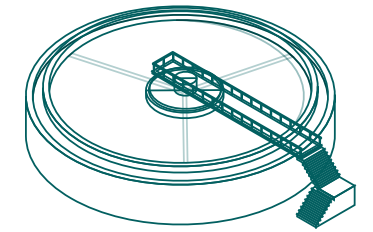




WATER & WASTEWATER SUCCESSES

Global References & Case Studies

GE VERNOVA HAS MORE THAN 3,250 CUSTOMERS IN THE WATER/WASTEWATER INDUSTRY - INCLUDING SOME OF THE LARGEST MUNICIPAL DEPARTMENTS IN THE WORLD.



While we serve water/wastewater departments of all sizes, below is a small sampling of large water utility customers. All customers are using a solution from GE Vernova that includes our HMI/SCADA, Proficy Historian, and IGS. Often, customers are also using other products such as Proficy Webpace.

SABESP

4th largest water and sewage company in the world based on the number of customers. It serves more than 27 million clients in 373 cities in the state of São Paulo, which is the most populated state in Brazil. SABESP is responsible for about 30 percent of the Brazilian investments in sanitation.

Korea Water Resources Corporation

22.3 million people, daily drinking water supply of 17.6 million cubic metres and daily sewage of 12.3 million cubic metres

Mekorot, Israel National Water Company

8 million people including under treaties to the Palestinian Authority and the Kingdom of Jordan, 1.5 billion cubic metres of water annually.

West Coast USA Metropolitan Area

4+ million residents, over 140 billion gallons of drinking water.

Berliner Wasserbetriebe

Supplies over **3.7 million people in Berlin** and surrounding areas with drinking water and treats the wastewater of 3.9 million people. 210 million cubic metres of drinking water.

Toronto Water

3.6 million residents and businesses, treats more than 1 billion litres of drinking water each day.

Dubai Electricity & Water Authority

3.4 million people / 1 million customers, annually 126,000 MIG (Million Imperial Gallons).

East Coast USA Metropolitan Area

3+ million people, dispersed geographical area, more than 185 million gallons per day of drinking water, 300 million gallons per day of sewage.

Singapore Public Utilities Board, National Water Agency

Changi Water Reclamation Plant, one of the world's largest and most advanced reclamation facilities. Treating about half of Singapore's wastewater, **serving approximately 2.85 million people**. 202 million gallons of wastewater per day and expanding to 246 million gallons of wastewater per day in 2022.

Major Australian Region

1.5+ million people, extremely dispersed geography, more than 200 billion litres of water each year.

Northwest USA Metropolitan Area

1.5 million people, 150+ million gallons per day of drinking water at a single water treatment facility

Metropolitan Sewer District of Greater Cincinnati

850,000 people, 160 million gallons of daily wastewater.

SES Water (Surrey, Kent, south London)

735,000 people, 160 million litres of water.

Kommunale Wasserwerke Leipzig GMBH

660,000 people, 37.9 million cubic metres of drinking water and 30.6 million cubic metres of wastewater annually

Malta Water Services Corporation

550,000+ people with drinking water and wastewater collection for the Maltese Islands. 34 million cubic metres of potable water.



TABLE OF CONTENTS

Welcome to the modern HMI/SCADA system—where machines, data, insights, and people are connected. See how GE Vernova customers have improved operator response, adhered to regulations, and reduced costs by implementing proven automation, industrial data management, and analytics solutions—based on decades of water and wastewater experience.



Carmel’s Wastewater Utility Maintains Award-Winning Service

[READ](#)



City of Akron Water Supply Bureau Uses iFIX to Create a Lab Info Management System

[READ](#)



City of Chandler and Carollo: Decreased Time and Labor with Faster, Easier Reporting

[READ](#)



Smooth Sailing at Bloomington/Normal Southeast Wastewater Treatment Plant

[READ](#)



Cincinnati’s “Smart Sewer” Reduces Overflows and Cuts Costs From \$0.23/gallon to \$0.01/gallon

[READ](#)



Bonita Springs Utilities: Going Mobile to Streamline Operations

[READ](#)



City of Hamilton Enables Remote Workers and Supervisors for Seamless 24/7 Operations

[READ](#)



Borås - Water and Sewage: Integrated Operator and Information System

[READ](#)



The City of Haverhill Water and Wastewater Division: Meeting Critical Needs and Maintaining High Quality

[READ](#)



City of New Bedford Increases Water & Wastewater Treatment Reliability with iFIX

[READ](#)



Herning Vand Gathers Valuable Knowledge with Their Historical Data

[READ](#)



Mekorot: High Availability, Connected Control Solution Virtually Eliminates Downtime

[READ](#)



City of Orangetown Lowers Costs and Increases Control Capabilities at Municipal Sewer Department

[READ](#)



iFIX HMI/SCADA and WIN-911 Combine to Babysit Wastewater Treatment at Night in Iowa City

[READ](#)



Middlesex County Improves Operations with HMI/SCADA Mobility

[READ](#)



City of Peoria: Upgraded Alarm Notification Prevents Problems

[READ](#)



Korea Water Resources Corporation Achieves the Highest Efficiency and Quality

[READ](#)



New Kent County Public Utilities Keeps “Ahead of the Game” in SCADA Technology

[READ](#)



City of White Rock’s Investment Brings Dramatic Improvements in Water Quality

[READ](#)



MPGK Krosno Improves Reliability with SCADA and Historian Intelligent City Solution

[READ](#)



Orlando Utilities Commission Creates Powerful, Intuitive Visualizations

[READ](#)



Formellino Wastewater Treatment Improves Purification Process and Achieves 30% Energy Savings

[READ](#)



Malta: SCADA revamp with CIMPLICITY Reduces Waste and Increases Efficiency

[READ](#)



Racibórz Waterworks: Increasing Efficiency and Reducing Risk with Unified Enterprise SCADA

[READ](#)



Rivanna Water & Sewer Authority:
Speeding Performance with Modern,
Thin Client Technology

[READ](#)



Toronto Water Keeps Innovating

[READ](#)



Sabesp Modernizes SCADA Using iFIX and
Remote Desktop Protocol (RDP)

[READ](#)



Vandmiljø Randers: Optimized IT Processes
Management and Power Consumption

[READ](#)



City of San Luis Obispo Improves Efficiency
and Productivity with iFIX

[READ](#)



Region of Waterloo Streamlines Water
System to Ensure Highest Quality

[READ](#)



Sanasa Reduces Maintenance with 24/7
Remote Access to iFIX SCADA System

[READ](#)



Southeast Morris County MUA Optimizes
Water Operations with iFIX HMI/SCADA

[READ](#)



OUTCOMES



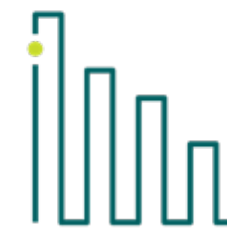
Improving availability and reliability

Aging infrastructures and growing water supply demand make increasing availability and reliability crucial. Our HMI/SCADA, industrial data management, and analytics facilitate the corrective action to remediate a potential problem and ensure the right response.



Minimizing risk

Managing security and risk remains a top concern for utility operators. Our High Performance HMI/SCADA systems alert operators to out-of-spec events with superior alarm management and guides them through the right actions to take — whether routine or in an emergency.



Reducing cost

Operator errors, equipment failures, and excessive maintenance or chemicals all impact bottom line. Our HMI/SCADA allows utility operators to respond appropriately to events, such as storm warnings, and quickly resolve situations—minimizing additional costs.

CITY OF AKRON WATER SUPPLY BUREAU USES iFIX TO CREATE A LAB INFO MANAGEMENT SYSTEM



Key Takeaways and Results

- Leveraging GE Vernova’s iFIX in a water/wastewater facility to create a Lab Info Management System (LIMS)
- Powerful visualizations and metrics
- Monitoring and control of their critical assets
- Increased efficiency

Innovation with HMI/SCADA

The City of Akron Water Supply Bureau in Ohio is proud of how its drinking water quality technicians have used GE Vernova’s iFIX HMI/SCADA to establish and operate a Laboratory Information Management System (LIMS). The system is more efficient and has allowed Akron, a customer of GE Vernova’s partner [GrayMatter](#), to create powerful visualizations and metrics.

Jeff VanNatten from the City of Akron Water Supply Bureau spoke about this unique opportunity. They leverage GE Vernova’s iFIX in their water/wastewater facility for HMI/SCADA and used the software to create a LIM system. The iFIX LIM system sends information into Historian. The City of Akron Water Supply can trend information, trend a bench test with an online analyzer

“It’s something we love promoting. It’s been very beneficial, and it’s pretty revolutionary that it saves us from having a separate LIM system that’s in the cloud and pulling it back and forth. We are proud of it.”

— Jeff VanNatten - City of Akron Water Supply Bureau.

“It’s a great go-to to give us an indication as to how long we have to react and where we need to get the plant back up and running.”

—Jeff VanNatten - City of Akron Water Supply Bureau

or with operational data.

The City of Akron Water Supply monitors the current status at their reservoir locations, along with demand. The team can monitor their reservoirs based off hydraulics, elevations, demand, and more.

Jeff VanNatten explained how GE Vernova’s iFIX has been a great tool.

Any time they perform maintenance or monitor how much they have in their reserve, GE Vernova’s iFIX has been a great “go-to” for the City of Akron Water Supply.

Products

- iFIX HMI/SCADA
- Proficy Historian

About GrayMatter

[GrayMatter’s](#) goal is to transform operations and empower people. Since 1991, we have been helping some of the biggest industrial organizations in the world harness data so they can work smarter. They lean on us to secure their critical systems and connect their industrial assets to their teams so that every operator is empowered to be the best operator. GrayMatter has been on the Inc. 5000 fastest-growing companies list for six consecutive years and has grown to provide Advanced Industrial Analytics, OT Cybersecurity, Digital Transformation and Automation & Control services to clients in CPG, energy, food & beverage, manufacturing and water/wastewater industries across the U.S. and Canada.

WATCH VIDEO





GE VERNOVA

SMOOTH SAILING AT BLOOMINGTON/NORMAL SOUTHEAST WASTEWATER TREATMENT PLANT

This story originally appeared in [*Treatment Plant Operator*](#)
Photography by Bradley Leeb



BLOOMINGTON-NORMAL SOUTHEAST

When the Bloomington-Normal Southeast Wastewater Treatment Plant won a 2018 Plant of the Year award from the Illinois Association of Water Pollution Control Operators, team members were ecstatic.

Randy Stein, executive director and sports fan, likened it to winning the “Stanley Cup of wastewater.” On its way to the award (in Group 1 for plants larger than 7.5 mgd), the plant racked up 12 consecutive Gold Peak Performance Awards from the National Association of Clean Water Agencies.

The Bloomington-Normal Water Reclamation District was formed in 1919 and serves Bloomington, Normal, and the Village of Downs and subdivision of Crestwicke in central Illinois, with a total population of 134,000. The award recognizes safety, permit compliance, operations staff knowledge, and cleanliness and maintenance. A long-standing habit of excellence and effective planning set the plant up for the award.



Caitlin Raasch monitors secondary treatment air flows by way of the plant GE Vernova's SCADA software

CONVENTIONAL ACTIVATED SLUDGE PLANT

The Southeast plant (7.5 mgd design) began operating in June 2005. Jake Callahan, director of operations, describes it as a “conventional activated sludge plant.” Preliminary treatment includes Spiralift screw pumps (Evoqua Water Technologies) and a Waste Tech Model 1300 bar screen with three-eighths-inch separation (Kusters Water, division of Kusters Zima Corp.) followed by a grit trap (Smith & Loveless) and grit washer (Parkson Corp.). The lift stations to the two primary clarifiers use three 125 hp Pentair - Fairbanks Nijhuis pumps. Each clarifier has a Toshiba sludge density meter.

Anoxic tanks are upstream of the five aeration tanks. “They help control the filaments in the activated sludge process,” Callahan says. “We run a higher solids retention time and get good nitrification in winter when the biology slows down. And we don’t observe any settling issues with the biological floc in our secondary clarifiers.” The anoxic tanks have Environmental Dynamics International FlexAir mini-panel fine-bubble diffusers. Blowers are 300 hp Turblex Model KA10SV-GL210 operated with dissolved oxygen control.

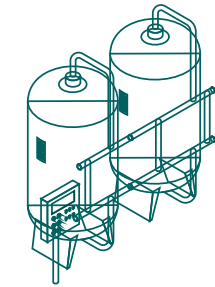
Flow then goes to the two 115-foot-diameter center-feed secondary clarifiers for settling. Tertiary treatment consists of a traveling bridge filtration system. Media is anthracite coal on top, followed by coarse and then fine sand. Final effluent is disinfected by a TrojanUV UV4000 system. “This system has worked well, has been stable and is easy to maintain,” Callahan says. Final effluent is discharged to the Little Kickapoo Creek.



The team at the Bloomington-Normal Southeast Plant includes, from left, Tyler Graf, Randy Stein, Tom Anderson, Matt Mink, Caitlin Raasch and Jake Callahan. The plant is named for Callahan's uncle.

Solids are anaerobically digested to Class B standards, thickened and dewatered. Employees apply the material to farmers’ fields within about 30 miles of the plant. “We haul it and we spread it,” Callahan says. “That way they know where it’s been applied and the application rate is correct. Things are going pretty smoothly.” One reason is the GE Vernova SCADA software interfaced with WIN-911: “A lot of thought was put into our WIN-911 software, which dials out to the on-call operator when there’s a problem.”

The plant also has a unique post-disinfection treatment stage: An experimental constructed wetland removes nutrients from about half of the plant’s discharge. The wetland has hiking trails and bird-watching sites that make it a getaway for area citizens.



Plant managers sent Jon Outlaw, operator, and Tom Anderson, chief mechanic, to run the plant when it started up in 2005. Stein notes that the plant was designed to run with just one operator and two maintenance people. The operator and maintenance person sent to run the plant in 2005 are now nearing retirement. Cum sociis natoque penatibus



Callahan checks the status of the TrojanUV4000Plus (TrojanUV) disinfection system.

CRITICAL TRAINING

In 2019, the district began rotating three of its experienced operators to the Southeast plant two weeks at a time so they could learn the process. Six operators cover the Southeast plant and West plant, the larger of the district's two plants.

The West plant site has two treatment plants that discharge to Sugar Creek. One is a two-stage fixed-film plant with rock filters for BOD removal, nitrifying towers for ammonia removal, deep-bed sand filters and UV disinfection. The other is a conventional activated sludge plant with low-head traveling bridge sand filters, UV disinfection and post-aeration.

The district's operations and maintenance team, in addition to Outlaw and Anderson, includes:

- Josh Stevens, West plant chief operator
- Mason Willis, operations foreman, and wastewater operators Ian Magerl, Caitlin Raasch, Jason Beach, Matt King and Matt Mink
- Brian Romine, solids foreman
- Southeast plant maintenance staff members Brant Ladick and Tyler Graf.



Caitlin Raasch uses a solids meter (YSI, a Xylem brand) to measure mixed liquor suspended solids levels in an aeration basin.

The Southeast plant is a one-operator, five-days-a-week, eight-hours-a-shift gig. It has an advanced SCADA system — GE Vernova — that talks to the West plant via radio telemetry. Operations and maintenance staff are always on call for extreme weather or upsets. The SCADA system can alert the on-call operator when the plant is not staffed, and operators can respond to many alarms via their cellphones without having to report in.

In the first six months of 2019, the district hired three new operators and amped up its training. “We’re trying to get some of the younger staff exposure at the Southeast plant,” Callahan says. “We want them to become familiar with the treatment systems there and have more opportunities to make decisions on their own.” This is where the two-week rotations help.

Coaching them up

The rotations and cross-training also help with communication and information transfer among operators. “Communication and collaboration have been important to our success,” Callahan says. “They’ve taken ownership and strive to find information and work together. With three new operators hired in six months, our senior operators have taken the initiative to coach up new operators.”

“Communication and collaboration have been important to our success.”

— Jake Callahan, Director of Operations

The staff is active in professional organizations. Stevens is past president of the Illinois Association of Water Pollution Control Operators; Magerl is president of the Central Illinois Professional Wastewater Operators organization. Stein and Callahan regularly attend meetings of the Illinois Association of Wastewater Agencies, a manager-level organization.

The district regularly sends operators offsite and even out of state for advanced training. “We encourage taking advantage of educational opportunities,” Stein says. “We send people out all the time, including to the University of Wisconsin-Madison. Their programs typically last four to five days and cover topics of interest to the district. We’re not afraid to spend money on education.”



Matt Mink checks biosolids consistency in the gravity belt filter press (Komline-Sanderson) at the Bloomington-Normal Water Reclamation District Southeast plant site.

NUTRIENT REMOVAL

The Southeast plant was designed with a nutrient-removal-ready footprint. “We expect the Illinois EPA to issue a new permit in August 2020 with a compliance date of 2030,” Callahan says. “Not as much construction will be required at the Southeast plant as at the older West plant to enable it to meet permit; it’s newer and more ready to host new processes.”

One useful new capability is an Orion 420 weather station (Columbia Weather Systems) at the Southeast plant and another at a pump station about 10 miles upstream. These stations record rainfall intensity and duration. The district has integrated real-time weather data into the SCADA system; that helps operators predict impacts on plant operations. Having weather data interfaced between SCADA and lab data software helps in post-event analysis and eliminates hand entry of data.

The staff has also reduced the electric power bill at the Southeast plant. As the local electric utility’s largest customer, the district has worked with utility staff to find a win-win on high-demand summer days when power consumption for air conditioning is high and the electric utility wished the treatment plant would use less power.

The district tied a 2 MW, diesel standby engine-generator (Caterpillar Inc., Electric Power Division) into its SCADA system. When the electric utility tells the district to shed the treatment plant’s electric load for the next four hours, an operator enters the changeover times into the SCADA system.

Rate savings

At the appointed moment, SCADA fires up the generator and performs a closed-transition transfer of demand to it. At the predetermined time to switch back, SCADA returns the power draw back to the electric utility and shuts the generator down.

Using the standby generator for primary power for those four-hour peak demand periods gets the district a substantial electric rate reduction throughout the year. The district had to modify the standby generator to produce lower emissions and comply with air-quality regulations affecting primary power sources.

The district is considering a new blower system for the Southeast plant that will use less horsepower and allow operation with lower dissolved oxygen values. The flow train through the secondary process will also change. “We’re parallel plug flow now, but we’re capable of serpentine flow in series,” Stein says. “We could possibly have a split serpentine flow through five aeration basins.”

There are also plans to nitrify and denitrify in the aeration tanks.

“We’re already investigating the software our SCADA system will require to do this,” Stein says. Some methods that might be used to remove phosphorus at the Southeast plant have been piloted at the West plant.

An innovative measure is in place to control influent at the Southeast plant. Although the plant’s collections system is a separate sanitary sewer system, excessive inflow and infiltration during sustained wet weather has shown the potential to flood the plant grounds.

To prevent that, a 54-inch interceptor lies in a mostly flat grade approaching the plant for temporary influent storage. Flow travels from the three communities about 6 miles to the plant, and there are virtually no connections in the final 3 miles.

With the aid of a highly accurate electrohydraulic actuated sluice gate (REXA) for surge control in the almost-flat interceptor, roughly 1.23 million gallons of influent can be stored there and throttled slowly into the plant. “It works well,” Callahan says.

Stein observes, “When we have a 3-inch rain overnight, I don’t get nervous about flooded pump stations.”

BONITA SPRINGS UTILITIES

Going Mobile to Streamline Operations



GOING MOBILE

A long-time iFIX HMI/SCADA user, Bonita Springs Utilities in Southwest Florida serves one of the fastest-growing regions in one of the nation's fastest-growing states. Its facilities are designed to anticipate a growing population's increasing demand for drinking water and wastewater treatment.

To stay competitive with similar utilities and to maintain its mission to offer "safe, reliable and potable water and wastewater service," Bonita Springs conducted a business process review that noted the utility's manual, paper-based data entry procedures were not as efficient as they could be.

The nature of paper-based entry systems meant that operators would sometimes enter duplicate data or enter it in an inconsistent manner that required additional time and resources to process.

The risk of data entry errors was ever-present, and some data had to be copied from paper and re-entered into a spreadsheet, requiring hours of valuable employee time.

About Bonita Springs Utilities

Bonita Springs Utilities provides water and wastewater service to more than 50,000 people living in a 60-square-mile service

area that covers the City of Bonita Springs, the southern portion of the Village of Estero and unincorporated Lee County.

BSU has a water treatment capacity of up to 12 million gallons per day to allow for continued population growth and serves more than 40,000 wastewater connections.

By the Numbers

- 50,000 service population
- 10 million gallon average daily water production
- 12 million gallon water treatment capacity
- 60 square mile service area
- 40,000 water connections
- 130 employees

Founded in 1969, the member-owned, nonprofit utility employs 130 people and has won numerous honors recognizing it for outstanding water distribution performance, best-tasting drinking water and plant of the year.



BIG WINS



Equip plant operators with smart tablets to streamline inspections



Eliminate inefficiencies related to paperwork



Centralize critical data historian inputs

Solutions

GE Vernova partner GrayMatter is co-innovating with Bonita Springs Utilities to allow plant operators making their daily rounds to input data digitally via a mobile application on a tablet — a first for the utility, which is seeking ways to use technology to improve efficiency and control costs.

The capabilities of the application will expand in response to feedback from BSU's operators.

For example, the mobile application will allow operators to view near real-time iFIX SCADA system data remotely, allowing operators to compare physical gauge readings with their virtual counterparts.

Products

- iFIX HMI/SCADA
- Proficy WebSpace
- Proficy Historian
- Proficy Operations Hub
- Industrial Gateway Server (IGS)
- Proficy Workflow

About GrayMatter

GrayMatter's goal is to transform operations and empower people. Since 1991, we have been helping some of the biggest industrial organizations in the world harness data so they can work smarter. They lean on us to secure their critical systems and connect their industrial assets to their teams so that every operator is empowered to be the best operator. GrayMatter has been on the Inc. 5000 fastest-growing companies list for six consecutive years and has grown to provide Advanced Industrial Analytics, OT Cybersecurity, Digital Transformation and Automation & Control services to clients in CPG, energy, food & beverage, manufacturing and water/wastewater industries across the U.S. and Canada.



BORÅS - WATER AND SEWAGE

New SCADA system for the town



NEW SCADA SYSTEM FOR THE TOWN OF BORÅS

In addition to the water treatment works and sewage treatment works there are 37 pressure step up stations, 16 reservoirs, 97 sewage pumping stations and about 1520km of water and sewage pipes.

It is needless to say that the operation and supervisory of the water and sewage system for an entire town is a complicated task.

We have in total about 100 PLC-systems with a total of 20,000 signals. Novotek has delivered the supervisory system that handles our entire operation, says Lars Jonasson, responsible for the process computer system at Borås W&S.

Continuity and future proofing

The SCADA system installed by ABB many years ago started to create problems.

- The capacity was too low according to Lars Jonasson
- But there was another side too. The system started to get outdated and the number of people that could master it was greatly reduced. We wanted a new system that could preserve old well working functions and at the same time add new technology and be open towards the future

The operators carry on as normal

Novotek took the challenge to bring the configuration from the old system into the new iFIX operator system from GE Vernova.

“At Novotek we have developed an efficient method to treat the old configurations and transfer them from the old system to the new. The accurate migration has among other things meant that it has not been necessary to test each and every signal, a great advantage,” says Magnus Linnér who was responsible for the architecture at Novotek.

All information present in the plant was migrated into a new error free configuration. At the same time the old base for the communication with all the control systems was replaced with a modern and easy to maintain Ethernet based communication.

The new process pictures and operator screens are very similar to the old ones. This means that the operators can work in a similar manner as they used to. All operators in the different plants can see each other's plants. They have also been able to trust the information in the pictures all from the start.



The water supply in Borås is safe guarded with a new SCADA system from Novotek.

The town of Borås has a population of 100,000 people. Drinking water is produced in 8 water treatment plants that produces 8.8 million cubic meters of water every year. Nine sewage treatment works takes care of 15 million cubic meters of sewage water per year.

Solutions

- Operator and SCADA system
- Alarm distribution
- Logging of historian data
- Environmental reporting
- Remote diagnostics

Products

- 2 iFIX SCADA servers
- 2 iFIX main work stations with double screens
- 2 iClient Terminal servers for up to 20 simultaneous logged in users
- New network

Advantages

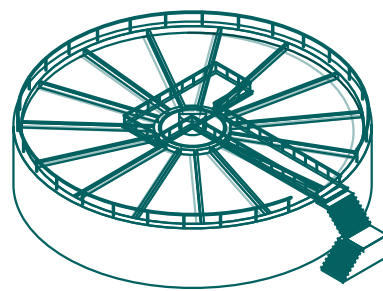
- An integrated operator and information system
- Fast to learn
- Environmental reporting according to legal requirements
- Standard communication over Ethernet, easy to maintain
- Increased capacity and expansion possibilities
- Open system that gives flexibility when choosing supplier
- One of the world's largest SCADA system suppliers means future proof

AN EXTENSION PROJECT WITH A CONTINUATION

The new system handles a great number of different functions. It consists of the SCADA and HMI system iFIX and Proficy Historian for archiving of signals. The system handles all start and stop of equipment, all control loops, alarm distribution via text messages to mobiles, remote diagnostics from all connected PCs, reporting of environmental data to the authorities, logging of trends, own analysis in Excel, etc. The personnel have become more flexible since they now can log in via Internet and web-interface where ever they are. They can see the same operator screens if they are at home on call or if they are at work.

“Novotek got the assignment since they were able to show us how they could migrate data in a secure way from the old system and because they could provide us with an open and future proof solution,” says Lars Jonasson.

“We can now maintain the system much on our own. If we have an emergency we can always contact Novotek who provides us with a 24/7 service agreement. Usually if there is a problem or there is something we want to have done this can be done over an Internet VPN-connection.”



Borås W&S worked out a future proof solution that preserves past experience and combines it with new technology.

WIN-911 AND IFIX HELP CARMEL'S WASTEWATER UTILITY MAINTAIN AWARD-WINNING SERVICE



- 50% Faster response
- No code configuration - Plug-and-play integration
- High reliability - SCADA and alarm management

INTRODUCTION

Municipality

City of Carmel, Indiana

Products

- iFIX HMI/SCADA
- WIN-911

Sewage treatment that's best in class at Carmel, Indiana: One of America's top 10 places to live

You may have heard of Carmel, California, the seaside resort where Clint Eastwood once was mayor. But there's another Carmel in Indiana that's recently been attracting attention. For two years running, this growing city of 90,000 has made Money Magazine's 10 Best Places to Live in America.

What's behind the accolades? Besides a picturesque downtown, a thriving economy, and being America's roundabout capital (there's over 100), Carmel is a leader in wastewater treatment. It goes back to when the city won an Engineering Excellence Award for being the first in the US to implement a Bio-Pasteur process for its biosolids.

Today that innovation continues with the city's ongoing drive to optimize its water and wastewater processes, including implementing iFIX HMI/SCADA with WIN-911's software for remote alarm notifications.

Challenge

Modernizing the plant's control and communication systems

Previously, the city's water department used an aging dial-out system with paging and analog voice calls to alert staff when its 12MGD wastewater plant equipment or one of 22 lift stations would go into alarm mode. That changed when they upgraded to GE Vernova's iFIX SCADA system along with WIN-911 for in-app and SMS alerts.

The team uses iFIX for monitoring and control, sending alarm events to WIN-911 on:

- Lift station levels
- Blower & pump failures
- Phase power failures
- Flow and pressure meters
- Chemical meters, clarifiers, aeration feed rates and levels
- Communication failures



“WIN-911’s main benefits are its flexible scheduling, its multiple ways of sending alarms, and its ability to group alarms for both in-plant and out-of-plant alarms.”

— **Kevin Buhmann - Senior Wastewater Technician,**
City of Carmel, IN

The utilities department currently operates two manned shifts on weekdays, and one on weekends, with the late-night hours being unmanned. In-plant alarms are routed to plant staff, lift station alarms go to lift station personnel, and a hodgepodge of miscellaneous alarms need to go out to a range of different people, depending on the alarm type and severity.

Buhmann says that WIN-911’s flexible scheduling and escalation engine was a key to relieving overlap and confusion when it came to alarm response. “It works great for grouping alarms for both in-plant and off-site staff, and accommodating our changing shifts and schedules.”

Results

Alarm response has improved

Buhmann notes that the new system saves time and money because of improved efficiency in response, both during and after regular work hours.

Our response time has improved because we can let people know specifically what the alarm is and in what status condition. No one has to go to our monitoring computers to see the alarms and where they are at.

— **Kevin Buhmann - Senior Wastewater Technician,**
City of Carmel, IN

As one of the people responsible for installing new IT systems and PLC programming, Buhmann knows how complexity in implementing automation projects can be a show-stopper. He pointed to WIN-911’s direct connects to iFIX as a major advantage. “It’s (plug and play configuration) works great ... and is easy to set up.”



CITY OF CHANDLER, ARIZONA, AND CAROLLO

Decreased time and labor with faster, easier reporting



CITY OF CHANDLER, ARIZONA, AND CAROLLO

Challenge

Time- and labor-intensive reporting – requiring a specialized skillset, not always available. Detailed documentation and reports for EPA compliance and internal reviews. Long-term document management. Needed out-of-the box solution that would interface with existing automation.

Action

Implemented Dream Report with GE Vernova's CIMPLICITY HMI/SCADA for easy setup of report templates for EPA compliance and internal reviews. One-button web portal setup.

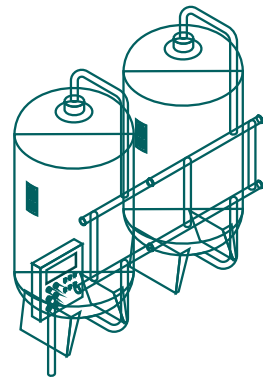
Result

- Faster, easier reporting – saving time and labor
- New reports created in minutes versus days
- Short learning curve with fast technical support
- Anywhere, anytime access – even from smart phones – for improved collaboration and decision making



METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

The Metropolitan Sewer District of Greater Cincinnati (known as MSD) protects public health and the environment through the safe and efficient collection and treatment of wastewater for 43 of the 49 political subdivisions in Hamilton County, Ohio, and small parts of Butler, Clermont, and Warren counties.



MSD's service area encompasses 290+ square miles and serves a population of more than 850,000. MSD maintains about 3,000 miles of sanitary and combined sewers and operates seven major waste water treatment plants, more than 100 pump stations, two package treatment plants and several high-rate treatment facilities. About 160 million gallons of wastewater is treated daily.

Challenges

Compliance with federal mandate

Increase existing sewer system efficiency to address Consent Decree (federal mandate) to keep raw sewage mixed with stormwater out of waterways when it rains.

Solutions

A wet weather operational program for monitoring and control

Using iFIX HMI/SCADA and Proficy Historian from GE Vernova® in a Wet Weather Operational Optimization system, Greater Cincinnati MSD monitors flow levels and controlling gates and valves to direct flows, allowing the utility to store flows inside large interceptor sewers, storage tanks, and high-rate treatment facilities in different parts of the sewer system. The software also delivers the visibility for operators to make informed decisions and optimize the use of the interceptors, avoiding overflowing systems that are at capacity.

Results

“Smart Sewer” optimizes operations

- Reduced costs to about \$0.01/gallon of overflow volume, as compared to about \$0.23/gallon for green stormwater controls and about \$0.40/gallon for larger pipes and storage tanks
- Reduced sewer overflows by more than 400 million gallons per year
- Decreased new capital projects needed to reduce the overflows, such as larger sewers and storage tanks
- Anticipated to save tens of millions of dollars in capital investments in projects to control sewer overflows



CITY OF HAMILTON ENABLES REMOTE WORKERS AND SUPERVISORS FOR SEAMLESS 24/7 OPERATIONS



Connecting Remote Operators

Canadian utility connects at-home operators to plant operations

The City of Hamilton in Ontario quickly enabled water/wastewater plant operators to work from home within four days of a decision to implement social distancing protocols to slow the spread of COVID-19.

Partnerships with GE representative [GrayMatter](#) and GE Vernova allowed them to move quickly to use no-cost remote licenses.

Remote Viewing vs Remote Operations

City of Hamilton has been a long-time iFIX HMI/SCADA user, working with GrayMatter and GE Vernova's automation software for 20 years.

While the team had technology in place to view operations remotely through iFIX, they did not have technology in place for remote control.

"We didn't have a means of working remotely on the system," explained Geoff Botha, SCADA Superintendent, City of Hamilton. "We had the ability to view remotely through a normal terminal server, but that would just be to see the status of operations but not to do any control. Hamilton's system is set up so that we have a manned control room 365 days a year, 24 hours a day with personnel in the control room operating the system."

COVID & Enabling Remote Operations

At the beginning of the COVID pandemic, Botha reached out to GrayMatter, who partnered with GE Vernova to quickly put in place a special COVID-response program for free remote operations licenses – and what started with a need from

"It's a team, and everybody stepped up to the plate."

—Geoff Botha - SCADA Superintendent, City of Hamilton

the City of Hamilton helped other industrial organizations around the world.

According to Botha, it was all hands on-deck to get Hamilton enabled quickly for remote operations. The team built iFIX View nodes, worked with their cloud provider, and delivered the remote operations nodes to operators and supervisors homes, maintaining social distancing.

From the time of the initial inquiry and exploration, to the decision being made, to remote operations in place was only 10 days.

Telecommuting in an OT Environment

Operators have provided feedback that they like the remote operations solution.

"It's a morale boost that they can work safely, that they can work [during the pandemic] and work efficiently," Botha noted.

"It has really proved that telecommuting in an OT environment is possible. For the SCADA staff, it didn't take them long to come up and be fully operational. We've been able to carry on full.

"We've just had a 15-day FAT on the system, and it was very achievable, and it also means that the number of people that we would have had to travel was reduced. We were able to accomplish more smoothly a large-scale FAT using the system as we've deployed it."

Beyond the pandemic, Hamilton sees the remote operations ability helping in other ways. For example, remote operations are critical during large storm events, enabling workers to reach out to staff remotely and be able to support the operations during stressful and emergency times.



WATCH VIDEO

Beyond the pandemic, Hamilton sees the remote operations ability helping in other ways. For example, remote operations are critical during large storm events, enabling workers to reach out to staff remotely and be able to support the operations during stressful and emergency times.

“Most operations are able to be carried out remotely, with the exception of needing to send an operator or maintenance technician in the field to check a piece of equipment. In the plant, there are still daily checks and sampling to be done, but the system does reduce the amount of staff that you have to have in-person in an operating area,” Botha explains.

Everyone in a control role can work remotely, according to Botha. Also, senior leadership can view the system remotely and have collaborative conversations cross-functionally while remote.

Products

- iFIX
- Proficy Historian

About GrayMatter

[GrayMatter's](#) goal is to transform operations and empower people. Since 1991, we have been helping some of the biggest industrial organizations in the world harness data so they can work smarter. They lean on us to secure their critical systems and connect their industrial assets to their teams so that every operator is empowered to be the best operator. GrayMatter has been on the Inc. 5000 fastest-growing companies list for six consecutive years and has grown to provide Advanced Industrial Analytics, OT Cybersecurity, Digital Transformation and Automation & Control services to clients in CPG, energy, food & beverage, manufacturing and water/wastewater industries across the U.S. and Canada.



THE CITY OF HAVERHILL WATER AND WASTEWATER DIVISION

Meeting critical needs and maintaining high quality



THE CITY OF HAVERHILL, MASSACHUSETTS, KEEPS A CLOSE WATCH ON ITS WATER INFRASTRUCTURE, OPERATING BOTH WATER AND WASTEWATER DIVISIONS.

The city's Water Division provides drinking water to 58,000 Haverhill residents and businesses, and produces two billion gallons of water on average each year. The plant itself is manned 24 hours a day, seven days a week, to ensure the highest quality water is delivered each day to the city's residents. Water quality is constantly monitored to make sure that it meets both state and federal drinking water quality standards at all times. Water treatment processes include conventional surface water treatments such as coagulation, flocculation, sedimentation, filtration, disinfection, and pumping.

The city's Wastewater Division maintains the wastewater treatment plant, which provides both primary and secondary treatment for the city's wastewater. Within the Wastewater Division there are two groups—one monitoring wastewater collection, and the other overseeing wastewater

treatment, which includes bringing water and routing wastewater into various facilities from multiple points across the city.

As part of its duty to safeguard the city's water supply, the Water Division is also responsible for monitoring, water maintenance, and water treatment, which includes protecting water resources. The city of Haverhill is currently supplied with water from Kenoza Lake, Millvale Reservoir, Round Pond, and Crystal Lake.

The facilities themselves are 32-years-old, however, the control strategies they have in place today have put them well ahead of other facilities of similar size and operation—thanks in large part to tools becoming more readily available, accessible, and connected.

Benefits of working with GE Vernova

- GE Vernova has put the city of Haverhill's Water and Wastewater Divisions well ahead of other facilities of similar size and operation
- They now have the ability to use advanced analytics to model high-flow scenarios—and better prepare the plant for potential weather-related issues
- Plant's knowledge base was captured, reducing training overhead



John D'Aoust, Plant Manager for the city of Haverhill's Water Division, has been with the city for 18 years, and has been leading the charge to harness the power of the Industrial Internet. He began many years ago by teaming with GE Vernova to automate many of the processes that his team had manually documented in order to follow standard operating procedures (SOPs), including state-mandated emergency response plans (ERPs).

D'Aoust's first step was to implement GE Vernova's iFIX. It quickly became a real asset in maintaining water quality. Next, the Haverhill team added GE Vernova's Workflow, a software platform for measuring and managing the efficiency of plant operations. It was an immense performance improvement over their documented processes. Moving to a computerized process environment allowed D'Aoust and his team to have a cohesive system to follow procedures, and respond to events in a consistent and sequenced manner.

He took his connected environment even further, and purchased Dell Latitude laptops for his on-call operators. Allowing them to be untethered from the facility, but still access GE Vernova's software to maintain control of operations from any location. The on-call people are the first responders for after-hour issues—maintaining pumps, monitoring chemical levels in the treatment plant, and even keeping a watchful eye on the plant itself as the post-911 era raised awareness for new safety concerns.

“With GE Vernova's iFIX you can dial in the plant—get it set up and you don't have to watch it as closely. It was all manually controlled before—all hardware based, and it took a lot of attention by the team to maintain,” he said.

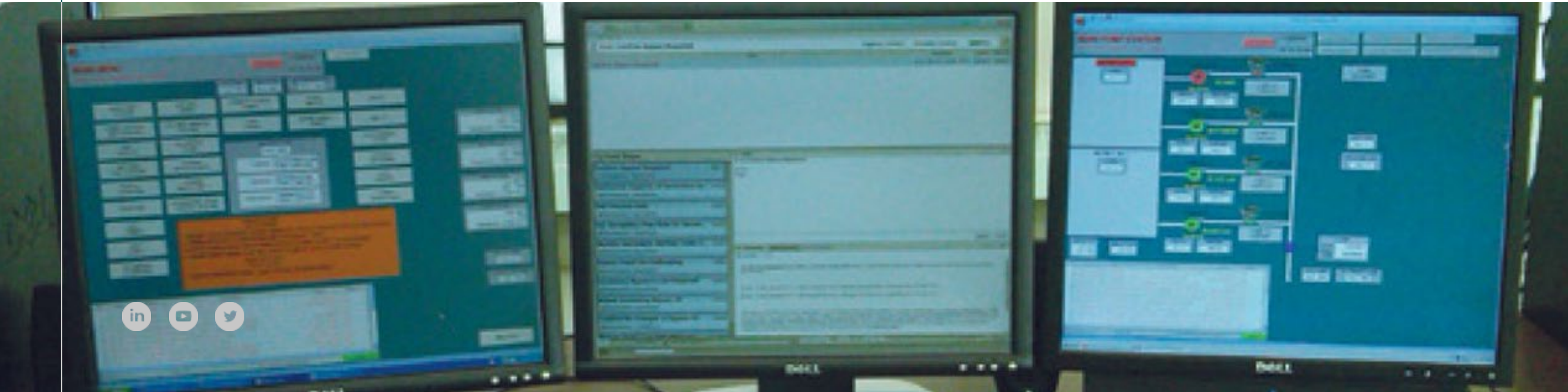
The laptops were equipped with GE Vernova's software and cellular dongles to access water facility operations. Each laptop had to be maintained and manually updated. The benefits of being remote and still being able to access iFIX were clearly visible. So much so that D'Aoust put GE Vernova's mobile app to work and swapped out his pool of laptops for a single

Apple iPad connected over wireless LTE. The plant's team is alerted to any issue through a series of alarms that have been established, and they can use related products, such as troubleshooter programs to conduct flow chart decision-making for their wastewater operations.

“They have all the features of the control room in their hands.”

“With GE Vernova's iFIX you can dial in the plant—get it set up and you don't have to watch it as closely. It was all manually controlled before—all hardware based, and it took a lot of attention by the team to maintain.”

**— John D'Aoust, Plant Manager
for the city of Haverhill's Water Division**



According to John D'Aoust, "The upside of moving from three laptops to an iPad is that there's only one machine to maintain, and the price per iPad is considerably less than having to purchase multiple laptops. There's a time savings, and it lowers the complexity of our system."

The one technical hurdle that he had to overcome in his move to become more mobile was to ensure the security of the network. In order to get the iPad onto their internal network, they had to reevaluate their VPN connection. Ultimately that involved a change of provider.

One of the unanticipated benefits of this newly-connected world was the ability to capture and transfer knowledge easily between senior members of this staff and new hires. "One of the biggest project benefits of putting the data model together has been capturing our knowledge base," said Fred Haffty, Wastewater Facility Manager. "We have people who have been here since the plant started more than 30 years ago, and when they retire, they take that experience with them. So when new operators come in, they are able to know how the system works—to be able to adjust the treatment process for swings without impacting quality."

The move from a manually-intensive operation to a much more efficient software-based mobile operation has afforded the plant with much more flexibility, and resulted in cost savings. The team is able to see everything that's happening at the plant from a remote location, and be alerted to changes in the water operations without a strain on human capital.

Just recently, the team started using advanced analytics to model data for high flow situations—such as potential threats brought about by severe weather. Using GE Vernova's Troubleshooter, a powerful analytical tool that utilizes leading-edge techniques to extract knowledge from historical processes and plant data, the team is able to get a real sense of how the plant will perform under certain conditions.

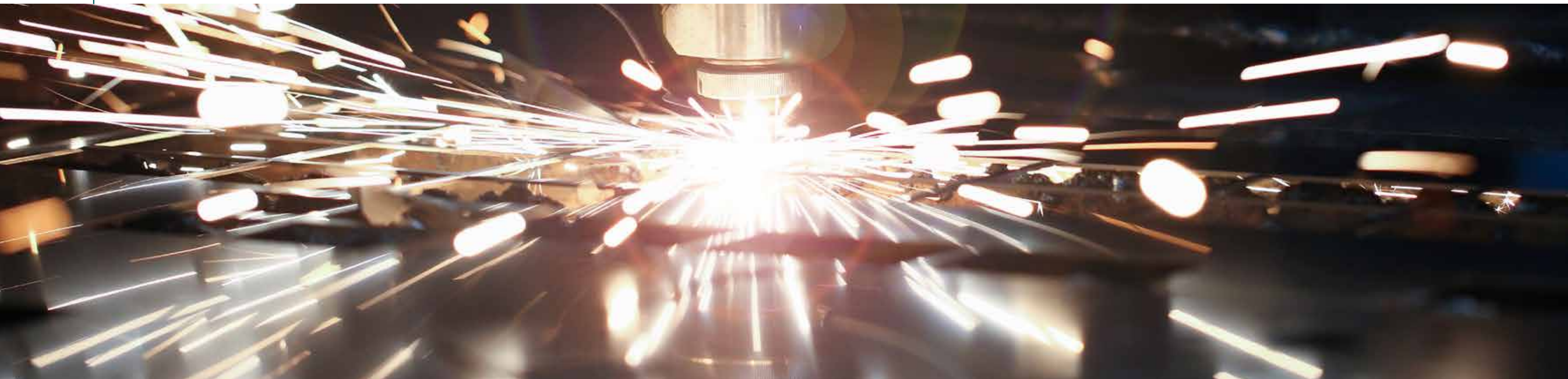
For example, if the plant exceeded X-number of gallons a day, what is the likely result? Previously, the team had to refer back to historical data that was fixed and not fluid. Information was logged into an Excel spreadsheet—it was a very manual process with no modeling capability. Now they have five key performance indicators to monitor operational performance much more effectively. GE Vernova's Troubleshooter can have a fundamental impact on present time.

It's been 12 years since John began working with GE Vernova to transform the city of Haverhill's water operations from a fixed hardware-based manual operation to one that's leading-edge in his industry. His experience continues to be a positive one.

"We've been working with [GE Vernova] for the past 12 years now, and it's been a great relationship," said John D'Aoust. "We've made those 2 a.m. calls to our reps, and they've been right there to answer—whatever we've needed. Our philosophy is that you pick a good company up front to meet your needs, and you stick with them. We haven't been disappointed."



CITY OF NEW BEDFORD INCREASES WATER & WASTEWATER TREATMENT RELIABILITY WITH iFIX



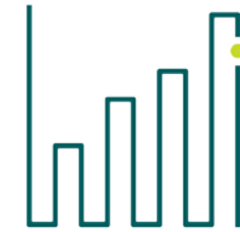
SCADA UPGRADE TO MODERNIZE OPERATIONS

The City of New Bedford Water and Wastewater Treatment Divisions includes the fifth largest wastewater facility in Massachusetts. Their water treatment plant was built in the early 1970s, and the wastewater facility was built in the early 1990s. With outdated technology, the city needed to upgrade and modernize the water and wastewater treatment plants' control and communications systems. They decided to upgrade their entire SCADA system with GE Vernova's iFIX HMI/SCADA for monitoring and control.

[WATCH VIDEO](#)

The team at the City of New Bedford worked with GE Vernova and trusted partner, AutomaTech, for the full deployment of the iFIX HMI/SCADA system from design to implementation. An important step they took was to include the operators of the City of New Bedford Water and Wastewater in the design process, so when it came time to go live, they had the tools and knowledge they needed for a seamless transition.

“The reliability is certainly there and the speed at which we can change things too. The way it’s set up now, there’s more interfaces throughout the facility that the operators can go in and make changes to the process as they’re working. The reliability of the system, the ease of operation, and ease of maintenance of the system are paramount,” said James Ricci, Superintendent of Water, City of New Bedford. “The sophistication of the system, being able to bring in all the control points, and make it work, obviously needed talented people with expertise to do that.”



“There is a lot of flexibility, a lot more reliability and ease of going to a company like GE for the support including technical support, and hardware they provide. It is where we want to be 20 years from now.”

— **James Ricci - Superintendent of Water,**
City of New Bedford



Products

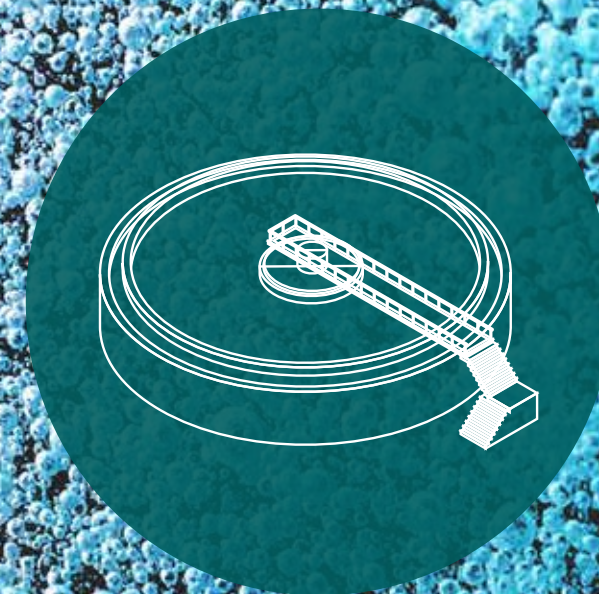
- iFIX
- Proficy Historian

Results

- Higher reliability with SCADA system upgrade to monitor and control facilities
- Ease of operations and maintenance
- Better time to insight
- Increased efficiency
- Collect data for analysis
- Reduced risk

About AutomaTech

[AutomaTech](#) is a leading provider of industrial technology solutions focused on improving your operational performance. By harnessing the power of data, we enable significant gains, visibility across your entire organization, and increased profits for a competitive edge. Our product offering includes a flexible and scalable mix of hardware and software solutions to solve your toughest challenges while providing a roadmap for future improvements and growth.



CITY OF ORANGETOWN

GE solution lowers costs, increases control capabilities at municipal sewer department



GETTING RID OF WASTE

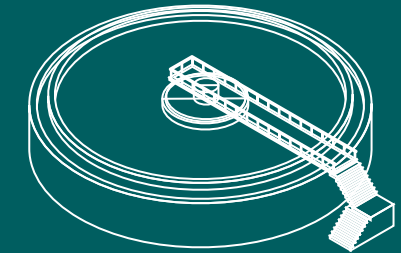
Running, maintaining, and upgrading a sewer system is challenging enough when a municipality has the luxury of unlimited funding for such projects. However, when funding is tight and a manufacturer no longer supports the existing control equipment or can provide a reasonably priced alternative, the job is that much harder.

The Orangetown Department of Environmental Management & Engineering, which is responsible for the sewer system that serves about 50,000 people in New York's southern Hudson River Valley, faced this problem. Orangetown's existing system was comprised of 41 remote sewage pump stations, only 11 of which it could afford to network via radio telemetry. After receiving a grant from the State of New York to upgrade the controls and connect all 41 stations, the municipality discovered that the supplier of its existing control and telemetry equipment no longer supported it, and the only alternatives from that company were much too expensive for Orangetown's budget. Robert J. Beckerle, Director of the Orangetown Department of Environmental Management & Engineering, sought a reasonably priced solution with more robust capabilities that would integrate with the company's LAN and that would be supported by the manufacturer throughout its lifetime. GE Vernova's CIMPLICITY HMI/SCADA and Emerson's VersaMax PLC, integrated into the plant by Optimum Controls Corporation (OCC) of Reading, PA, emerged as the clear choice.



“The GE CIMPLICITY solution gives us more complete information at a better price than our previous control system.”

**— Robert J. Beckerle Director
Orangetown Department of Environmental
Management & Engineering**



Results

- Cost-effective controls upgrade
- Zero downtime
- Easy installation and maintenance
- Greater data availability and documentation
- Scalable solution accommodates three differently sized pumping stations
- Highly reliable
- Outstanding service and support
- Integration with existing operating system

BRINGING CIMPPLICITY TO A COMPLEX PROJECT

With pump stations that run the gamut from small and simple (20 hp submersibles on float balls) to large and sophisticated (1000 hp {4,250 Hp pumps} with VFDs and ultra sonic level controls), Orangetown can accommodate a tremendous range of applications.

However, for continuity and ease of maintenance, each of Orangetown's 41 remote sewage pump stations are configured in a similar manner. Each station's control logic and cabinet are designed in one of three ways, which vary greatly in size to accommodate the diversity of applications. One features two pumps with float controls, another incorporates three pumps with float controls, and the final is comprised of three pumps that receive analog signals from ultrasonic indicators. The pumps are controlled through variable speed AC frequency drives that match the pump speed to the inflow. The common component in each configuration is a VersaMax PLC, which monitors and controls such performance indicators as alarms, wet well levels, pump speed/inflow, and status points.

The PLC at each station transmits pump data via a wireless network to a CIMPPLICITY SCADA system in the plant. Information received through the system is distributed to four stations through an internal LAN. One station features a CIMPPLICITY server that provides the status of each pumping station and alarming functions. The other three stations are clients that enable plant personnel to monitor the pumping stations from their desks.

A Clean Performance

With the exception of a few pump stations that have not yet been incorporated into the network, the new control system is fully operational, and Beckerle has been pleased with its performance.

"We receive more complete information about each pumping station at a better price than we did with our previous solution," he says. "And the system has been very reliable—we have experienced zero downtime since installing this equipment."

The installation itself, according to Beckerle and Terry Campbell of OCC, was relatively easy, and the equipment is user-friendly.

But good technology doesn't sell itself. Beckerle was very impressed with the knowledge and expertise of his GE representative, who explained, among other things, how Beckerle could upgrade from his existing software and hardware configuration to this new GE solution through a cost-effective upgrade program.

The next step that Orangetown Department of Environmental Management & Engineering is taking to further upgrade its pump station automation is the addition of a CIMPPLICITY mobile notification system, which notifies a user when an alarm situation occurs, allowing faster response time.

With all of these features, the new system is paying off for Orangetown. The upgrade was cost effective, and the system has experienced zero downtime. Easy installation and maintenance have added to its benefits. At Orangetown, it looks like the grant from the state has been used well—without any "waste."





GE VERNOVA

CITY OF PEORIA: UPGRADED ALARM NOTIFICATION PREVENTS PROBLEMS

Peoria, AZ., learns first hand how software reduces response time and mitigates service disruptions



PEORIA, ARIZONA

Founded in 1886 and incorporated in 1954, this desert city sits in the Salt River Valley and extends into the foothills of the mountains. As a major suburb of Phoenix and the sixth-largest city in Arizona, residents and visitors enjoy a wide-variety of activities, including serving as Spring Training home to the San Diego Padres and Seattle Mariners. The city also boasts 34 neighborhood parks, three public pools, two large community parks, five dog parks, and more than 26 miles of mountain and multi-use trails.

Water Infrastructure

Ensuring safe, clean water for residents, businesses and visitors is critical to the city's utilities department, which provides water, wastewater, and solid waste services to almost 60,000 residences and businesses. This includes two water treatment and four wastewater plants, over 70 wells, substations and PRVS at remote sites.

Alarm Notification

Remote monitoring software allows fewer people to monitor many more assets using devices that people already have, such as smartphones and tablets. Uninterrupted remote availability is essential to ensuring that systems can be continuously monitored.

The city knew that an automated alarm notification system would help them effectively monitor the plants, wells and equipment, and to respond quickly to any emergencies. After thoroughly reviewing numerous options, the City of Peoria invested in WIN-911, a software alarm notification system running on the GE Vernova's iFIX SCADA platform. These systems allow monitoring of all pertinent equipment and water quality parameters with room for expansion.

Business Systems Analyst Ron Schmidt recently joined the City of Peoria Water Department SCADA Group and oversees the water department's IT. Peoria's SCADA Group provides the system to run the water and wastewater collection sites, which includes chemical treatment, flow controls, well site monitoring and basic water production monitoring.

"WIN-911 ensures that our team doesn't have to devote time to alarm screening. We receive notification that lets us know when equipment isn't working and then a technician is sent to verify and fix the situation," commented Schmidt.

"The GE Vernova iFIX and WIN-911 Interactive platforms expedite alarm changes, save time and mitigate the potential disruption of service"

**— Ron Schmidt, Business Systems Analyst,
City of Peoria Water Department SCADA Group**



Aeration Basin Flow Control Gate controls the pressure and flow of air for treatment ponds and promotes biochemical oxidation of wastewaters.



Grit Chamber, grit pump and grit seal water pump: *The grit chamber primary catches inorganic solids such as sand, gravel, glass, corn, and soil.*

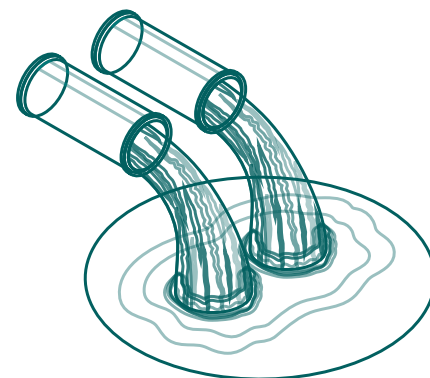
UPGRADE PREVENTS PROBLEMS

Schmidt has been involved with a software upgrade of the latest release, WIN-911 Interactive, to push critical plant alarm and event details to remote workers via SMS Text Message. The upgraded software seamlessly integrates with the GE Vernova's iFIX SCADA platform while improving safety, reducing worker response times and quickly delivering information.

Two recent incidents have proven the value of the alarm notification software. An inlet water pumping station lost power and while the backup generator started, it quickly shut down, too. The team received notification about the initial power loss and received notification of the subsequent generator failure via WIN-911. These alarm notifications allowed Schmidt and his team to know about the power losses before an overflow occurred or untreated sewage became a problem. They were able to respond quicker and send the right people.

WIN-911 also alerted the team about another incident involving a power outage to a critical site that brings eight different wells into a reservoir. The alarm indicated there was a loss of communication. The team was able to respond within seconds of receiving the alarm and resolve the issue within one hour.

"The GE Vernova's iFIX and WIN-911 Interactive platforms expedite alarm changes, save time and mitigate the potential disruption of service," Schmidt added.



Influent Pump Control Cabinets: Exterior monitoring control cabinets for the influent pump station where wastewater from the city's collection system enters the processing plant and is pumped to the beginning of the treatment process.



Aeration Basin Air Header: The City of Peoria's Aeration Basin Air Header ensures the wastewater treatment system maintains and aerobic condition and improves the water quality for subsequent usage. This process helps get rid of bad bacteria before water is percolated into the ground water system.



GE VERNOVA

CITY OF WHITE ROCK'S INVESTMENT BRINGS DRAMATIC IMPROVEMENTS IN WATER QUALITY

WIN-911 software with iFIX HMI/SCADA helps water services avoid unanticipated risks during pandemic



WHITE ROCK IS A CITY IN SOUTHWESTERN BRITISH COLUMBIA, CANADA, NEAR VANCOUVER. IT BORDERS SEMIAHMOO BAY TO THE SOUTH AND IS SURROUNDED ON THREE SIDES BY SOUTH SURREY.

Water Infrastructure Overview

For 40 years, the almost 20,000 residents depended on private utility companies that owned and operated the city's water infrastructure. After realizing more transparency and greater investments were needed, the city acquired the utility in 2015. Since then, White Rock has taken many steps to improve the water quality, including increasing water storage capacity by 33 percent, investing nearly \$12 million to construct a water quality treatment plant, and completing a health-mandated secondary disinfection throughout the entire distribution system.

White Rock's water system is comprised of seven deep water wells, one water treatment plant – utilizing ozone as a pre-oxidant and a filtration system for the primary removal of manganese and arsenic – two booster pump stations, three reservoirs and three PRV stations. Water Services

provides water treatment and distribution for all of the City's drinking water. The team also monitors water quality, chemical treatment, flow controls and pressure points throughout the distribution system.

" We needed a modern software notification system that could dependably monitor the city's water quality, levels, pump stations, electrical components and flow controls."

— Chris Zota, IT Manager, City of White Rock

Challenges with the Old System

For many years, the utility operated on an old SCADA platform utilizing an outdated hardware auto-dialer alarm notification system. This caused many problems, including providing inaccurate telemetry and overflowing reservoirs. The system was limited to eight inputs, which presented challenges in deciding the most crucial aspects to monitor.

Water Services knew they needed an upgrade and installed GE Vernova's iFIX and WIN-911 alarm notification software that allowed them to monitor all pertinent equipment and water quality parameters with room for expansion.

"We needed a modern software notification system that could dependably monitor the city's water quality, levels, pump stations, electrical components and flow controls," commented Chris Zota, IT manager City of White Rock.

SCADA and Alarm Notification Upgrade

White Rock began by implementing a Water Master Plan that coincided with the water quality treatment plant construction. City leaders knew this was the perfect time to once again upgrade the SCADA platform and integrate a more robust remote monitoring and notification software system. After thorough research, the city selected GE Vernova's iFIX Dual SCADA and WIN-911 Interactive as a solution, to push critical plant alarm and event details to remote workers via SMS Text Message.

Implementing the latest alarm notification platform, WIN-911 Interactive, has provided a centralized and unified system that integrates well with the SCADA platform. Additionally, it improves safety, reduces workers response times and delivers information quickly.

Two recent incidents have proven the value of alarm notification software. The after-hours, on-call operator received notification from WIN-911 that a 'VFD Fault' alarm was active. Receiving this notice allowed the operator to remotely intervene, assess the situation and correct the issue in a timely fashion.

WIN-911 also alerted the on-call operator to an early morning hydro power outage that effected the WTP and one booster pump station. After being notified that the emergency generators were running at their respective locations, the operator was able to remotely login to SCADA and confirm that all systems were running, and that the emergency back-up power system was operating smoothly.

"WIN-911 assures users of receiving timely alerts that could potentially affect customers' service. The quick notification means operators can immediately respond to issues like monitored water quality parameters, equipment, or possible water main breaks occurring during or after hours," commented Dean Brown WDII, WTII operator City of White Rock. "This saves time and can mitigate the potential of service disruptions due to slow response and the escalation of an otherwise unknown situation," Brown added.

“WIN-911 assures users of receiving timely alerts that could potentially affect customers' service. The quick notification means operators can immediately respond to issues like monitored water quality parameters, equipment, or possible water main breaks occurring during or after hours.”

— Dean Brown, WTII Operator, City of White Rock



SOFTWARE DURING THE PANDEMIC

State-of-the-art digital technology helps avoid unanticipated risks. These innovations can drive significant economic and environmental improvements, and ensure continuity in service when staff are working remotely, like during this pandemic.

Under increased and unprecedented pressure to do more with less, and to find new means of paying for infrastructure, water owners and operators recognize that it is essential to understand and optimize the capacity of their assets. One way they can do this is through the use of remote monitoring and notification software, which allows fewer people to monitor many more assets using devices that people already have, such as smartphones and tablets. Uninterrupted remote availability is essential to ensure that systems can be continuously monitored, even without staff onsite or with very few people working at the facility.

“COVID-19 forced all of our workers offsite from March through June”, Zota added. “Because of WIN-911, we received important notifications via our tablets or smart phones and were able to fix any problems remotely, ensuring emergencies didn’t occur and avoiding any unplanned downtime.”

“COVID-19 forced all of our workers offsite from March through June. Because of WIN-911, we received important notifications via our tablets or smart phones and were able to fix any problems remotely, ensuring emergencies didn’t occur and avoiding any unplanned downtime.”

— Chris Zota, IT Manager, City of White Rock



FORMELLINO WASTEWATER TREATMENT SOLUTIONS FOR THE WATER INDUSTRY

"We used [GE Vernova] products in this plant for the first time, and despite the complexity of the logics and the installations, we encountered no problems at all."

— Alberto Tabanelli, Novanet Technical Manager

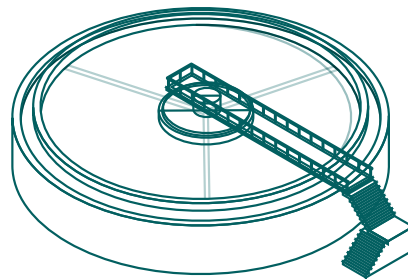
Results

- All plant data is collected and used for predictive calculations and for optimizing process efficiency
- Improved water purification process and 30% energy saving
- Improved water quality and better control of crucial river habitat parameters

The Formellino plant purifies 1000 m³/hour of water, diverting it from water flowing to the Lamone river.

WATER IS CLEANER WITH GE VERNOVA

The Formellino Wastewater Treatment plant at Faenza is managed by Hera Imola—Faenza S.r.l. It is a medium-sized installation, which purifies 1000 m³/hour of water and runs 24 hours a day, seven days a week. The plant must ensure that all of the water produced by the purification treatment process meets or exceeds the required quality regulations.



THE PURIFICATION TREATMENT PROCESS

The Formellino Wastewater Treatment plant diverts the water flowing into the Lamone river, splits the flow onto two parallel lines, and directs the two flows to the treatment tanks. The water is pumped back downstream into the river after the purification treatment process. The activated sludge purification system is a biological type where organic substances and ammonia are oxidized in the presence of oxygen by the activated sludge. The nitrate products, typically eutrophying nutrients, are later removed in absence of oxygen. Consequently, the oxygen content, the active sludge concentration, the nitrates, and the ammonia are key data inputs of the plant process control system. The first steps upon entrance into the plant are grit removal and deoiling (not managed by the control system). The first active step of the plant follows: the equalization and primary decantation tanks form a vessel for controlling the sewage flow rate into the various tanks by means of sluices (a simple level gauge is used for this).

Then sewage reaches the oxidation and pre-denitrification tanks where the level of oxygen in the slurry is measured at the inlet and at the outlet. The nitrates and suspended solids are also measured in these tanks (by means of turbidimeters, which are designed specifically for measuring turbidity by implementing optical techniques), along with the phosphorous and ammonia contents, the level of decanted sludge, and the inlet and outlet water flow rate. Some of the output sludge is recirculated back to the inlet and reintroduced to improve the biological processes. After oxidation, the water flows to the secondary decantation tanks where the sludge deposited on the bottom is collected and conveyed to the thickener. Here, the sludge is prepared for drying and disposal. The clarified water is instead released into the river.



PLANT CRITICALITIES

The water treatment plant is, due to its intrinsic nature, subject to seasonal variations determined by rainfall. Consequently, one of the process criticalities is that the quality of the water to be treated cannot be determined beforehand. Furthermore, the plant collection basin includes a number of industries, which introduce large amounts of waste, thus the water chemistry and flow varies greatly. Another criticality of a plant like this, with such an extensive coverage, is that it is always on. This is essential to prevent the risk of releasing polluted water into the river and to prevent being fined by the water quality monitoring authority.

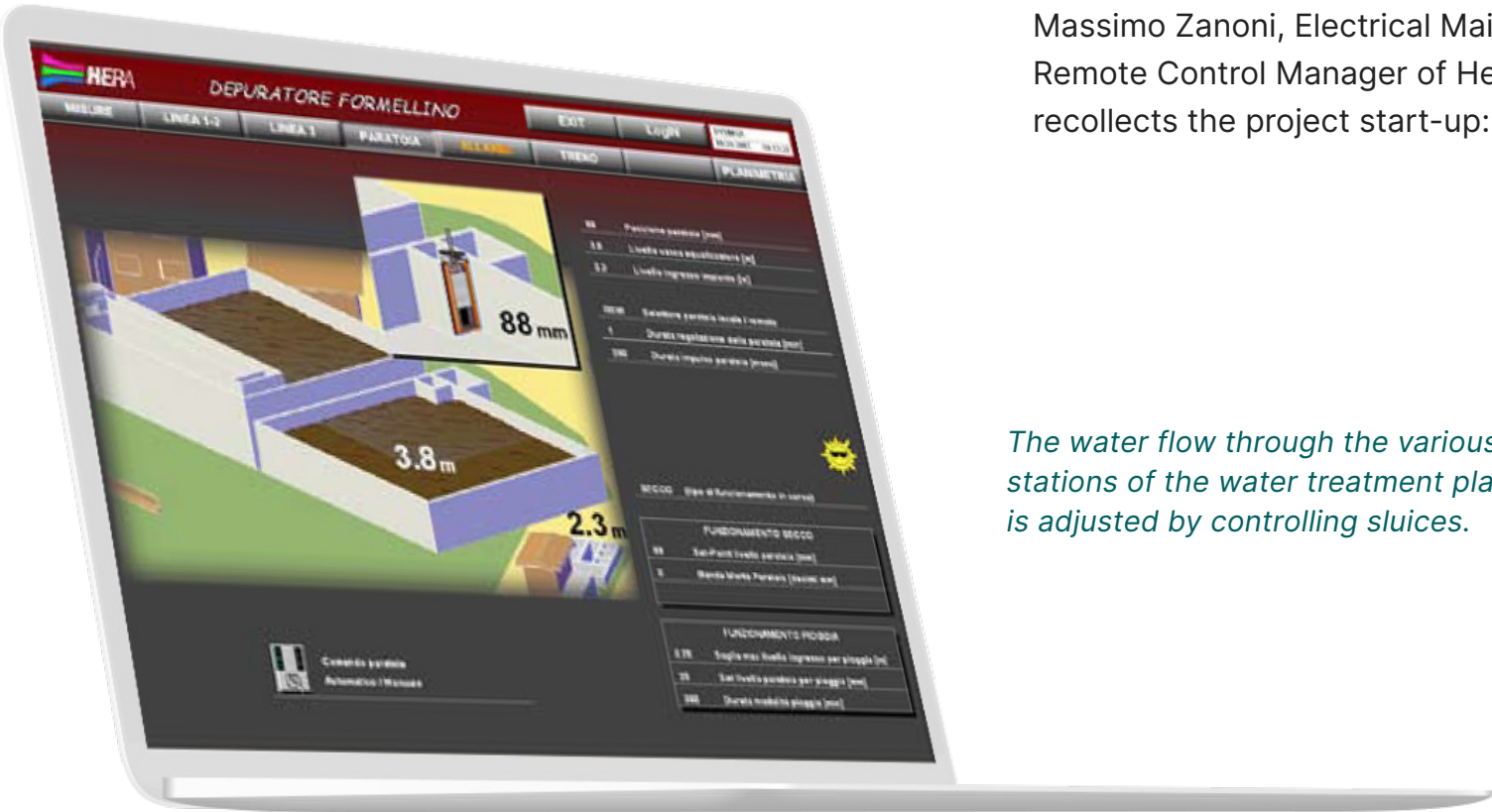
BEFORE AND AFTER

The old plant was run according to a fixed time logic. This consisted of making the sewage water stand in the various vessels for a predetermined length of time and controlling the operation of the process-related machines (aerators, blowers, pumps, etc.) according to dissolved oxygen measurements and laboratory test data only. The goal set by Giovanni Tedioli, Water Treatment Manager of Hera Imola—Faenza, was to use the data collected by various sensors to control the transit times of the sewage in the tanks and machine operation according to the values of oxygen, ammonia, suspended solids, and nitrates to improve plant processing and energy efficiency. Furthermore, the new control system had to allow an operator to work at the plant as well as relaying data to the control room from where all Hera plants are monitored. The plants are manned during the day, but the control room alone monitors the operation of all water treatment plants during the night.

Massimo Zanoni, Electrical Maintenance, Automation and Remote Control Manager of Hera Imola—Faenza S.r.l., recollects the project start-up: “When we decided to

refurbish the plant, we asked ourselves how to make sure that the new automation system would guarantee our peace of mind. The water treatment plant releases water into our own rivers and this implies additional responsibilities towards society: we need to guarantee faultless operation, for ourselves and for our environment.”

The “peace of mind” Zanoni mentions was then to be translated into high plant availability and reliability, data access by operators, and improved process management in terms of better results and more efficient use of energy resources. In order to reach these goals, Hera called Pastorelli’s Environmental Engineering firm to establish the project guidelines. The system was made by Novanet, a company based in Emilia-Romagna, Italy, with major expertise in the construction of large control and automation systems. Hera asked Novanet to use GE products for implementing the control system. These products are standard at Hera Imola—Faenza plants because they are reliable, competitively priced, the construction technology is good, and assistance in case of need is prompt and conclusive.



The water flow through the various stations of the water treatment plant is adjusted by controlling sluices.

THE CONTROL SYSTEM

The “brain” of the system is a PACSystems RX3i (now available from Emerson) in redundant hot backup configuration, which interfaces with all the field instruments on a Profibus network (part optical fibres and part copper wires); there are several new and old sensors in total, amounting to approximately 600 controlled tags. The two redundant CPUs ensure the high plant availability required by the application criticality. The PAC Controller establishes the standing times of the slurry in the various stages of the plant. By means of a direct Modbus/TCP link, the PAC communicates data to the Hera control room, where they are stored in a SQL database and concisely displayed so that the operator (present 24 hours a day) can be warned of faults and act accordingly.

At the Formellino plant, a local computer running CIMPLICITY from GE Vernova, part of the HMI/SCADA suite, monitors and displays information and data in the form of trend or log, in addition to alarms, which may be silenced or not by the users according to their access levels. Ten profiles corresponding to ten different operative and data access levels have been created according to the privileges established for each user class.

The application allows for set up and program control parameters (the plant has been running only for a few months and the control logic is still being fine-tuned). Many fault detecting functions have been implemented in program running at the water treatment plant today to signal measurements deviating from expected values and to collect and use self-diagnostic data from the field sensors.

Novanet, the company who implemented the water treatment control process, was new to GE, despite having made control and automation systems for years.

“We used [GE Vernova] products in this plant for the first time and, despite the complexity of the logics and the installations, we encountered no problems at all,” said Alberto Tabanelli, Novanet Technical Manager. “The PLC hot backup function provided default hardware redundancy, which avoided us further complications, and the system performance allowed us to introduce a predictive control, which has greatly improved plant performance.”



Intuitive displays show the plant status to operators at any given time.



The data collected from the field is used to carry out a predictive control and therefore optimize machine use.

THE RESULTS

The new system collects plant data for constantly monitoring everything in detail. Predictive control, sensor data collection, and use and control system response rapidity have been exploited to optimize machine running times and consequently decrease energy consumption while keeping the water quality high. Before installing the new system, for example, the water was over-oxygenated, and this was pointless from a microbiological point of view. The Formellino Water Treatment plant automation system has been running for only a few months and the implemented logics are still being optimized. After only 50 days, an energy consumption of 30% has already been observed. The plant was shut down for approximately half an hour to allow the new system to be installed. Personnel training was swift, thanks to intuitive, self-explanatory graphic displays, and was carried out over several shifts to account for staff turnover.



FUTURE DEVELOPMENTS

New actuators, which will be controlled continuously instead of in steps, will be added in the future. They will be installed on the Profibus field network and controlled directly by the PACSystems Rx3i. These improvements will provide the best results where the processed matter is kept moving: i.e., in oxidation and sludge recirculation tanks.

ABOUT HERA

The Hera Group was established in 2002 following the merge of eleven public utility companies from Emilia-Romagna. Other companies were acquired during the merging process, including Agea, based in Ferrara in 2004, and Meta in 2005. This completed the first Italian merge of listed stock multiutility companies. The Hera Groups works in approximately 180 towns in the provinces of Bologna, Ferrara, Forlì-Cesena, Modena, Ravenna, Rimini, and in some towns in the provinces of Florence and Pesaro-Urbino. It is split into seven Local Operative Companies, one of which is Hera Imola Faenza, which is responsible for managing water, gas, electricity, remote heating systems, and environmental hygiene over an area of 23 towns.

Hera S.p.A.: V.le Carlo Berti Pichat 2/4 - 40127 Bologna, Italy
Tel +39 051 287111 | Fax + 39 051 2814036
www.gruppohera.it

ABOUT NOVANET

NOVANET is a system integration and engineering firm specialized in building automation, management, supervision, remote control, and home automation.

Novanet srl: Via Quaini, 3 40026 Imola (BO) Italy
Tel. +39 0542 25594 | Fax +39 0542 610546
www.novanetsrl.com

HERNING VAND GATHERS VALUABLE KNOWLEDGE WITH THEIR HISTORICAL DATA

Based in Denmark, Herning Vand strives to efficiently deliver clean water to its customers

Going Beyond Big Data

“Big Data” has become a buzzword and everyone agrees that it is worthwhile to explore the large volumes of data. Herning Vand has invested in an advanced calculator that can help to interpret their process data and already in the first project they came across particularly valuable knowledge.

“We have achieved some excellent results with our first project and we see a great future optimization potential with the tool.”

— Jan Ravn, Chief Operating Officer at Herning Vand



For years, Herning Vand has recorded and saved a large amount of process data that is collected online from Herning Vand's 14 purification plants.

The data is logged with the clear intention to make Herning Vand wiser and therefore better equipped to optimize processes and the overall operations. However, for that to happen the large volumes of data must first be sorted, analyzed, processed, evaluated and thoroughly compared so that the important correlations and trends can be localized.

However, Proficy CSense shall, just like other simulation tools, be used shrewdly and Herning Vand, together with process consultants from COWI who were responsible for the initial consultancy, gained some valuable experience. COWI assists Novotek, a GE Vernova partner, with process technical advice in connection with the use of Proficy CSense.

“A spreadsheet can be used to handle relatively large amounts of data, but it will not work when there are too many parameters in play simultaneously. Therefore, last spring we invested in Proficy CSense software solution, which is dedicated to finding and using mathematical correlations of large amounts of data,” **— Jan Ravn**



IS THERE A CONNECTION?

"I see Proficy CSense as a closed box that is filled to the brim with advanced calculation routines. We just feed the box with the data we want it to compute and then we tell it what parameters we want to observe.

Proficy CSense finds the right mathematical description of the data stream and can then show two curves of the same data stream. One curve contains the actual data and illustrates the process as it was in reality. The other curve is generated by the mathematical model that Proficy CSense has set and therefore shows a simulated process.

When the program is fed with multiple data streams at once, it automatically locates the possible relationship that exist between the different data and that is exactly what we are after."

**— John Sorensen, Senior Project Manager
for water and wastewater at COWI.**



When CSense has found the mathematical models and correlations, the user can then determine which parameters to focus on and what to look out for. Just like when you insert different values into an equation. Here it is just an automated solution to an almost unlimited number of equations.

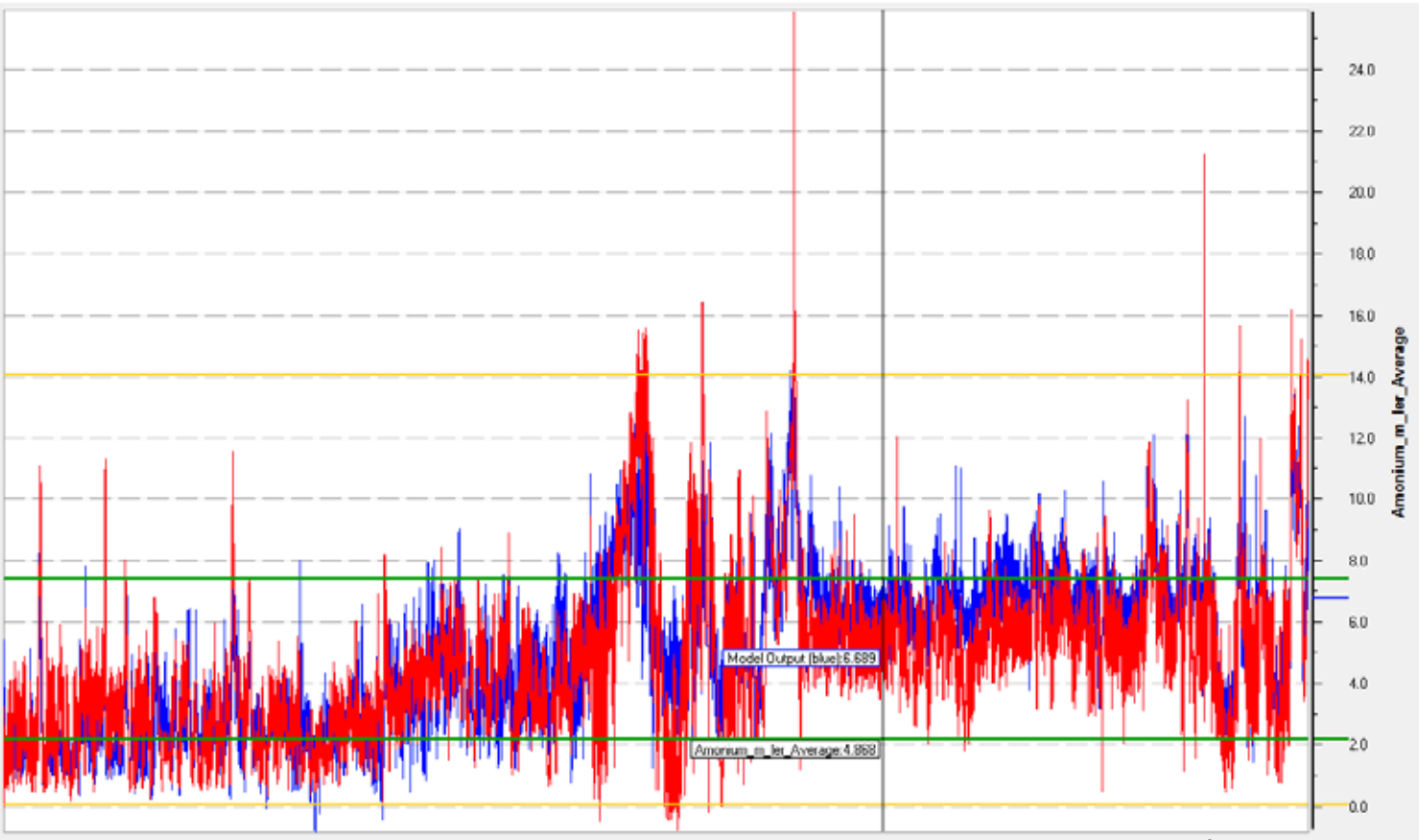


Figure 1: Modeling of variations in ammonium concentration. Proficy CSense has generated a model where the result is shown by the blue line. The red line is the measured values.

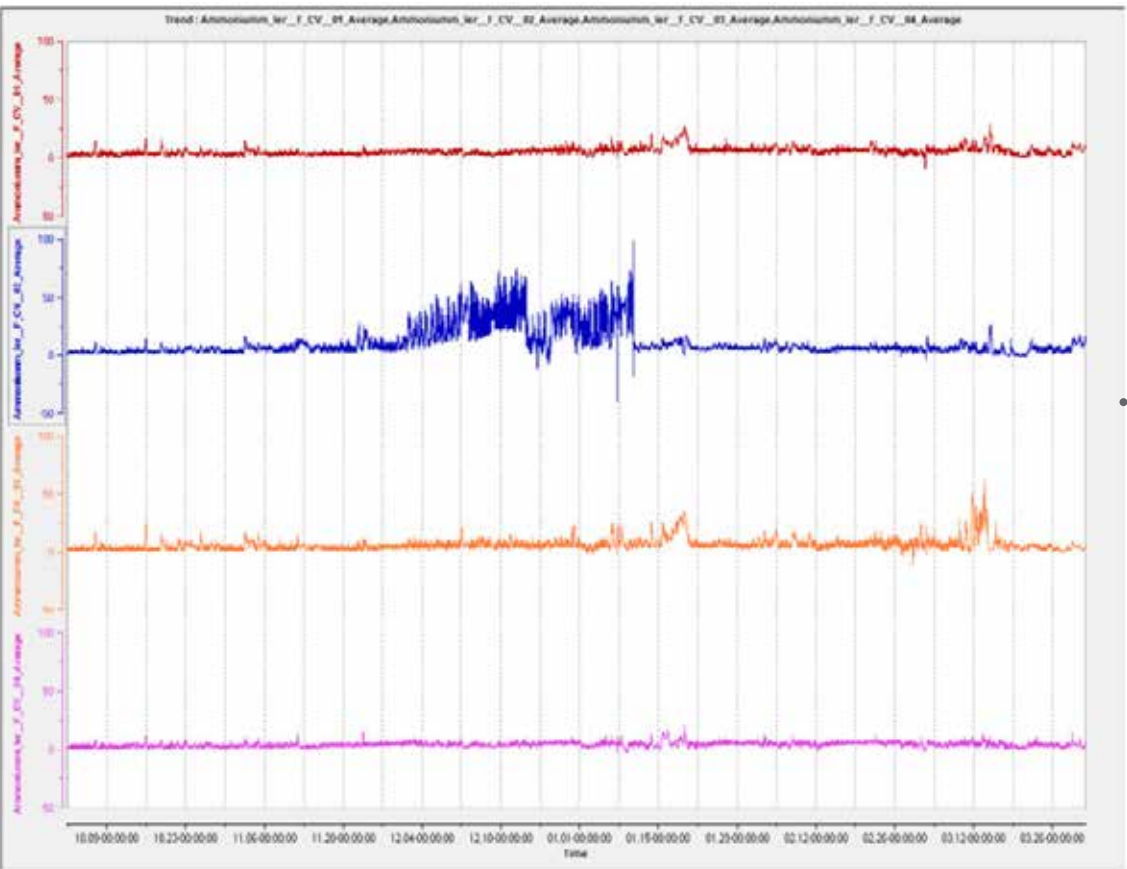


Figure 2: Simple comparison of trend curves to get a quick overview of the situation. The figure shows the ammonium concentration in four process lines.



“We can find correlations that we did not know existed and our theories can be confirmed or dismissed. Once we have located the significant correlations, we can begin to optimize the process based on this new knowledge,”

“If, for example, I want to have output A as high as possible, how should I then set inputs B, C and D?”

—Jan Ravn

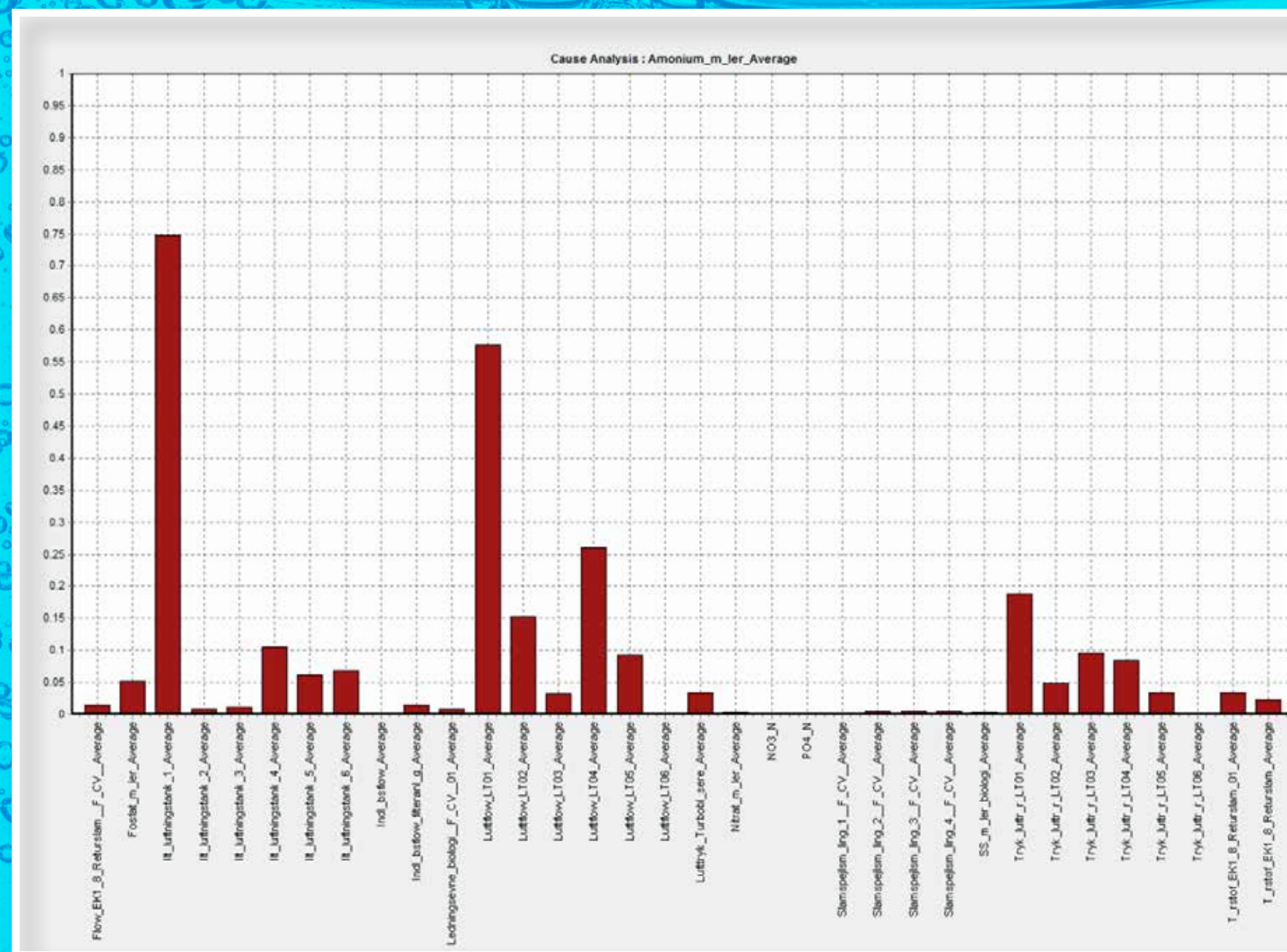


Figure 3: Proficy CSense has identified the parameters that have the greatest influence on a given run-off result.

A SAVINGS OF DKK 500,000

The first project, which was the optimization of the gas production that is based on sludge from the purification plants, gave an output improvement of as much as 20%.

The gas is used for electricity production and according to Jan Ravn the increase corresponds to an annual additional production of approximately 400,000 kilowatt hours, which earns Herning Vand approximately DKK 500,000.

Herning Vand is now engaged specifically in a series of small defined projects that will ultimately achieve the goal of making Herning Vand energy neutral. Cum sociis natoque penatibus

“We knew roughly which buttons we had to press to achieve this gain and so CSense should not take all the glory. However, the tool makes it much easier for us to check the accuracy of our assumptions and it can also show us the way to the process-related correlations that we cannot find ourselves. — Jan Ravn

The Art of Definition

The advice from Jan Ravn and John Sorensen is that you have to be good at defining the amount of different data that CSense works with and you get the best and fastest results if you have relatively robust process knowledge.

The more data you put in means you get more answers out at the other end. However, there is of course an upper limit, and too many parameters in play can make it difficult to understand the results.

As Jan Ravn explained, "Our advice to new users is that you start simple and carefully consider both what it is you want to have answers to and also what parameters are likely to affect these answers. If you do not know exactly which parameters affect your focus area, you can gradually reduce the number using Proficy CSense as you test each one. When the data streams are recorded and analyzed they fit together mathematically, so when you adjust each parameter up and down with the mouse, you see how the other parameters are affected to either go up, down or remain unchanged. When you have isolated the relevant parameters there is the option to activate the tool to simulate towards an optimum process within a given framework."



Jan Ravn and John Sorensen assess the collected information.



"The first project is only the tip of the iceberg in relation to what we expect to achieve with Proficy CSense. We have an ambition that the tool will be used regularly for small and large projects, and therefore assist us to pick all the low-hanging fruit that would otherwise be missed during a busy working day."

"The findings are instantaneous and the application potential is great."

— Jan Ravn



GE VERNOVA

iFIX HMI/SCADA AND WIN-911 COMBINE TO BABYSIT WASTEWATER TREATMENT AT NIGHT IN IOWA CITY

- *Lower costs - Night-time monitoring & alarms*
- *Faster response - Alarm notifications*
- *Less risk - Reliable SCADA & alarm management*



INTRODUCTION

Municipality

Iowa City, Iowa

Products

- iFIX HMI/SCADA
- WIN-911



Challenge

Resting Easy with Automation

The municipal treatment plant for Iowa City, Iowa has 15 mgd (million gallons per day) of treatment capacity between two plants. The system serves a population of 67,000, a wastewater treatment plant (WWTP) population equivalent of 120,000 since the system services all of Iowa City and small town of University Heights as well as the University of Iowa with a student population of almost 30,000.

The City had been staffing their WWTP system 24/7, but could see that with the upgrade to GE Vernova's iFIX HMI/SCADA, the night operator was unproductive and bored. The overnight position was difficult to keep staffed and if a dramatic event occurred at either facility, the night shift operator would likely be unable to handle it himself.

Solution

"Once we upgraded our SCADA, we were close to letting the SCADA handle the plant at night, but we didn't have the key pieces. We needed to work out a system for reliable notifications, that's where WIN-911 came in," said Dave Elias, Wastewater and Landfill Superintendent for Iowa City.

"We have been relying on the WIN-911 system and staffing our facilities only 10 hours per day for years now. It's a computer babysitter."

— **Dave Elias**
Wastewater and Landfill Superintendent,
Iowa City

iFIX HMI/SCADA and WIN-911 Alarm Notification

Iowa City runs an iFIX SCADA system with three nodes operating in three different locations via a local area network. In combination with iFIX, WIN-911 is set to run 1900 alarms ranging from monitoring tank levels and flow failures to building temperatures and rises in plant conditions. To ensure full coverage, the municipality runs a back-up copy of WIN-911 on a separate PC in another location.

The WWTP facility's two plants are five miles apart, with one operator on duty on the weekend. With WIN-911 on alert, that operator can be more productive, monitoring plant conditions in one location while at another.

"It's helpful for operations to be away from the computer system to respond to any alerts but still see if any other conditions are raised while they aren't near the computer," said Albert Figueroa, Senior Treatment Plant Operator.

RESULTS

Early Warnings and Fast Response

Based on the iFIX A&E data, WIN-911 was called into action when a waterline broke in the basement of one of the WWTP buildings, triggering an alert. “WIN-911 sent us cell phone notifications and we had early warning to respond,” said Elias.

WIN-911’s intelligent decision matrix also allows the City to categorize alerts, recognizing urgent responses from less immediate concerns. The urgent alerts are sent as text messages to the maintenance staff on-call cell phone, where WIN-911 makes it easy for that employee to call for additional assistance, if needed. The less urgent alerts are sent to the maintenance supervisor’s computer station, where items are evaluated and prioritized for action.

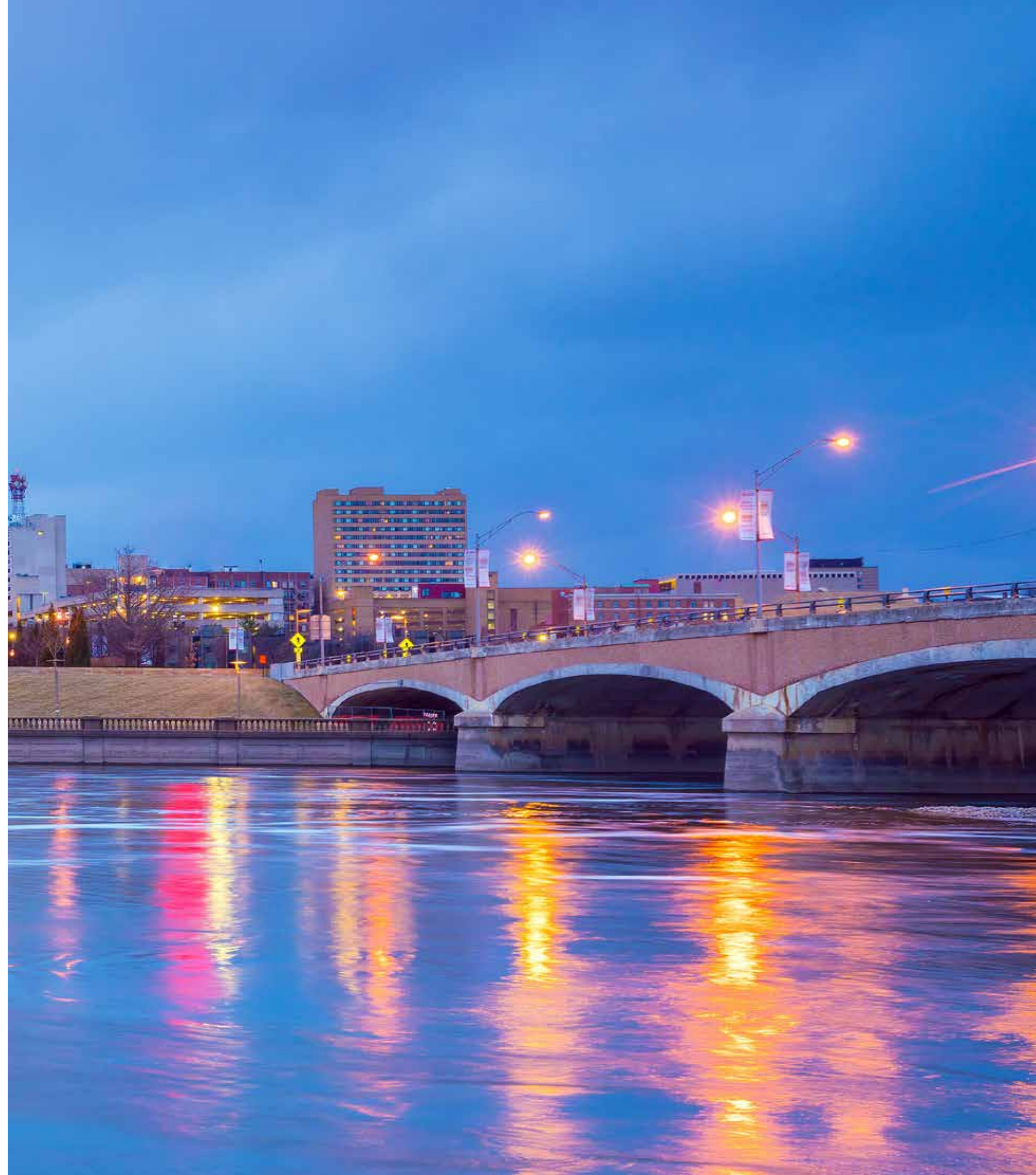
“WIN-911 sends different levels of response based on the issue,” added Figueroa. “We also receive early warnings, which allow us to start investigating before issues become big problems.”

“WIN-911 has given us the ability to respond early. It’s robust as a warning system. If one alarm doesn’t get your attention, the next ten will.”

Dave Elias - Wastewater and Landfill

Superintendent, Iowa City

**— Dave Elias - Wastewater and Landfill Superintendent,
Iowa City**





KOREA WATER RESOURCES CORPORATION

K-water works with GE Vernova to realize the optimal solution for the global water industry, providing the highest efficiency and quality



SINCE ITS ESTABLISHMENT IN 1967,

The Korea Water Resources Corporation (K-water) has worked toward more efficient development and management of Korea's water resources. To that end, they are continuing the aggressive pursuit of change and innovation in water management practices as the next big step towards becoming "a global water environment specialist."



K-water started a journey with GE Vernova to develop a centralized and integrated water solution for all over the world as Water-K, an OEM brand name for GE Vernova's iFIX HMI/SCADA for the automation of water supply facilities and the standardization of water treatment process , and K-water renamed it as iWater and exports to the companies in the water industry across all over the world.

K-water has managed 56 water control facilities including 20 multi-purpose dams, 16 multifunctional weirs, and the Nakdong River Estuary Bank, to provide a clean and stable water supply. In addition, K-water has built 48 wide-area and industrial water supply facilities with a daily supply capacity of 17.6 million m3 and currently supplies drinking water to 22.3 million Koreans.

K-water has been entrusted to operate the water supply systems for 23 local governments, starting with Nonsan and most recently Cheongseong by using iWater.

K-water supplies industrial water of various quality of levels, customized to the needs of customers, and is becoming Korea's leading supplier of water for industrial purposes thanks to the development of high-efficiency, low-cost water treatment process and the optimized automation and centralized integration of its data by using our system.

Lastly, K-water treats 12.8 million m3 of sewage per day to improve the water quality of streams and enhance public hygiene, thereby creating a better living environment. K-water is managing the entire country by dividing into 3 regions along with the rivers such as Hangang River Regional Head office, Nakdonggang River Regional Head office and Geumgang, Yeongsangang & Seomjingang Rivers Regional Head office. By using iWater, K-water has moved beyond the simple management and utilization of water and achieved integrated water

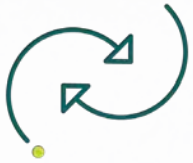
resources management of these regions' water supply systems and local water supply system throughout the entire South Korea by applying ICT to the management of water quality and ecology. Thereby it allows equal distribution of the benefits of water to everyone, everywhere.

Success of the integrated water management system is the key to national water safety and public water welfare. K-water promises to provide healthy water circulation for all to protect citizens from disasters such as flood and drought and ensure greater happiness through the sharing of water.

The company is working tirelessly to develop and manage water resources in an environmentally friendly and efficient way.



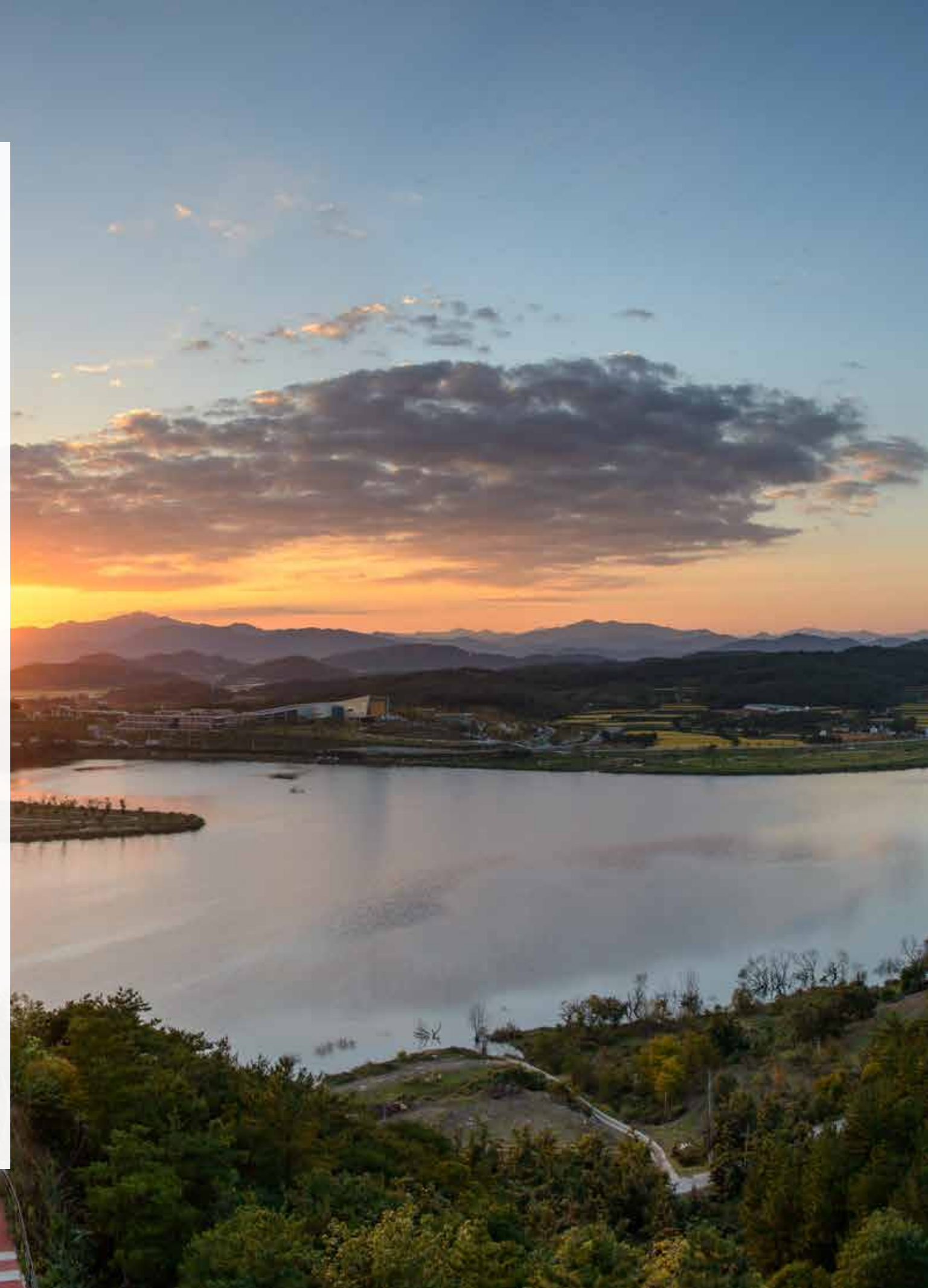
- Drinking water for 22.3 million Koreans
- 56 water control facilities
- 20 multi-purpose dams
- 16 multifunctional weirs
- 48 wide-area & industrial water supply facilities
- Daily drinking water supply of 17.6 million m3
- Daily sewage of 12.8 million m3
- 23 local governments





THEIR GOALS INCLUDE:

- To promote the integrated management of water-related facilities
- To establish seamless flood control and irrigation systems by leveraging information technology
- To produce and supply the world's safest and best tasting tap water
- To further expand into international water markets
- To increase their social responsibilities as a government-run company



LONG-TERM PARTNERSHIP WITH GE VERNOVA

To fulfill their goal of being a global company specializing in water resources, K-water wanted to find the best business partner for a specialized software application to offer as an OEM solution in the water industry.

“When we selected the software for the water system, we considered who had the largest number of installations and who had the best reputation in the water industry throughout the world,” explained the IT Manager for K-water’s Water Supply Division.

K-water determined that they needed specialized software to eliminate the concern for water-related disasters and environmental issues while also promoting the fair distribution of benefits from clean, safe water.

“GE Vernova has provided stable and sustainable solutions for many years without any defects for K-water,” Water Resources Management Division Manager said.

In the result of the company’s effort to develop and manage water resources in an environmentally friendly and efficient way, K-water’s integrated water management system, iWater, is widely used not only in Korea but also in other countries such as Algeria, Indonesia and Thailand.

K-water is taking the experiences and wisdom built up over the past 50 years as a precious resource. K-water will take the lead in solving the water issues, which are urgent matters in Asia and around the world.

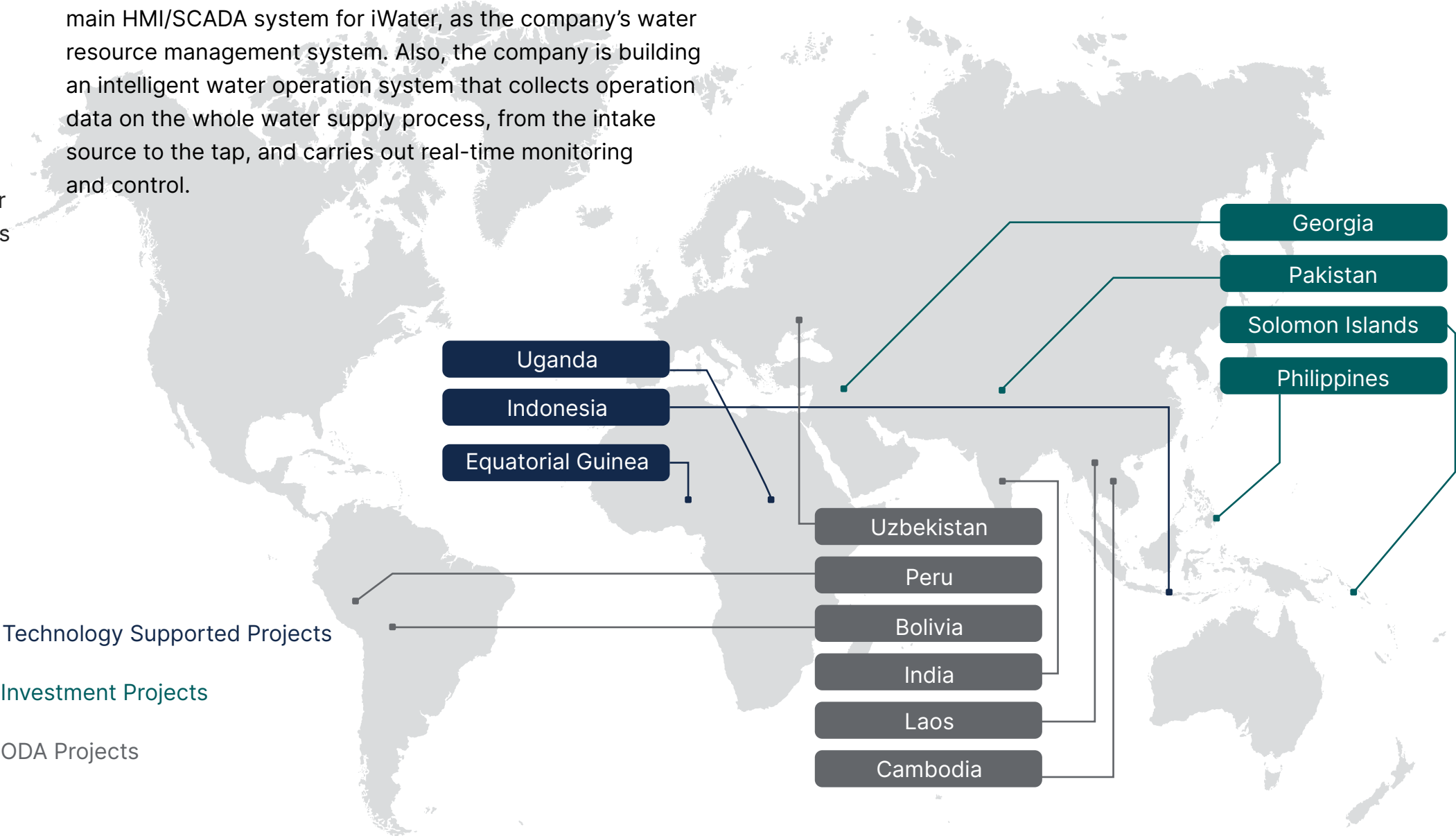
INTEGRATED WATER MONITORING SYSTEM

Considering all factors influencing water management in each basin, K-water carries out water resources management through the integration and intelligent management of water quantity, quality, ecology and environment, which were previously managed separately.

K-water, as Korea’s only organization with the capability to deal with all fields of water resource surveys, including surveys of sluices, basins and groundwater, provides to the public all water-related data collected in real-time through iFIX as its main HMI/SCADA system for iWater, as the company’s water resource management system. Also, the company is building an intelligent water operation system that collects operation data on the whole water supply process, from the intake source to the tap, and carries out real-time monitoring and control.



- Technology Supported Projects
- Investment Projects
- ODA Projects

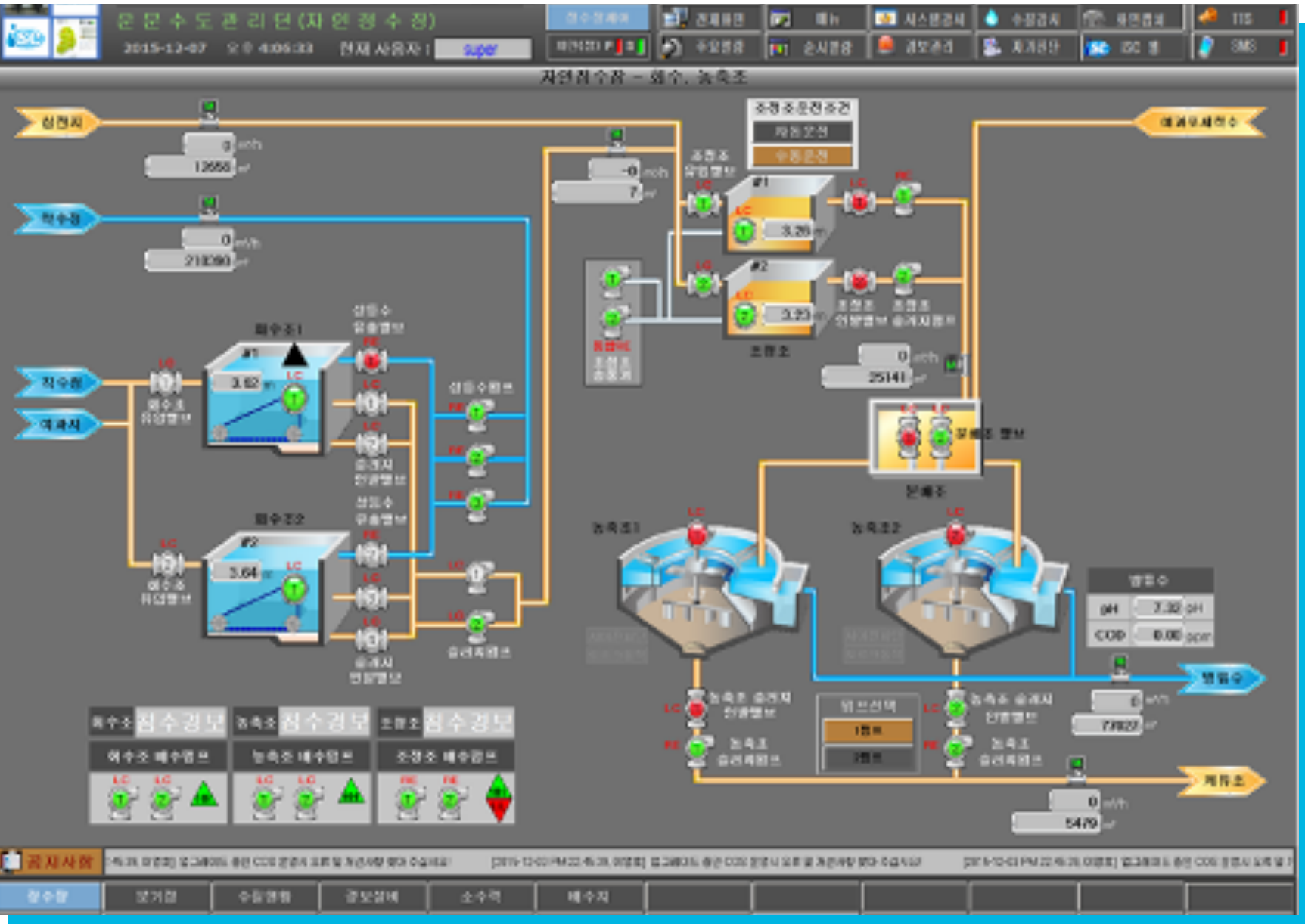


iFIX is part of the Proficy family of automation software products, a single intelligent production solution that works with existing multi-vendor hardware and software solutions to gather and analyze data. Solutions can connect to equipment across the entire physical enterprise to deliver both on-line monitoring for rapid operational response as well as collect historical data as the foundation for continuous improvement. So, K-water can implement many other useful programs by using the third-party interface of iFIX.

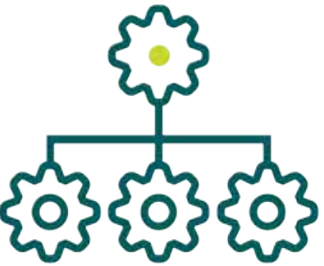
“Compared to other HMI, it is possible to operate a wide range of operations from the perspective of the operator and system integrator. iFIX provides a friendly development environment for the engineer so that we can easily customize and use it. It supports various interfaces such as VB Script, .NET API, Dynamo functions and AlarmQ functions so that we can develop complex requirements of operating personnel,” Hong Jintaek, System Integrator developer for K-water, said.

iFIX offers canned functionality to drill into tag details, instantly trend variables, view enterprise data through hosted portal displays and deliver thin client connectivity to SCADA nodes through terminal services. Graphic tools deliver a variety of drawing productivity tools and advanced capabilities for 3D piping and connected object management.

“iFIX supports Standard Dynamos. Using Dynamos, various objects such as pumps, valves, and tanks used in K-water are developed in the form of a ‘standard dynamo’ and delivered to operator and developer to design the screens based on this. Even though many people design various screens, it looks like one person designed them because of Standard Dynamos. The biggest advantage is that operators can work without a hand-over even if the workplace is changed,” Hong Jintaek, System Integrator developer for K-water said.



iFIX is ideal for use in Water/Wastewater facilities and is installed in some of the largest plants around the world. And, Proficy is a proof point of GE Vernova’s lean strategy by delivering a customer solution that simultaneously improves a customer’s operating and environmental performance.



WATER, WATER EVERYWHERE

The iWater system interfaces with water treatment equipment management systems, application computers that need to forecast the system, and real time water management DB servers. It has the flexibility to communicate with other third-party software even though local PLC and DCS systems are included.

GE Vernova provides customer-focused OEM contact to achieve great customer satisfaction and has stepped forward as a long-term business partner with a win-win strategy. K-water developed many efficient applications as well as mobile monitoring system and included in the iWater brand as part of its business master plan.

An integrated operating system, the iFIX-based GIOS has many redundant features and is functionally distributed for the highest level of reliability and performance. Identical servers run in parallel, so if one fails, the client can switch to the other server automatically. And, the file server contains recovered process values, messages, and data from the failure time period that can be automatically updated from the archives. In addition, the iFIX server controls the data processing of all events from RTUs and SCADA in the RDAC system. GE Vernova technology can also help K-water to secure new water resources by building more small and mid-sized environmentally friendly dams and by building a society free from worries about water stress with technologies for alternative water resources such as deep ocean water, groundwater and desalination.

“We provide a wireless tablet environment by using iFIX’s option of Proficy WebSpace and multi-sessions. It enables K-water’s operators to check data at sites when they fix some equipment failures, so that operators’ maintenance work is getting quicker and more efficient.” Hong Jintaek, System Integrator developer for K-water said.



MPGK KROSNO IMPROVES RELIABILITY WITH SCADA AND HISTORIAN INTELLIGENT CITY SOLUTION



INTRODUCTION

Company

MPGK Krosno

Faster response

Easy, intuitive system

Products

iFIX HMI/SCADA

Better decision making

Reliability data for "intelligent business"

Lower risk

Increased security and reliability



Janusz Fic, Prezes Zarządu (Chairman of the Board),MPGK Krosno:

MPGK Krosno conducts business activity in the field of municipal and urban engineering in the area of Krosno city and its neighborhood. The employment in the company is above 300 people. Our mission is to work for the local people and environment. Therefore, the high standard of our services is of great importance to us. Over the last years, we have managed to improve ourselves, mainly thanks to cooperation with VIX Automation Company and our collaborative work on the implementation of control and process programming area. Optimization of technological processes had a big impact on security improvements and enhanced reliability of provided services. Economical effectiveness of those processes has also been improved.

Automation for Distributed Assets

Wladyslaw Sokolowski. Glowny specjalista ds. IT (Chief IT Specialist), MPGK Krosno:

Our business has multi-branch distributed structure which consists of 7 main objects and 300 smaller objects spread out on a mountainous area. Immediate access to data, integrity of data, and uniform reporting method are crucial to us. Thanks to Proficy software (iFIX and Historian), we are able to analyze data from all objects up to date and predict a possibility of danger. Thanks to the software provided by VIX Automation, we have managed to build a consistent information management system, report on renovation parameters of the objects and enhance their reliability. We have created a team of SCADA experts who work together to create the system that improves the quality of municipal services we provide.

Automation for Distributed Assets

Janusz Fic, Prezes Zarządu (Chairman of the Board), MPGK Krosno:

If we want to manage our company in a responsible way and to be socially useful, it is necessary to meet the expectations and take the challenge. The solution is to implement intelligent business, which makes decisions based on reliable data, reduces loss, predicts future needs of the clients, increases security, and reliability of services. MPGK Krosno took such steps together with VIX Automation company. In the last few years, it implemented technologies created by the leading global brand, GE. Thanks to this, in a significant way, we have improved effectiveness of different processes, and what is more, we have become one of the best municipal and urban engineering companies, which is proved by many awards. I recommend VIX Automation company as a reliable and credible partner.

About VIX Automation

VIX Automation is an Authorized Distributor of GE Vernova in Poland.

They are one of the leading suppliers of comprehensive IT solutions for production on the Polish market. 15 years of experience, qualified engineers and knowledge of the specificity of the Polish industry allows them to provide their clients the highest quality services.

The VIX Automation offer includes: SCADA and MES systems, production archiving and reporting systems, production scheduling, production efficiency analysis (OEE), software consultations and audits, implementation services, optimization and updating of existing systems.



MPGK Krosno has a multi-branch distributed structure spread out on mountainous area. Thanks to Proficy software, the company is able to analyze data from all objects and predict a possibility of danger.



One of the main elements of the system is iFIX SCADA control and visualization software. The whole control and archive is gathered in the plant control room. The system runs about 2000 variables.



MALTA - WATER SERVICES CORPORATION

SCADA revamp with CIMPLICITY reduces waste and increases efficiency of entire archipelago's water service



OVERVIEW

Infrastructure management always involves special needs, commitments, and measures. A challenge that becomes even more important as the infrastructure is strategic and geographically extended. All these complexities are perfectly illustrated by the revamping of Malta Aqueduct conducted by ServiTecno. A project of particular significance, not only because it involves an infrastructure of national importance, but also because of the expertise required and the complexity of the project.

Products

- CIMPLICITY HMI/SCADA
- Proficy® Historian
- IGS
- Proficy Webpace

The logo for ServiTecno, featuring the company name in a bold, green, sans-serif font.

Introduction to Malta Aqueduct

The management of a national aqueduct requires special attention because it introduces levels of complexity, not necessarily technological, that are rarely found in the management of non-strategic infrastructures. To better clarify the scenario, let us take a look at some numbers regarding extension and technical specifications.

First and foremost, the aqueduct of Malta serves more than 550,000 people, either in terms of distribution of drinking water and wastewater collection, distributed between the Island of Malta and the Island of Gozo, located 4 km away. The overall supply is about 98 thousand cubic metres for Malta and 10 thousand cubic metres for Gozo. Drinking water comes mainly from underground extraction stations. Through the main control room, it is necessary to monitor the entire infrastructure and, above all, ensure effective and timely support in the event of failures or malfunctions.

1. The challenge of numbers in station management

Overall, the infrastructure currently has more than 500 stations, between extraction, sorting, collection, and management, divided into two sub-infrastructure: one for the distribution system and one for the wastewater collection. A logical and functional subdivision: in fact, there are two parallel systems also in terms of implementation of digital controls. The one related to the distribution, previously implemented, was the object of revamping by ServiTecno.

2. Managing the operational complexity

In managing large projects, especially when they have many years of historicity, the implementation often takes place on a contingency basis, particularly when the infrastructure evolves over time. In the case of Malta Aqueduct, the subsequent implementations of new stations had led to

an unstructured situation, in which the user control interface used 110 different objects, each one with its own navigation and control logic.

Basically, each station was managed and controlled through an almost proprietary administration page, which made operations (both daily and extraordinary ones) and staff turnover complex. In fact, operators had to know the HMI system used before being able to gain operational autonomy.

A situation that also resulted from the heterogeneity of the system: Malta Aqueduct, as a public company, relies on tenders for supplies which, for example, makes it operationally impossible to adopt a specific brand or model of sensors and monitoring tools, given that Malta tendering mechanism, which is very similar to the Italian one, rewards the best offer on the market for each call.

3. The past ecosystem of Malta Aqueduct

Malta Aqueduct already had a monitoring and management infrastructure. The previous implementations were already using GE Vernova products. This choice was based on the guarantees and reliability offered by the GE products needed for government infrastructure, as David Pace, IT System Architect of the Water Services Corporation (WSC), and Shaun Grima, Operations Manager at the facility (both representatives of the aqueduct) explain.

It was precisely GE Vernova's expertise that was behind the contact between Malta Aqueduct and ServiTecno, referred by the vendor itself for its Customer Care service on GE Vernova products. Since the first interaction, there has been an increasingly close collaboration between the companies, which culminated in the launch of this revamping project.

CHALLENGES IN A REVAMPING PROJECT

Malta Aqueduct is an infrastructure that presents numerous specificities that make it a case study of great interest, especially for its territorial extension and for the heterogeneity of the endpoints present within the different stations, particularly in terms of type, quantity and functionality of the sensors used. Temperature, pressure, chlorine concentration and various level measurements represent just some examples.

Furthermore, ServiTecno had to consider some aspects related to field operations.



HOME PAGE

The comparison between the previous “home” screen and the current one. The map view allows to identify geographically all the stations and to immediately visualize their condition.



1. Taking over a previous development

While operating mainly at user experience level, the challenge of taking over a project is not to be underestimated. In fact, before the operation, it is necessary to fully understand the logic, the solutions used, the criticalities and the strengths of the resources in the field. ServiTecno has put in place the necessary resources and professionalism to carry out an extremely accurate assessment of the plant, before elaborating its implementation idea.

2. Complex logistics

The revamping of the SCADA system mainly concerned the Operations Centre, but that doesn’t mean that there were no challenges related to logistics. A plant with such an extension requires specific updates and precautions, especially considering that, in addition to the physical distance between

stations, accessibility to many of them is limited or impervious. In these cases, making a blocking error, or enabling operators to do so, means introducing significant delays and considerable cost items.

3. Need to rationalise the user experience

The main decision driver by Malta Aqueduct in revamping its management system was the need to rationalise user experience, making it as uniform as possible, and reducing learning time for new hires. Moreover, it was necessary to build resilient implementation logics, which allowed the creation of new power plants according to a uniform and more efficient scheme.

4. ServiTecno’s project

Given the complexity of the project and the specific needs, the choice was to adopt a lean approach: modernize and standardize control systems, while retaining as much as possible of the user experience that the staff know and manage daily. As you might guess, operations were concentrated mainly on HMI level, leaving the PLC part as unaltered as possible and interfacing with sensors and readings. At this level, ServiTecno proposed a minimally invasive normalization of data and communication protocols using the unified OPC protocol, necessary to standardize the readings and to make the system future proof in view of the opening of any new stations.

Alignment was another purpose of the intervention: that is, a technological upgrade of the systems, which allowed the system to gain resilience to new technologies and extend their life cycle as well. In fact, even these operations must be carried out with awareness to eliminate the risk of unforeseen events, especially when dealing with strategic resources.

SERVITECNO'S SOLUTION

After the assessment and design phases, it was finally time for field implementation, which was divided into several stages of processing.

1. Revamping and rationalizing the interface

The main part of the first phase of this project was undoubtedly the redesign of the interface, where the main challenge was to design a navigation and management system that was simultaneously usable and not too distant from the logic already known to operators. The choice was to unify as much as possible the logic of representation of the different elements of each station, build a uniform system of controls, including navigation, and create a side panel containing some contextual information and a more agile transition between different areas of the interface. This operation, apparently taken for granted, in the previous version was entrusted to a series of board-specific solutions.

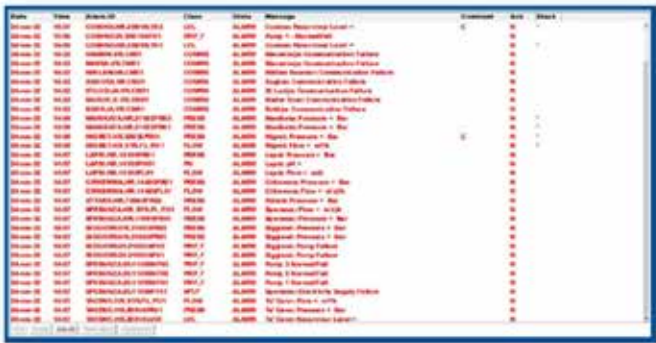
2. Creation of a unique system for stations representation

The second major concern was the standardization of the pages representing each station. In fact, in the previous version of the system, the control software involved 110 different types of objects. The number has been reduced to 15 through a process of analysis and rationalization, improving the simplicity, immediacy and learning curve of the system.

Moreover, ServiTecno developed an automation for the creation of new stations. This allows both to reduce the insertion time, and to check that the new navigation pages of the system are made according to the standard designed and shared with the customer. In other words, the usage of a semi-automatic script for the creation of control pages of new stations will prevent the creation of new non-standard pages in the future.

3. Standardization of communication

The creation of a unified protocol for communication was a less evident aspect of this project, but one of absolute importance. We mentioned how the system is equipped with many types of sensors, supplied by different brands. Thanks to GE Vernova unique features, it was possible to aggregate individual communication protocols through a layer of transformation. One of GE Vernova's main prerogatives is, in fact, the ability to communicate with virtually every protocol available on the market. In this way, SCADA can communicate with any device on the ground, allowing it to overcome even the constraints of manufacturers who aim to propose their own software solution.

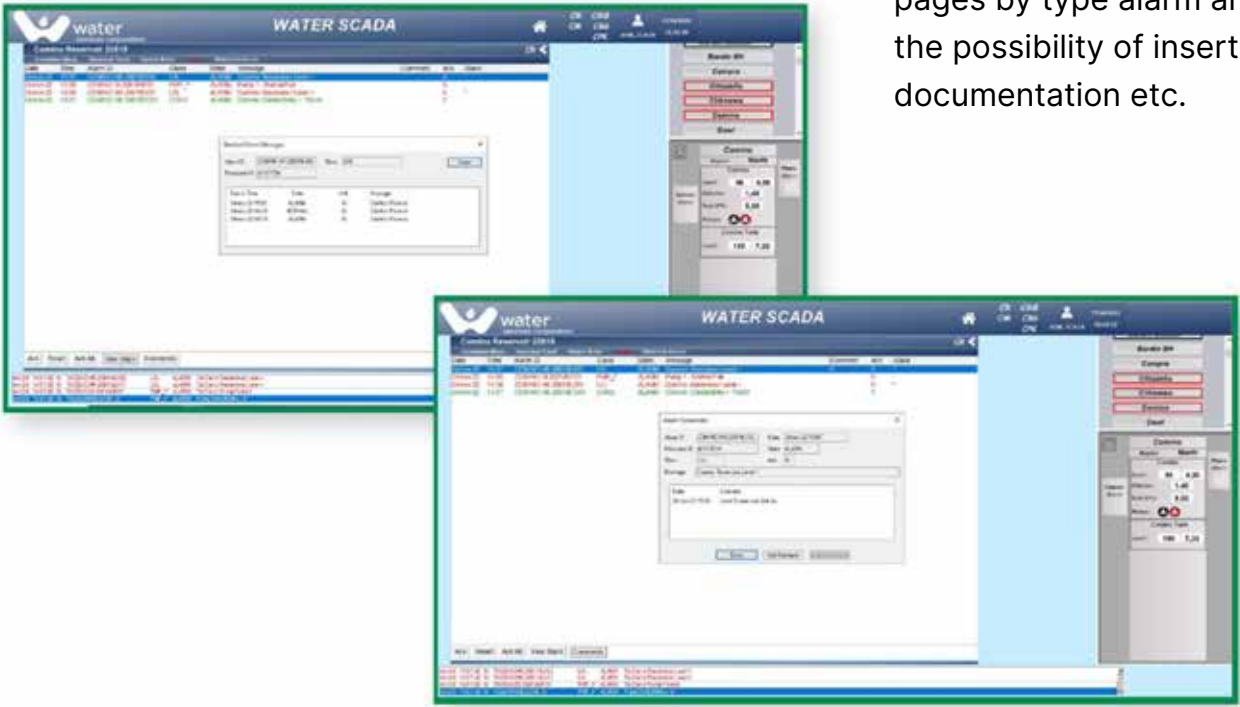


Time	Alarm ID	Alarm Name	Severity	Comment	Ack	Clear
10/10/2019 10:10:10	ALARM001	Customer Reception Unit - 1	High			
10/10/2019 10:10:10	ALARM002	Pump 1 - Malfunction	High			
10/10/2019 10:10:10	ALARM003	Customer Reception Unit - 2	High			
10/10/2019 10:10:10	ALARM004	Water Level - Overcritical Value	High			
10/10/2019 10:10:10	ALARM005	Water Level - Undercritical Value	High			
10/10/2019 10:10:10	ALARM006	Water Level - Overcritical Value	High			
10/10/2019 10:10:10	ALARM007	Water Level - Undercritical Value	High			
10/10/2019 10:10:10	ALARM008	Water Level - Overcritical Value	High			
10/10/2019 10:10:10	ALARM009	Water Level - Undercritical Value	High			
10/10/2019 10:10:10	ALARM010	Water Level - Overcritical Value	High			
10/10/2019 10:10:10	ALARM011	Water Level - Undercritical Value	High			
10/10/2019 10:10:10	ALARM012	Water Level - Overcritical Value	High			
10/10/2019 10:10:10	ALARM013	Water Level - Undercritical Value	High			
10/10/2019 10:10:10	ALARM014	Water Level - Overcritical Value	High			
10/10/2019 10:10:10	ALARM015	Water Level - Undercritical Value	High			
10/10/2019 10:10:10	ALARM016	Water Level - Overcritical Value	High			
10/10/2019 10:10:10	ALARM017	Water Level - Undercritical Value	High			
10/10/2019 10:10:10	ALARM018	Water Level - Overcritical Value	High			
10/10/2019 10:10:10	ALARM019	Water Level - Undercritical Value	High			
10/10/2019 10:10:10	ALARM020	Water Level - Overcritical Value	High			



ALARM

From a single «confusing» list to «filtered» pages by type alarm and operator with the possibility of inserting comments, documentation etc.



RESULTS

The collaborative path established has resulted in an efficient solution that has optimized waste and enabled efficiency. Here is what David Pace and Shaun Grima, ITSystem Architect and Operations Manager at the Malta Aqueduct, have to say about their experience.

1. Can you tell us about the project in its entirety?

This project consists of a new user interface for the current SCADA systems of WSC Malta. The user interface shows a graphical representation of the Maltese islands where the stations on high alert are shown. Over 500 external stations have been tracked geographically on the map. If one of the configured alarms is triggered, a pin on their location is displayed in red. The system also distinguishes the recognized alarms from those that just went off, changing the pin colour to green. By clicking on the geo-localization of alarm, a summary of the most important parameters of the station is displayed.



SIMPLIFIED NAVIGATION

To go down in detail of the single station simply click on the map. Then it is possible to further deepen by using the specific screen of each substation.



2. Where does the choice of revamping of the existing solution come from?

The existing user interface was designed over 5 years ago and besides wanting to update it, there were new ideas that the management wanted to implement. Furthermore, this update made the user interface faster and easier to monitor for the control room. The new system would also include smart alarms.

3. We know that GE Vernova is a historic choice for you: what are the main reasons for this long-term partnership?

GE products have always met our needs. In addition, they can connect to components of different brands, and this is an advantage, given the nature of our company.

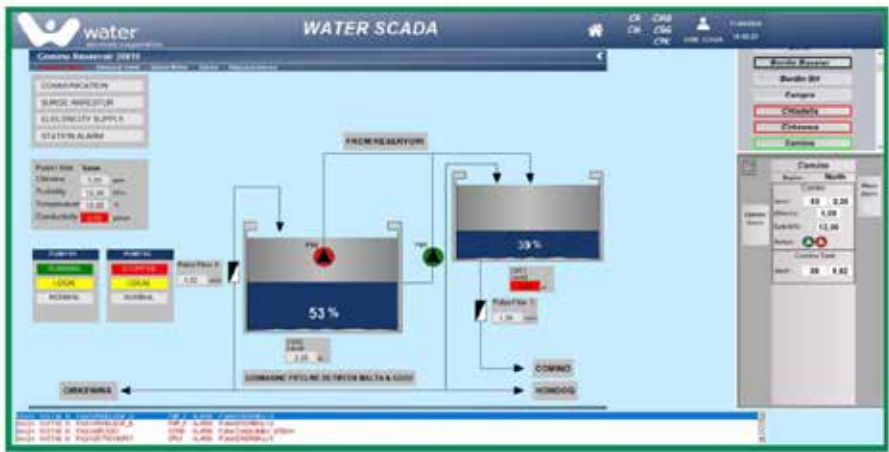
4. What expectations did you have from the partnership with ServiTecno?

ServiTecno has always been very professional and willing to collaborate with us. Having discussed our needs before agreeing on the objectives of this project, we were confident that it was possible to achieve the results we had set ourselves.



SUBSTATIONS

Small changes have been made to the graphics (so as not to disturb excessively the operators), such as the insertion of KPI and the navigation bar in the right hand of the interface.



The future of the collaboration

Enabling Malta Aqueduct to achieve efficiency and reduce waste through the revamping of the existing SCADA system has been a fascinating and challenging project in the context of a solid collaboration. A collaboration that will proceed immediately with the second phase, before consolidating along lines of action that are related to GE product management.

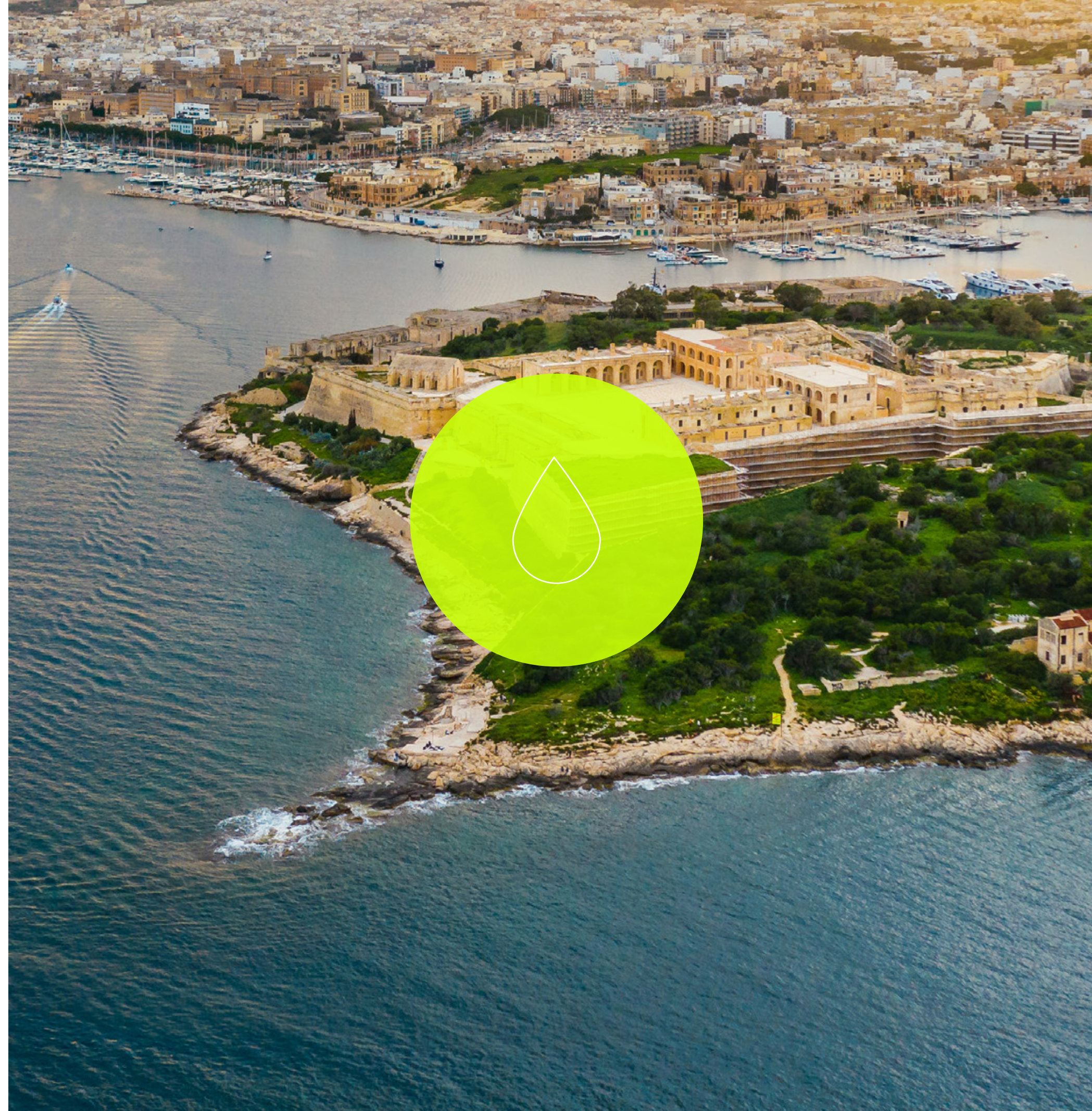
ServiTecno will continue to provide assistance on the installed GE systems: in fact, this was the origin of the working relationship that led to the involvement of the company in the project. ServiTecno, always in the perspective of ordinary management, also takes care of the technical alignment of systems, including the periodic updating of products and their routine maintenance.

Achieving efficiency through a pragmatic approach

The revamping of Malta Aqueduct's SCADA system teaches how, in most cases, approaching a complex project means to go back to the basics and take advantage of the experience gained over the years. A pragmatic approach, indeed, in which the success comes mainly from the consistency of the method applied, from the ability to gather information and to plan the processes. This was also made possible by ServiTecno's knowledge of GE Vernova systems and by the willingness to collaborate with Malta Aqueduct staff, who immediately shared the objectives and expectations regarding this implementation.

About ServiTecno

ServiTecno specializes in the supply of software and hardware for supervisory systems and management, providing 360° of process data within industrial and utility to support Digital Transformation.



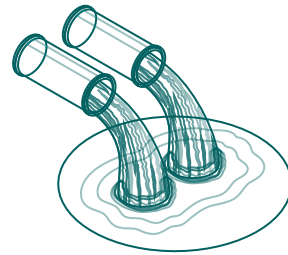
MEKOROT: HIGH AVAILABILITY, CONNECTED CONTROL SOLUTION VIRTUALLY ELIMINATES DOWNTIME



CHALLENGE

Mekorot, Israel's National Water Company, provides 70% of all water, and 80% of the drinking water for the country. Mekorot sought to reduce production costs through improved energy efficiency and tighter process control.

By leveraging GE Vernova's software and GE Vernova's hardware automation solutions (now available through Emerson), Mekorot is now using real-time data to automatically monitor and control devices from a single control room. This has created a connected environment in which minimal intervention by operational staff is required. Full redundancy was also employed to virtually eliminate downtime and to simplify controller backup.



BACKGROUND

In an arid climate such as Israel, water is an especially valuable commodity. Frequent droughts and a dramatic increase in demand have made securing a reliable source of high-quality water a national priority.

Lake Kinneret, also known as the Sea of Galilee, is a key source of water for the Mekorot system. To improve the quality of the water pumped from Lake Kinneret and address Israel's decades-long water shortage, Mekorot built a state-of-the-art filtration plant controlled by GE Vernova's state-of-the-art high-performance automation solutions. The Central Filtration Center at Eshkol in Northern Israel is currently the only one of its kind in Israel, and one of the largest in the world.

Lake Kinneret is 212 meters (695 feet) below sea level, so most of the water filtered at the Eshkol plant is pumped 152 meters (498 feet) above sea level, and then flows through pipes and open canals to the Eshkol Site. At the plant, it is treated and filtered before being distributed to urban, industrial, and agricultural customers.



"We aim to achieve high energy efficiency and process efficiency, so that we can facilitate cost reduction in the production of water. To achieve this, we have to leverage operations support systems and programming tools, which enable real-time decision-making. The GE control system at the plant performs automatic monitoring and control of the devices from a single control center."

**— Nuriel Meraro, Command & Control Engineering
Manager of Mekorot's Jordan Valley Division**



SOLUTION

During the filtration center’s planning and construction, Mekorot worked with GE Vernova's channel partner General Engineers, which specified and provided GE Vernova solutions to control and monitor the plant.

Mekorot chose GE Vernova's process control products for their ability to meet three critical customer needs:

- 1. Efficient, connected operation with fewer shifts and personnel
- 2. High availability
- 3. High and proven reliability

Simplifying operations

GE Vernova's automation solutions monitor and manage the Eshkol plant from a single control center. Dozens of monitors visualize and track the plant’s systems with minimal intervention from operational staff, dramatically increasing operational efficiency and minimizing costs.

Securing water

As a critical system, the Eshkol filtration plant operates 24/7, except once a year, when water flow is stopped for maintenance and upgrades that can’t be performed when water is flowing. Otherwise, GE Vernova's control system allows upgrades to the system while in process, allowing Mekorot to maintain a steady flow of water to its customers.

The control system installed at the Eshkol Filtration Center features the PACSystems High Availability solution (now available from Emerson), which provides true redundancy and enables full backup of the controller. The control and monitoring system has identical modules which work independently, and have full backup to help ensure the continuous and reliable operation that is of critical importance to Mekorot. Operations support system and programming tools enable real-time decision-making.

The system features 7 pairs of PACSystems RX3i controllers, controlling 6,000 I/O points with redundant architecture at all control layers—I/O to end devices, controllers, and HMI system. It is wired with fiber optic cables to ensure the fastest failover communication.

GE Vernova's CIMPLICITY HMI/SCADA software monitors the control system. The software was customized to the requirements of Mekorot, enabling optimal control of all facets of the filtration processes.

“PACSystems controllers along with [GE Vernova] CIMPLICITY HMI/SCADA system provide the highest flexibility in their implementation, as well as cost reduction for the end customers.”

— Hertzal Perry, Technical Manager for Control and Communication Systems of General Engineers

BENEFITS

With hardware controls and GE Vernova's software solutions, Israel National Water Company met its goals for the Central Filtration Center:



High availability

The plant runs 24/7, even during system upgrades



Increased efficiency

The connected plant can run with fewer shifts and personnel than similar-sized operations



Reduced cost

Less unplanned downtime and greater operational efficiency has reduced operational expenses



High reliability

True system redundancy enables continuous operation

Building on the success at the Eshkol Filtration Center, soon additional screens will control and monitor the plant's sludge treatment process. This process cycles sludge created by the filtration process back through the system, saving water, enhancing the overall efficiency of the water filtration process, and reducing costs.

"Mekorot faced challenging targets in the last seven decades of the Israeli water market. We feel proud to be part of turning these challenges into reality with our advanced solutions and our engineering expertise."

— **Zachi Stromza, Automation and SW Solution Division
Manager of General Engineers**





GE VERNOVA

MIDDLESEX COUNTY IMPROVES OPERATIONS WITH HMI/SCADA MOBILITY



BACKGROUND

Middlesex County Utilities Authority (MCUA) is committed to maintain the pristine beauty of the Raritan Bay by providing wastewater treatment services for industrial, commercial, and residential users in Middlesex County, as well as several municipalities in Union and Somerset counties. MCUA is the second largest authority in New Jersey with average flows of 100 million gallons a day with a peak of 450 million gallons daily.

Visualizing the Plant for Informed Decisions

MCUA chose GE Vernova's iFIX HMI/SCADA software to help their operators visualize the plant, providing them with an intuitive graphical interface to see the process and help them make any necessary operations changes. MCUA asked that the graphics in the GE Vernova software interface look like the actual plant,

so their operators see equipment similar to what is on the floor, helping them visualize and understand the process.

Getting real-time, accurate data to MCUA operators helped them determine how to best operate the plant in a streamlined process.

GE Vernova's iFIX provided MCUA with tools that are expandable and easy to set up. They were able to take advantage of the out-the-box tools and easy customization. MCUA embedded video cameras into their iFIX system, so they didn't need to leave the HMI/SCADA environment for increased visibility.

Reporting is also important to MCUA, along with Proficy Historian and the Excel add-in. Their complete SCADA system provided them with the reporting, integration, and security they needed.

"For us, the mobility is giving the administration the ability to see our flows and our data from anywhere. If the operator needs help making a decision, you can go on to your tablet or phone and see the information and assist them with their needs."

— Kevin Davis - Process Controls Engineer,
Middlesex County Utilities Authority

[WATCH VIDEO](#)



Products

- iFIX
- Proficy Operations Hub
- Proficy Historian
- Dream Report for Proficy

Results

- Visualizing the plant with an intuitive interface for improved operations
- Accurate data for informed decisions
- Real-time operational intelligence
- Increased visibility and productivity

About AutomaTech

[AutomaTech](#) is a leading provider of industrial technology solutions focused on improving your operational performance. By harnessing the power of data, we enable significant gains, visibility across your entire organization, and increased profits for a competitive edge. Our product offering includes a flexible and scalable mix of hardware and software solutions to solve your toughest challenges while providing a roadmap for future improvements and growth.



NEW KENT COUNTY PUBLIC UTILITIES KEEPS “AHEAD OF THE GAME” IN SCADA TECHNOLOGY



FAST GROWING COUNTY

New Kent County Public Utilities serves one of Virginia's fastest growing counties.

The public utility operates 10 well systems and a treatment facility with a 2 million gallon-per-day capacity. It has 3,900 water customers and 2,000 sewer customers.

As the county's population grows, so have the capabilities of its iFIX SCADA system.

"We try to stay ahead of the game, so to speak, and try to keep everything viable and working properly," says Harold Jones, Operations Superintendent at New Kent County Public Utilities.

GE Vernova partner [GrayMatter](#) works with New Kent to assess and develop its SCADA system to improve communication between facilities, enable remote monitoring, and help operators visualize critical, real-time data.

SCADA Assessment

GrayMatter's SCADA Assessment offering focuses on four key areas and assigns a score of 1 (lowest) to 10 (highest) to give an overall view of SCADA capabilities:

- Technology Utilization
- Screen Optimization
- Product Versioning
- Backup & Recovery

"I use the SCADA system quite a bit. It's an everyday part of my life, even on Saturdays and Sundays it's one of my checks just to make sure the heartbeat is what it should be."

— Harold Jones - Operations Superintendent
New Kent County Public Utilities

WATCH VIDEO

Jones, who has worked in water/wastewater for 23 years, said work to add capability to its SCADA system continues.

"Starting in July, we'll be going through several upgrades, starting with iFIX, WIN-911 and several other programming issues with our servers," he explained.

About GrayMatter

[GrayMatter's](#) goal is to transform operations and empower people. Since 1991, we have been helping some of the biggest industrial organizations in the world harness data so they can work smarter. They lean on us to secure their critical systems and connect their industrial assets to their teams so that every operator is empowered to be the best operator. GrayMatter has been on the Inc. 5000 fastest-growing companies list for six consecutive years and has grown to provide Advanced Industrial Analytics, OT Cybersecurity, Digital Transformation and Automation & Control services to clients in CPG, energy, food & beverage, manufacturing and water/wastewater industries across the U.S. and Canada.





GE VERNOVA

ORLANDO UTILITIES COMMISSION CREATES POWERFUL, INTUITIVE VISUALIZATIONS



Orlando Utilities Commission in Florida is transforming HMI/SCADA with centralized, intuitive visualizations

Orlando Utilities Commission (OUC), a long-time iFIX HMI/SCADA user, worked with GE Vernova partner GrayMatter to deploy Proficy Operations Hub to establish a user-friendly way for supervisors to get a real-time read on the system's status.

Leaders at OUC wanted a simple way to create customized reporting screens accessible via a view-only web interface.

Proficy Operations Hub offered the perfect solution, said James Alday, SCADA Coordinator for Water Production at OUC.

“We centrally manage everything here, so if we need outside sources like managers or upper management to view our data, it’s very important to have a method of allowing them to view that information without having complete control over our systems. That’s where Operations Hub came in for us.”

OUC took the most important parameters from its iFIX SCADA variables screen and organized them by plant in Proficy Operations Hub.

Variables included:

- Pressure
- Raw flow and treated flow (MGD)
- Ground reservoir level (PPM)
- pH and others

“Data is very important to us.”

— James Alday, SCADA Coordinator for Water Production, Orlando Utilities Commission

Any variables that are out of normal parameters are highlighted by a red box alarm, prompting operators or leaders to seek more info. Since building the variables page, OUC has also expanded its screen monitoring to treatment chemicals.

Big Wins



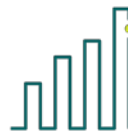
Strengthened collaboration & continuous improvement via mobile tablet and remote technology



Sped up reports to regulators and other compliance personnel



Flattened the learning curve for new operators because on-screen “widgets” display as relational gauges that provide context



Reduced the time and effort required to build custom reports and visualizations



Improved communication about time-sensitive operations with managers & non-technical leaders

Watch Video



About Orlando Utilities Commission (OUC) – The Reliable One

OUC—The Reliable One recently celebrated 100 years of providing exceptional value to its customers and community through the delivery of sustainable and reliable services and solutions. The utility provides electric, water, chilled water, lighting and solar services to more than 400,000 accounts in Orlando, St. Cloud and parts of unincorporated Orange and Osceola counties. As OUC prepares for the next century, it remains committed to its goal of achieving net zero carbon emissions by 2050 while supporting its community with conservation, sustainability and energy efficiency resources. Visit www.ouc.com to learn more.

About GrayMatter

GrayMatter's goal is to transform operations and empower people. Since 1991, we have been helping some of the biggest industrial organizations in the world harness data so they can work smarter. They lean on us to secure their critical systems and connect their industrial assets to their teams so that every operator is empowered to be the best operator. GrayMatter has been on the Inc. 5000 fastest-growing companies list for six consecutive years and has grown to provide Advanced Industrial Analytics, OT Cybersecurity, Digital Transformation and Automation & Control services to clients in CPG, energy, food & beverage, manufacturing and water/wastewater industries across the U.S. and Canada.



RACIBÓRZ WATERWORKS

Increasing efficiency and reducing risk with unified enterprise SCADA



Wodociągi Raciborskie is a water and sewage company based in Poland with a history that dates back to 1874. The company constantly invests in its development, providing customers with services at the highest level.

Faced with four separate SCADA systems, the company worked with GE Vernova partner [VIX Automation](#) to unify and standardize their automation. The company's investment included a unified SCADA system as well as standardized screens, redundancy, and remote access. The new solution features GE Vernova's iFIX HMI/SCADA, Proficy Historian and Proficy® Webpace.

With the modernized system and control room in place, results have included:

- 1 enterprise SCADA, replacing 4 separate systems
- 50% decrease in SCADA servers

- 24/7 reliability with industry-leading redundancy
- 1 database for archiving OT data
- Faster decision making and response, especially in crisis situations
- Reduced time and costs with standardized reporting
- Improved risk management
- Secure-by-design remote access for information and alerts anywhere, any time
- Ability to make decisions from the central control room without being at the on-site location
- Reduced training time for new employees
- More powerful and convenient ways to filter and analyze data
- Clear and transparent visualization
- Constant overview and supervision of the water

and sewer operations

Products

- iFIX HMI/SCADA
- Proficy Historian
- Proficy Webpace

Challenges with Four Separate SCADAs

According to Marek Kłaczyński, Automatyk, Wodociągi Raciborskie, Wodociągi Raciborskie established a Central Control Room years ago as well as SCADA systems. Unfortunately, although the SCADAs came from the same software provider, they were delivered and implemented by different companies, and created and updated according to the needs of the time, working on independent servers.

After years of these separate SCADAs, the team decided to merge and standardize them, which also provided an opportunity to modernize the control room.

[WATCH VIDEO](#)



Unified Enterprise SCADA

Sławomir Kubas with VIX Automation explained that the team has developed one common standard for the SCADA application.

“In the central control room, we had to deal with basically four separate, disconnected SCADA installations. Creating one common, well-connected and intuitive application that would control the existing processes was a priority for us.”

The new enterprise SCADA allows for much better visualization of the interdependence of the work of individual technological systems. Unifying the appearance of weather forecasts, and thus imaging data and technological parameters in a clear and transparent way, allows for much faster decision making in crisis situations. It also drastically reduces the training time for new employees. They used to learn four systems, now it's just one.

Reduced Costs with Less Hardware and Licenses

Marek Klaczyński, Automatyk, Wodociągi Raciborskie, explained that one of the goals was to organize the infrastructure – both physical and licensed.

“Now in the Central Dispatch Room we use 2 server licenses, one data archiver license and one remote access license, previously there were four separate servers. We also replaced the equipment, including servers, large-format monitors, UPSs.”

Redundancy for 24/7 Uptime

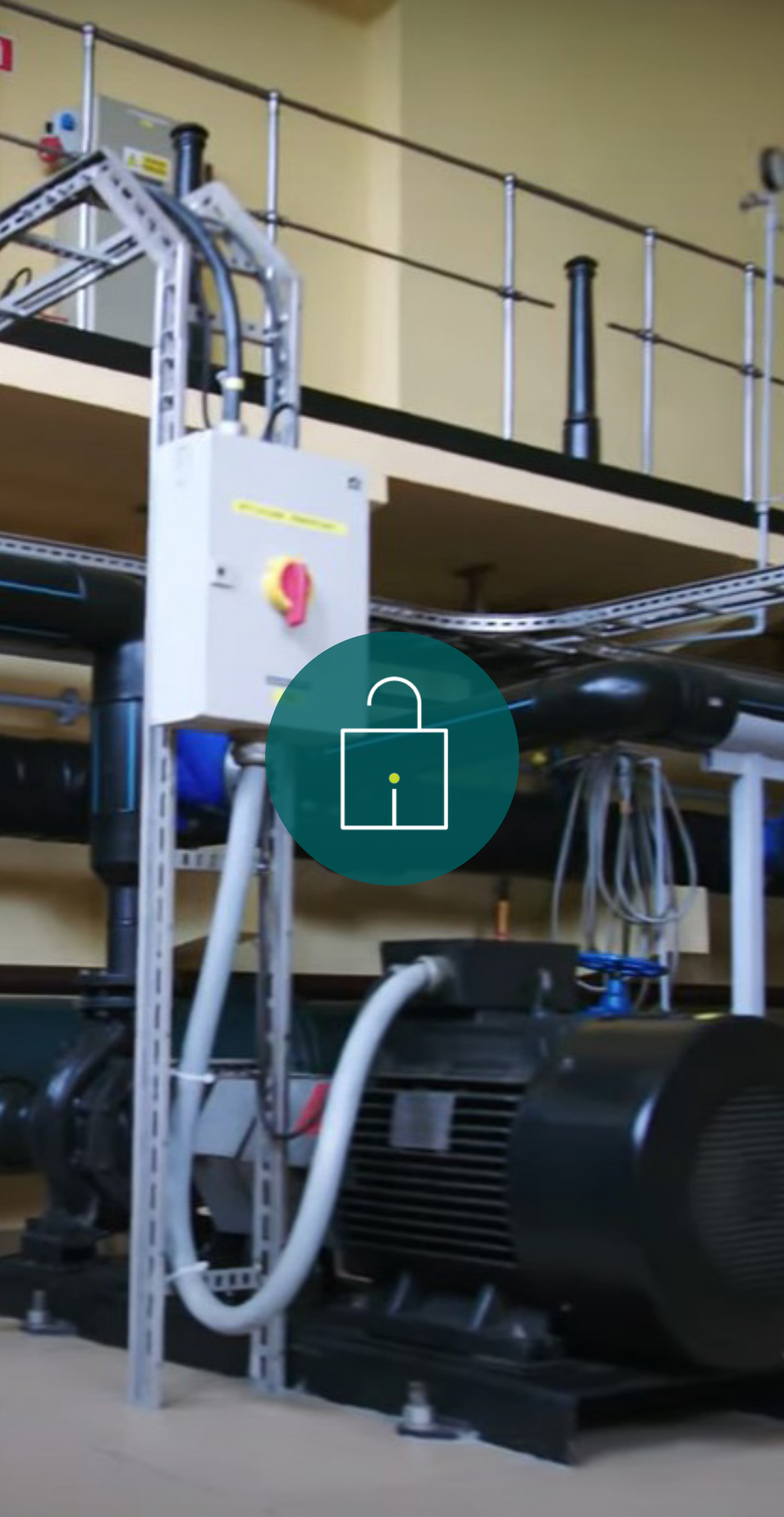
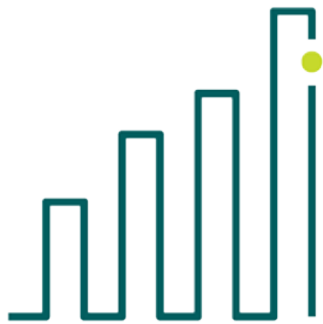
“What's more,” Klaczyński said, “the system works redundantly – thanks to which we can quickly restore the operating parameters of the devices in the event of a failure, and the failure of one of the computers or service work does not stop the system's operation. The system automatically switches between one server and the other.

“The ordering of the variables was also very important. The unified SCADA system now uses a single database (Proficy Historian), which enables continuous archiving of all data.”

Greater Ease of Use

“Thanks to these changes, we were able to recreate the continuity of the technological scheme - from extracting water from intakes to its distribution to individual areas of the city, up to the treatment of the resulting wastewater,” said Aleksander Pośpiech, Kierownik Działu Produkcji Wody, Wodociągi Raciborskie.

“Along with tidying up the data, we also managed to tame the alarm signals; they were divided into generic and object-oriented, which helps us in searching and segregating signals. A large number of variables now goes to one database, an independent archiving server. The data is now presented in a table that allows you to filter variables in many different, convenient ways.”





Enterprise-Wide Visualization

“Currently, Racibórz Waterworks in Central Control Room has and uses several groups of synoptic screens: water production technology, sewage system, power supply and sewage treatment plant,” explained Mateusz Glanowski with VIX Automation.

“Each of these groups contains several synoptic screens that collectively present individual elements of the installation. Originally, each group was presented on a separate computer station. However, data from different groups often overlapped. The current solution allowed to collect data from various installations into one whole.”

Faster Response with Remote Capabilities

“The system is constantly being improved by us and experts from VIX Automation,” Pośpiech said. “After conducting the pilot, we decided to implement the Proficy WebSpace solution, i.e. a desktop and mobile client for solutions from the GE Vernova family.”

“The application has access to all synoptic screens, they can be managed remotely and safely. In times of crisis, we quickly make decisions without being on site, in the central control room.”

Consistency Across the Enterprise

“Recently, the SCADA system from GE Vernova is also present in the wastewater treatment plant. We have introduced a system there, maintaining the synoptic standardization known from the Central Dispatch Room, which makes it much easier for us to manage this facility,” said Marcin Węgrzynowski, Kierownik Oczyszczalni Ścieków, Wodociągi Raciborskie.

“Naturally, we use good practices that we have implemented earlier – iFIX works redundantly here. Analogically to the scheme known from the central control room: data is collected in one industrial Historian database and shared in WebSpace. This place can also be viewed from the Central Dispatch Room. Thanks to this, we have a constant overview and supervision over another element of the municipal water supply system.”

Improved and Standardized Reporting

“We have also prepared specific reports for Racibórz Waterworks according to previously defined requirements and needs,” Glanowski explained.

“All with a uniform appearance and standardized format. Reports and charts present data in a much better way, and they are also much more convenient to use at work.”

“Thanks to the unification of the SCADA management and visualization system, we save money but above all time!”

— Aleksander Pośpiech, Kierownik Działu Produkcji Wody, Wodociągi Raciborskie

Saving Money and Time

“Employees learn the new system faster, we respond to critical alerts faster and manage risk better. In this way, we consolidate knowledge about water and sewage management in our city.

“In addition, the system works more securely, without downtime, and remote access helps us make key decisions without having to leave the desk. We work better, safer and more efficiently.”

Partnership with Cooperation and Trust

“We entrusted the care of our applications to experienced engineers who know iFIX inside out,” Kłaczyński concluded. “We knew that they had many successful SCADA installations in water and sewage companies. The development of our applications and subsequent instances are proof of good cooperation and trust we place in our business partners.”

About VIX Automation

For many years VIX Automation has been providing software and services for the industry, always taking care of every single detail of the product delivered, adapting it to your needs. For 15 years we have been a distributor of SCADA systems, especially iFIX, part of the Proficy portfolio, and other GE Vernova products. As a leader in the automation market, we make a real contribution to the increase in effectiveness of Polish enterprises.

RIVANNA WATER & SEWER AUTHORITY

Speeding performance with modern, thin client technology



Long-time CIMPLICITY HMI/SCADA user, Rivanna Water & Sewer Authority in Virginia is using Proficy Operations Hub to gain a foundation for insights into operations and productivity, a critical step in the journey to digital transformation.

[Rivanna](#) is a respected environmental and industry leader in the region and uses advanced technology and processes to achieve high standards of performance.

Challenges

- Lag related to web client
- Accessibility of data for trending and analysis

Results

- Faster trending and analysis
- Mobile for information anywhere, anytime
- Modern, thin client speeds performance
- Connectivity to operational and business systems for a single view to information and better decision making

Products

- CIMPLICITY HMI/SCADA
- Proficy Historian
- Proficy Operations Hub





GE VERNOVA

SABESP MODERNIZES SCADA USING IFIX AND REMOTE DESKTOP PROTOCOL (RDP)

- 4 Million Water customers
- 22 Water and sewage treatment stations
- Improved efficiency
- Faster response



INTRODUCTION

Company

Sabesp, São Paulo, Brazil

Products

- iFIX HMI/SCADA
- Proficy WebSpace



Modernization at Baixada Santista Business Unit

Sabesp is the fourth largest water and wastewater company in the world, responsible for assisting more than 27 million people in 373 cities in the state of São Paulo, the richest Brazilian state. Baixada Santista Business Unit is responsible for the services at 9 cities in the south coast of the state of São Paulo, assisting 1.8 million residents and up to 4 million people including tourists during summer season.

This business unit is developing a SCADA modernization project using iFIX, ThinManager and RDP protocol in a server-client architecture with 22 water and sewage treatment stations and one operational control center (OCC).

Also, the project aims to replace a legacy portal with Proficy WebSpace as the “OCC Portal” software tool and to implement Visual KPIs as a web-based tool for viewing Proficy Historian data in dashboards. The first tests using RDP in the SCADA architecture showed the need to upgrade the bandwidth of the Internet links used on the water and sewage treatment stations, so the system can function satisfactorily.

About the Speaker

Érico Soares Ascenção, Electrical and Automation Engineer, Sabesp

Érico Soares Ascenção is an Electrical and Automation Engineer with Sabesp, the fourth largest water & wastewater company in the world, being responsible for assisting more than 27 million people in 373 cities in the state of São Paulo. Érico holds an Industrial Automation MBA (PECE-Poli/USP - 2013) and Mechatronics Engineer (Poli/USP - 2010). He has nearly 10 years of experience in Electric, Industrial Instrumentation and Automation; working with maintenance, basic and detailed projects, development of automation systems (PLC and SCADA), commissioning and contract management in the following industries: chemical/petrochemical (Solvay), oil & gas (Petrobras), mining (Vale), cement (Brennand), nuclear energy (Brazilian Navy - CTMSP) and water & wastewater (Sabesp). LinkedIn

About Aquarius Software

Aquarius Software is a reference in technology, products and services for industrial automation and production management, with market-leading solutions and differentiated services, from the factory floor to the corporate environment. Continuously, Aquarius Software seeks the best technologies, mixes software and services with new approaches, creating many possibilities and innovations to provide a superior response to the challenges of each client. The Company has specialists in the areas of Automation and Operation Technology (TA / TO) and Information Technology (IT) and is able to accompany its customers on the journey of Digital Transformation.

THE CITY OF SAN LUIS OBISPO IMPROVES EFFICIENCY AND PRODUCTIVITY WITH IFIX



THE CITY OF SAN LUIS OBISPO

The City of San Luis Obispo's Water Department consists of five divisions that move water to and from the city. The divisions consist of a water treatment plant, wastewater treatment plant, wastewater collections, water distribution system, and a reservoir.

Challenges

Five divisions, five separate SCADA systems

The city was managing its water divisions in siloed systems that weren't capturing all the necessary data needed on how the water equipment is running. The systems also did not include any alarming or trending capabilities, so the city often relied on its customers to notify them of any issues.

Solutions

Standardizing iFIX for optimal plant processes



Results

Real-time monitoring for immediate operator response

The City of San Luis Obispo was able to increase operator efficiency and improve reliability, as it serves residents and businesses with clean, safe water with GE Vernova's iFIX HMI/SCADA solution.



SANASA REDUCES MAINTENANCE WITH 24/7 REMOTE ACCESS TO IFIX SCADA SYSTEM

- **High availability - 24/7 control and access**
- **Less maintenance - Centralized system management**
- **Lower costs - Flexible, economical clients**



INTRODUCTION

Company

Sanasa, Campinas, Brazil

Products

iFIX HMI SCADA

This is an excerpt of an [article originally published in Portuguese](#) by Carlos Eduardo Gurgel Paiola, Control and Automation Engineer, M.Sc., Aquarius Software; Alexandre Roberto Granito, IT Analyst / Process Automation, Sanasa - Society of Water Supply and Sanitation; Cláudia Souza Oliveira, Automation Analyst, Vale - Directorate of Ferrous Southeast - DIFS; and Diogo Lopes Gomes, Automation Analyst, Aquarius Software.

Background

Sanasa is the company responsible for water supply and sewage services in the municipality of Campinas in Brazil. Sanasa uses iFIX HMI/SCADA from GE Vernova for supervisory control and works with GE Vernova partner, [Aquarius Software](#). For remote access, Sanasa employs iFIX in conjunction with Microsoft's remote access solution, Remote Desktop Services (RDS), formerly called Terminal Services (TS). This combination facilitated the use of the supervision system, from operators to system administrators.



Overview

Remote SCADA access

All Sanasa process automation applications today use only GE Vernova's iFIX software as a SCADA system. As a result, the RDS Client remote access tool was implemented. The purpose of using the technology was to make it possible to integrate several SCADA systems into a single visualization and control platform, which can be accessed through Windows' remote desktop feature.

Before the implementation of the Remote Desktop Session Host (Server), now used with iFIX to control the entire process, two other technologies were used. One was characterized using ordinary customers, each with its own screens and its own licensing. It was a simple configuration and with great availability from customers, but with difficult maintenance of the system, considering the large number of client machines, which caused difficulties in managing licenses and changes in the application. The second way was to use a tool for converting screens to HTML, a solution that required a lot of work to correct the distortions that occurred in the operation screens, which required many hours of engineering.

Another advantage found in the use of RDS was the ease of installation and exchange of machines, since in the old operation solution (common customer) there was a need to install the supervision software on each machine, whereas in the current situation, the installation is only on the server. Taking the number of existing customers, which today total 17, the tool brought a great advantage to the company.

Remote Operation

The remote access tool via RDS with iFIX provides a real-time visualization of the process variables and allows the realization of a remote control with the process control elements, maintaining the reliability and security of the system.

The tool is used in Sanasa's CCOs (Operational Control Centers) in the raw water collection, water treatment, reservoir and treated water distribution sectors. In addition, this tool is also used in the sewage removal system, with the forecast to be used in sewage treatment units in the future.

Access is available to a wide variety of users, including management personnel and other work groups, such as the project sector group, which uses the tool to verify and analyze real-time data and historical data for the elaboration of new projects, which will be integrated into the existing system.

Through access to this information, it is possible to streamline the process of field survey and validation to fulfill the prerequisites of a new project.

In the case of system maintenance, it is also very useful to be able to access the SCADA system from any point in the Sanasa network, enabling changes to screens, databases and other system settings. The Sanasa network can be accessed locally or remotely (where access is made through a broadband ethernet radio link system).

Overview and Demonstration

Sanasa's implementation

Sanasa's automation system is extremely important for the operation of the water collection, treatment, reservoir and distribution system in the metropolitan region of Campinas. In this way, we can consider it as a system that requires high availability and that operates twenty-four hours a day, seven days a week. As a result, remote access to the supervision and control system (SCADA) is often required. This remote access is carried out via VPN between Sanasa and the remote connection point (for example: home), using a broadband link, or even a connection from a mobile vendor.

The RDS Client system has also been used in some events, to demonstrate the automation system and data acquisition system. At the ASSEMAE sanitation fair, a CCO was simulated in the middle of the booth, where the operating personnel of the water reservation and distribution system performed the monitoring and control of the Sanasa process in the event, through the definition of the set control and alarm points, remote activation of control elements, such as pump sets, valves, etc.

Conclusion

It can be concluded that the technology presented in this article makes the routine of the administrator of the supervision system very comfortable, since he/she only has one machine to manage. The immediate result is less time for system and application maintenance and control. In addition, there is also a reduction in equipment costs for the company, which only needs a good machine to be the application server.

At Sanasa, the use of the RDS Client platform with iFIX provided gains in TCO (Total Cost of Ownership or Total Investment Cost) because it is a license with a more affordable cost compared to the value of the same number of conventional customers.

In addition, there is a greater flexibility of setting the access level for each user of the system, which can be visualized, operated or even administered by the system, enabling application engineering.

Another advantage observed is that the server can be allocated in a data processing center, where it can share some other operational advantages, such as: use of automatic backup routines, better availability of the network, greater availability of bandwidth, power and adequate air conditioning, resulting in a gain in the useful life of the equipment and, consequently, an increase in the availability of the system.

Read the article "[Remote Operations of Mining and Sanitation Stations,](#)" by Carlos Eduardo Gurgel Paiola, Control and Automation Engineer, M.Sc., Aquarius Software; Alexandre Roberto Granito, IT Analyst / Process Automation, Sanasa - Society of Water Supply and Sanitation; Cláudia Souza Oliveira, Automation Analyst, Vale - Directorate of Ferrous Southeast - DIFS; and Diogo Lopes Gomes, Automation Analyst, Aquarius Software, originally published in Portuguese in InTech.



SOUTHEAST MORRIS COUNTY MUA OPTIMIZES WATER OPERATIONS WITH IFIX HMI/SCADA



DELIVERING SAFE DRINKING WATER

Southeast Morris County Municipal Utilities Authority (MUA) in New Jersey relies on GE Vernova's iFIX HMI/SCADA to monitor their operations and ensure they are delivering safe drinking water. They monitor roughly 32 locations of booster stations, pump stations, tanks, and motors, as well as water quality and chlorines. It is imperative that their SCADA system operate 24/7 and they can monitor water safety.

"Our SCADA system has always been an iFIX solution. What we like about the iFIX is that there is a large user base, and we feel very confident that it's a product that will be around for a long time. We enjoy GE Vernova's commitment to the product and all their improvements."

— **Nicholas Buono - IT Manager,**
Southeast Morris County MUA.

Long-Term Support for Utilities Automation

For over 30 years, Southeast Morris County MUA has used GE Vernova's best-in-class software support to maintain and support their software, and GE Vernova's trusted partner, Automatech has also provided technical support.

WATCH VIDEO

Products

- iFIX HMI/SCADA
- Proficy Historian
- Dream Report for Proficy

Next Steps

Southeast Morris County MUA is also planning for the future with a master IT plan to prioritize knowledge transfer for the next generation. With GE Vernova's suite of solutions, Southeast Morris Count MUA can document procedures and capture critical knowledge from the experts.

About AutomaTech

[AutomaTech](#) is a leading provider of industrial technology solutions focused on improving your operational performance. By harnessing the power of data, we enable significant gains, visibility across your entire organization, and increased profits for a competitive edge. Our product offering includes a flexible and scalable mix of hardware and software solutions to solve your toughest challenges while providing a roadmap for future improvements and growth.



TORONTO WATER KEEPS INNOVATING

1 billion liters of safe drinking water every day, safely treated wastewater, and stormwater management



THE PROCESS CONTROL SYSTEMS UNIT AT TORONTO WATER HAS A CRITICAL JOB AT ONE OF CANADA'S LARGEST WATER AND WASTEWATER PROVIDERS.

The roughly 30-member team supports the utility's SCADA systems, operational technology, and networking at Toronto Water, which treats 1 billion liters of safe drinking water a day.

The group also manages capital projects, day-to-day maintenance, contracts, licensing, upgrades, and standards enforcement.

Fully Automated

- Toronto Water is a long-time GE Vernova customer.
- GE partner [GrayMatter](#) provides support to Toronto for GE software products iFIX HMI/SCADA and Proficy Historian.

Recently, Toronto Water has taken on numerous capital projects to expand capacity and modernize existing systems. Those projects include:

- Implementing corrosion control and zebra mussel control processes
- Adding phosphorus removal to a treatment plant
- Installing lining in aging pipes
- Making emergency sewer repairs
- Carrying out water and wastewater plant upgrades

"We have a big system. We have 600 PLCs, maybe more, and eight big plants — four water and four wastewater — a distribution system and a collection system. All of them are fully automated and on SCADA"

— Zack Sayevich - Manager of the Process Control Systems Unit, Toronto Water



Partnership and Value

“GrayMatter has always provided value for us,” Sayevich said. “We’ve been working together since I became the manager in 2019, and they’ve helped us understand and forecast our SCADA licensing requirements, ensure we get the necessary technical support and help us determine what we actually need.”

Aaron Knight, a GrayMatter solutions architect who lives in Toronto, said, “It has been a great partnership with Toronto. I try to help clients like Toronto see the big picture, identify what goals they’re trying to achieve, and then help them to identify the best technologies and tools available.”

Sayevich said he enjoys the work at Toronto Water.

“The people are great,” he said. “It’s good to be responsible for part of a public service, and the work is technical, so you’re always trying new things and technologies.”

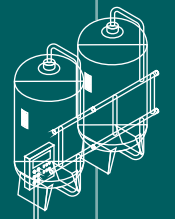
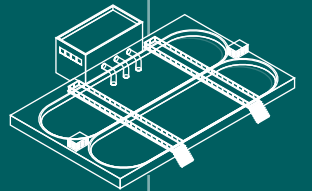
About GrayMatter

[GrayMatter’s](#) goal is to transform operations and empower people. Since 1991, we have been helping some of the biggest industrial organizations in the world harness data so they can work smarter. They lean on us to secure their critical systems and connect their industrial assets to their teams so that every operator is empowered to be the best operator. GrayMatter has been on the Inc. 5000 fastest-growing companies list for six consecutive years and has grown to provide Advanced Industrial Analytics, OT Cybersecurity, Digital Transformation and Automation & Control services to clients in CPG, energy, food & beverage, manufacturing and water/wastewater industries across the U.S. and Canada.



By the Numbers

- #1 largest city in Canada
- 1 billion liters of safe drinking water every day
- More than 3.6 million residences and businesses have access to safe drinking water, safely treated wastewater, and stormwater management
- \$83 billion in assets
- 8 treatment plants
- 18 pumping stations
- 11 underground reservoirs
- 4 elevated storage tanks
- More than 5,000 km of watermains
- 24/7 reliable service



VANDMILJØ RANDERS

Optimized IT Processes Management and Power Consumption



VANDMILJØ RANDERS

Challenge

- Replace aging HMI/SCA system
- Improve their way of working
- Optimize IT process management and power consumption

When Vandmiljø Randers (The Department of Water, Randers Municipality) decided four years ago to replace their aging HMI/SCADA system, they were not aware that the project would lead to both positive technical and personal changes.

“We deliberately sought to get away from the old way of working, and the decision to change our HMI/SCADA system was taken, among other things, because our old system could not be forced, by hook or by crook, to work in the new way. But neither of us had anticipated that the change would be so total and so positive for the whole company. And if I am to be honest, I am extremely proud of everything we’ve achieved so far”, says Michael Sønder Jensen, Production Manager at Vandmiljø Randers.

Action

- [Novotek](#), a GE Vernova partner, proposed iFIX from GE Vernova, a proven and innovative HMI/SCADA solution that enabled Vandmiljø Randers to generate all needed reports without manual data entry
- Provide the right tool to generate KPIs, improve decision making by being closer to the processes, and optimize processes

There are calculation tools installed in iFIX that can combine automatically logged and manually entered data in order to generate reports.

“We have received a solution configured so that we ourselves can generate all the reports we want, with or without manually entered data, and that option is worth a lot of money for us,” says Michael Sønder Jensen.

“For example, if we want to optimize the aeration in our tanks, we need to know how many cubic metres of water that run through the plant and how many kilowatt hours we use on our compressors. In less than ten minutes, iFIX can create a report that shows how many kilowatt hours we use per cubic meter of water, and in that way we can work efficiently to optimize that specifically.”

“Having acquired the right tool to generate the KPIs we need, enables us to see exactly what happens when we push the different buttons. In that way, we have moved much closer to the processes that we are responsible for managing and optimizing at Vandmiljø Randers. It is something that can really be seen on the bottom line.”

Result

- Increased efficiency of working methods and managing processes more effectively
- Optimizing processes continuously and reducing power consumption

“The shift to our new iFIX HMI/SCADA solution has in many ways been like moving from one reality to a new and better one. In our new reality, we get more good process optimizing ideas than we did in the old one. At the same time, the ideas are much easier to realize, which is not least due to our new HMI/SCADA solution.”

The list of benefits, efficiency improvements and new opportunities that Vandmiljø Randers has achieved with their new HMI/SCADA solution is long. Most importantly, however, iFIX has brought the employees in closer contact with the processes that need to be managed and, if possible, optimized.

“Our goals are now evident to everyone, and this has helped us to constantly improve and, among other things, continuously use less and less power”, says Michael Sønder Jensen.



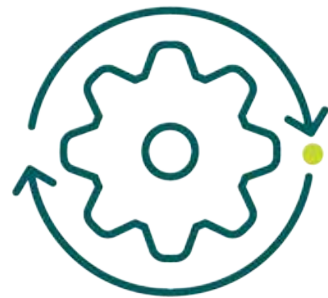
REGION OF WATERLOO

Streamlines Water System to Ensure Highest Quality



The Region of Waterloo is a regional municipality in Southern Ontario, Canada with a population of 535,154.

The Region's water supply system has more than 80 facilities and supplies water to seven communities the City's of Cambridge, Kitchener and Waterloo; and the Township's of North Dumfries, Wellesley, Wilmot, and Woolwich.



The Problem

The Regional Municipality of Waterloo's Water Services department is working with [GrayMatter](#), a GE Vernova partner, to develop and implement an iFIX SCADA upgrade program designed to modernize the Region's infrastructure and operating methods. In some cases, equipment manufacturers have phased out hardware or software. Other systems lacked industry-standard features or the ability to leverage best practices from industry standards bodies such as ISA. The Region pursued the project to maintain or improve regulatory compliance and provide water that meets the highest quality standards for its service area.

The Solution

The Region project team broke down all of the systems in the water division's SCADA environment, qualifying and prioritizing the most challenging tasks such as removing and replacing discontinued hardware components. Leigh McDermott, senior project manager at the Region, said the most significant enhancement has been the improved clarity and precision of the iFIX high-performance graphics HMI/SCADA screens.

BIG WINS

- **Standardized high-performance graphics**
- **Empowered operators to quickly act on data**
- **Anticipate significant reduction in training time for new operators**

WINS

"It is truly the interface to everything we do. We're really trying to streamline the way that all of our staff interact with our systems. GrayMatter has been involved in the screen development process from the start."

— Leigh McDermott,
Senior Project Manager,
Region of Waterloo

According to McDermott, the new high-performance graphic interfaces, which are in the process of being implemented, allow operators to quickly spot adverse or non-standard conditions in the water system.

Operators can intuitively navigate the SCADA system, understand the system's status, and most importantly see what is going on quickly. The HMI-SCADA screens are following the ANSI/ISA-101.01-2015, Human Machine Interfaces for Process Automation Systems Standard. Colors indicate an alarm and unique shapes can pinpoint a developing issue.

Examples of adverse conditions include: overflowing tank, high pressure in the distribution system, chlorine pump failure and high turbidity. Unique gauge styles are used to help create a familiarity with instrument types. Operators can recognize a parameter without needing colors or titles to identify them.

Over time, these efficiencies will produce significant savings for the system.



There are further savings to be achieved through the reduced time required to identify an upset condition in progress before damage or downtime ensues, not to mention reducing risks faced by the water supply system.

The new iFIX system configuration will also allow the Region to eliminate the redundant programming of local operator interfaces at their remote stations by using a single graphic repository and scalable thin clients.

All of the changes are intended to optimize and streamline the water system.

"We're standardizing the way we display data. It's working. We had an operator comment that they better understood what was going on compared to our original screens."

— Leigh McDermott,
Senior Project Manager,
Region of Waterloo



ABOUT GE VERNOVA'S PROFICY® SOFTWARE & SERVICES

GE Vernova's Proficy® Software & Services empowers teams, illuminating the path to a greener, more profitable future. Our proven industrial software accelerates innovation, enables connected workers, and operationalizes sustainability. We're driving measurable progress for over 20,000 diverse customers around the world.

The Proficy portfolio includes cloud-based and on-prem HMI/SCADA, MES, industrial data management, and analytics. Our software solves the toughest industrial challenges and is used in applications such as discrete, hybrid, and continuous manufacturing; utilities automation; metro transit; and much more. Proficy offers architecture flexibility including single machines, remote substations, and complex, distributed networks that span multiple factories and geographies.

[Explore Proficy Software & Services](#)

