

RTC4Water Case Study: Water Distribution Optimization

DOING MORE WITH LESS



**Commune of
Wormeldange,
Luxembourg**

www.wormeldange.lu

"RTC4Water's control system is saving the Commune of Wormeldange time and money every day." Joël Meyers, Industrial Engineer, Wormeldange

Executive Summary

The village of Wormeldange, Luxembourg relies heavily on wine production to support its economy and their commune leaders needed a better way to manage the seasonal demands of water distribution. In 2013 RTC4Water installed the first instance of its Global Predictive Controller™ and our software has continued to help them optimize their network every year. Since installation our partners have reported that it is easier to manage water quality, avoid costly fines and better manage fluctuating demands – especially after experiencing a drought during the summer of 2015 where many communes in the surrounding area had to pay heavy fines when too much water was consumed.

Challenges

For small to medium sized communities, establishing accurate water consumption forecasts can be difficult. This means that most towns or villages will usually over-design their water distribution infrastructure based on estimations about population and industrial growth/consumption rates. Understandably, this lack of precision can lead to problems with water quality (water not moving from basins in a timely manner), inability to meet irregular consumption demands or even inflow (pressure) variances that can lead to leaks. This was the case for the administrators in Wormeldange and they were not satisfied with recommendations to “just build more infrastructure”.



Additionally, due to their country's adoption of the European Water Framework Directive [CEC 2000], their regional water supplier now required that any village that exceeded its daily reserve capacity would pay a large fine.

Our Solution: The Global Predictive Controller™



After performing an analysis of our partner's network, resources and historical consumption data, a customized version of RTC4Water's Global Predictive Controller™ or GPC was installed within their local IT infrastructure. The GPC uses real-time consumption data to create a daily volume set-point and establish a predictive control approach designed to meet all customer-defined operating goals – in this case the automatic regulation of basin inflows depending on consumption and the avoidance of exceeding the daily reserve capacity. As our software does not require continuous monitoring or input from an operator, no additional work was created for the

system engineer. Any changes to the network (maintenance, infrastructure failures, etc.) were automatically detected and automatically adjustments were made. Finally, because of the predictive nature of the mathematical models used by the GPC, the financial risk of exceeding the daily capacity was greatly reduced.

Adopting new technologies and ideas is never easy. The RTC4Water team greatly appreciates all the support and confidence that we have received from the people of Wormeldange.

Results and Return on Investment

Since implementation in 2013, our partners have reported the following:

- Reduction in required daily capacity by 90 m3 (13% annual savings)
- Improved water quality (significantly reduced bacteria levels)
- Reduction of leakage losses (-100 m3 / day)
- No punitive fines from the water supplier even with the reduction in daily capacity (fines are based on volume used and, in this case, we have calculated that their fines would have been between 40.000 and 50.000 Euros)

Our Technology – in simple terms

While we love to discuss model predictive control, mathematical optimization of complex systems and fall back strategies, we understand that our customers just need tools to make their environments run efficiently and without problems. Therefore, we will simply say that our Global Predictive Controller™ (or GPC) is the result of over 10 years of research and development work. The software runs locally at your site and you have full control over its use. Our application runs independently 24 hours a day / 7 days a week and continuously analyzes your network. It uses special algorithms and mathematical optimization to predict future consumption requirements and then adapts automatically to any changes it finds - without the need for operator intervention. The GPC is designed to determine the most efficient use of your existing infrastructure and then provide your SCADA systems with control commands which will maintain an optimal level of performance – without the need for operator surveillance or actions.

RTC₄Water
Real Time Control of Water Infrastructure

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