LEAK DETECTION METHOD IMPLEMTENTED IN A REAL-TIME DATA HISTORIAN

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Abstract

Water company Vitens has created a demonstration site called the Vitens Innovation Playground (VIP), in which new technologies and methodologies are developed, tested, and demonstrated. The projects conducted in the demonstration site can be categorized into one of four themes: energy optimization, real-time leak detection, on-line water quality monitoring, and customer interaction. In the real-time leak detection theme, a method for leak detection based on statistical demand forecasting was developed.

Using historical demand patterns and statistical methods - such as median absolute deviation [1], linear regression, sample variance, and exponential moving averages - real-time values can be compared to a predicted demand pattern and checked to be within calculated bandwidths. The method was implemented in Vitens' real-time data historian, continuously comparing measured demand values to be within operational bounds.

One of the advantages of this method is that it doesn't require manual configuration or training sets. In the article, the method and its implementation will be further explained, as well as the company's experience after evaluating the method using live data. Next to leak detection, unmeasured supply between areas and unscheduled plant shutdowns were also detected. More use cases, lessons learned and possible future enhancements will be described in the article. The method was found to be such a success within the company, that it was implemented in an operational dashboard and is now used in day-to-day operations.

Keywords
Real-time, leak detection, demand forecasting, demand patterns, operational dashboard

References

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