Case Study for the Water sector
Drinkable water production & distribution

Strasbourg.eu

UCS - Urban Community of Strasbourg, France

When ELUTIONS surfs over the UCS' drinking water network

The water service UCS' mission is to produce and distribute drinking water for 12 of the 28 communes of the Urban Community of Strasbourg (Bischheim, Eckbolsheim, Hoenheim, Ostwald, Lingfield, Oberhausbergen, Ostwald, Reichstett , Schiltigheim, Souffelweyersheim, and Wolfisheim Strasbourg), that is to say 90% of the UCS' population.
The water service is a public service with industrial and commercial view working 7 d/7 and 24 h/24, 365 days a year. Through 1100 kms of pipes, they are 120 000 m³ of drinking water that are distributed daily to 400 000 users.

> Since the establishment of the first Wizcon SCADA system in 1995, UCS's engineers and technicians never had any difficulties to justify the effectiveness and well fondness of this opened supervision system by the various elected!
>
> **Claude Steinmetz**
> **Control engineer technician for Development and parameterization of the supervision system, Urban Community of Strasbourg (UCS)**

Main reservoir with a 2 x 15 000 m³ capacity and pumps from the Polygone factory

The Situation

A complex operation to manage and control
From capture to the pressurization and transportation of raw water, through distribution to various consumers (domestic, agricultural, industrial, fire, street cleaning), the metering for the billing of consumed water, those are multiple data points to be collected and made available, either to drive the system or analyze these information.

It is for this reason that the **Wizcon** application was developed by the **CERIA** Integrator, to automate the production of drinking water able to respond in near real time to changes in consumption over the network. In this operation, maintenance and management of pumping stations and reservoirs, service penalties and emergency repairs are all critical aspects that controlled by the application.

The Presentation

From pumping to distribution of water, a source mastered
The water supplied by the UCS is drawn from the Rhin's ground water from four major pumping stations spread all over the UCS's territory. The main production plant Polygon, which has pumping equipment from 1985, provides 75% of the total water production with 11 wells scattered over the forest's 65 hectares.

These 11 catchments feed two buffer tanks in which 10 pumps draw water for the drive back pressure in the distribution network. This raw water requires no treatment, just a slight chlorination to maintain its quality during its path through the water network.
The drinking water's distribution provided by discharge directly into the network is connected via a 30,000m3 surge tank. This reservoir built in 1985, serves to buffer fluctuations in demand throughout the day. It fills during the night, and gradually empties through the day to feed the network.

Wizcon supervision with centralized management as it is known today was adopted by the Urban Community in 1995 to drive automated production and use, share and facilitate data exchanges between different departments. The establishments of standards and traceability requirements have also led the UCS to gradually modernize its facilities.

The Solution

ControlMaestro by factories pumping rhythm
Production of different sites is managed by three **Wizcon Supervisor** licenses. Both computers run on a redundant system and a third computer mainly manages the site of the Polygon in terms of security (intrusion, equipment rooms, equipment security catchment ...) to separate the different uses. The application is interconnected to the annexes systems (ALERT, etc..) and operation some specific developments.

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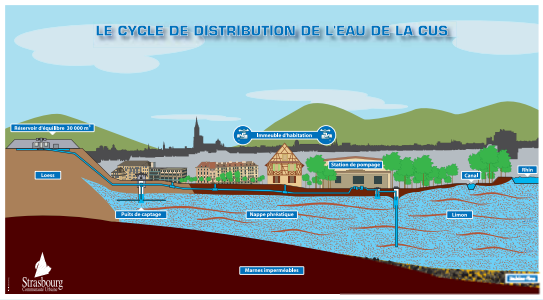


Water distribution cycle of the UCS

In 2010, a new application dedicated to the sectoring was developed under **ControlMaestro**.
The main application, developed as an add-on for **Wizcon Supervisor** manages self-regulation of the pumping system and water storage to ensure continuously, safely, and a flow, sufficient pressure to the consumer devices. The program keeps close to the consumption of electric energy to avoid exceeding peak and manages the pumping and recovery night sea stocks in order to benefit of the best night rates.
With open connectivity to field devices (hardware, sensors, controllers), and via permanent communications links as ADSL / 3G / GPRS between sites, **Wizcon** and **ControlMaestro** know in real time the exact state of the installations (Pressures, flows, faults, alarms etc ...).

Advantages:

Solution benefits
- Production control and data management
- High modularity, scalability

ControlMaestro advantages
- Ease of deployment
- Safety: Dual redundant network and hardware
- Rapid response to specific needs

Return on investment
- Time saving: Rapid integration
- Efficiencies: optimized data communication key
- Reduced maintenance costs

Technical Specifications:

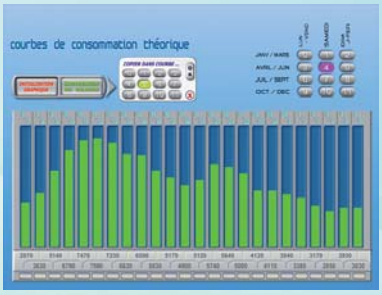
Package
- Wizcon Supervisor, the complete Internet solution for control and information
- ControlMaestro, the new SCADA generation

Architecture
- 2 redundant Wizcon stations
- 1 Wizcon station dedicated to catchments remediation security
- 1 station under ControlMaestro dedicated to zoning

Equipment
- 5 PCs networked Windows
- 14 operators tactile blocks Proface
- 45 S5 + S7 Siemens LAN and ADSL PLCs
- 17 Capturing wells
- 21 pumps

The results and particularities

The principle of automated production is based on a "theorical" knowledge of water consumption, hour by hour over 24 hours. To forecast the demand the system uses a daily consumption model which adjusts depending on the season and type of day (working day, holiday).



HMI allowing self-regulation of the production : theoretical consumption / actual consumption

This demand management enables careful filling and emptying of the buffer tanks which has the positive impact on water quality that doesn't have the time to stagnate (not algae, bacteria...).

The drifts of this process are controlled through a system that monitors and continuously responds to consumption and adjusts automatically, and if necessary, the reference curves which are the basis of the system. The lifetime of the different facilities is improved by preventative maintenance and periodic pump changeover depending on duty cycles with actual duty recorded so service life can be more accurately planned.

Complete production reports are generated daily and sent to the management team and the various departments of Water services.

In 2011, a station that is currently being tested will be connected to the existing network. The construction of a new pumping station is currently underway in the South of the City and should be fully capable of relaying the main site of the Polygone. The new plant will be built with the same architecture as the other four stations and will run on **ControlMaestro**, proving the efficiency, the system performance and the UCS's satisfaction when choosing its supervision since 1995.

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