BestValve

The value of valve actuators

In drinking water distribution valves play a crucial role to isolate sections and to (re)direct the water. Valves are not only used in normal business operation and planned interruption, but also during unplanned interruption of supply. The life cycle management of valves can be optimized by:

- Renewing valves
- Placing additional valves
- Removing valves
- Automating valves
- Increasing or decreasing maintenance intervals
- Or by not doing anything.

Each of the abovementioned interventions aims to:

- Increase reliability
- Minimize effect
- Reduce burst chance
- Reduce time to close
- And/or to reduce costs.

This 2-pager will focus on the value of automating valves, ie. adding an actuator to a manually operated valve.

Spatial Insight

Dutch data science consultancy Spatial Insight is a data science consultancy focusing on the management of underground assets. We combine GIS expertise, with data science and asset management. Our 10 staff team represents a century of experience in the Dutch water sector and holds a strong passion to solve the needs of utilities with data driven solutions. We like to believe Spatial Insight is a leading consultancy on the Dutch home market.

BestValve

German actuator provider 3S-Antriebe GmbH, British agent Smart Actuation Ltd. and Spatial Insight BV identified the following questions on the Western European drinking water market:

- Can we make a tool that will calculate the highest benefit of placing remotely operated actuators?
- Can we relate this decision support to the company's asset management strategy by balancing scores on multiple criteria?

Spatial Insight addressed these questions by creating BestValve, a platform that enables the identification of the valves that have the highest impact on cost, performance and risk in a water distribution network. Following a utility's strategy, for each valve the optimal mitigating action can be determined in an accountable and transparent way.
BestValve

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How it works

Input for BestValve are asset data and failure data of both the valves and pipes in the water distribution network. With multiple 'business rules', some related to costs, some to performance and some to risks, BestValve calculates the 'importance' of each valve in the network. As an example, valves in sections where other sections depend on, will cause high amounts of customers minutes lost when working inadequately.

Secondly, the effect of different scenarios of investments in actuators, on risk reduction and performance increase can be determined objectively and transparently. This will allow water companies to invest optimally and accountably in valve actuators or will support a decision to invest in the replacement of weak pipes instead.

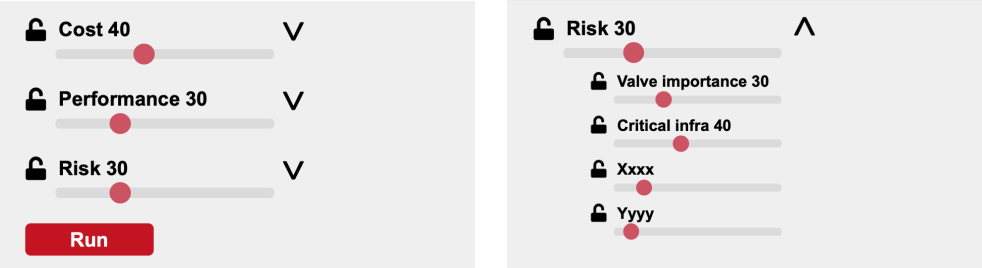

Figure 1. The sliders within BestValve allow tailoring the calculations to the exact utility's strategic asset management goals. The main optimizer is shown (left), and the example of subcategories for 'Risk' (right).

Requirements

Essential for each mathematical model is sufficient data of sufficient quality. We request complete valve data, including the relation (geography, diameter) with connecting pipes. We also need 36 months of failure data (leakages of pipes as well as valve failure data).

Limitation of carbon footprint

Spatial Insight intends to limit the carbon footprint of its operations, and therefore we want to limit our travel movements. We can deliver the majority of our work from distance, and we prefer to work with a local supplier or consultant. We propose only to fly in to build trust, which is hard -if not impossible- to do online.

Next step

We hope and trust BestValve can contribute to the ambitions of your water utility as well. We are pleased to explore how we can define a proof-of-concept (PoC) project.

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