City of Thunder Bay

www.thunderbay.ca

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Michelle Warywoda
Process Engineer, Bare Point

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Wonderware SCADA Solution Provides Ease of Use, Quick Payback and Expansion for New Water Treatment Plant

Goals
- Create an ultra filtration system to purify the city of Thunder Bay's water
- Provide safe drinking water while protecting the environment

Challenges
- Expand the daily capacity from 14 million gallons to 25 million gallons
- Integrate the existing pumping station with the new plant equipment

Solutions and Products
- Wonderware InTouch® HMI
- Wonderware ActiveFactory™ Software
- Wonderware Historian Software
- Wonderware SCADAlarm

Results
- ROI within two years
- Real-time reporting has enabled more effective regular maintenance for reduced downtime
- Historical trending reports have led to greater visibility and increased operational efficiencies

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Thunder Bay, Ontario – Located on the picturesque shores of Lake Superior, the City of Thunder Bay is a growing community. And since it was recently ranked as one of the top ten cities for business in Canada, population is likely to continue to increase from the 120,000 citizens who live there today.

Providing safe drinking water is a municipal priority. To do that, plus protect the environment, Thunder Bay set a goal to implement "lake to lake" water management. This means taking water from Lake Superior through the treatment process to the distribution system, and then back through the pollution control plant before returning it to the environment. In less than a decade, Thunder Bay has succeeded.

A New Plant with an Entirely New Process

To achieve "lake to lake" water management, Thunder Bay constructed an entirely new facility which is the first of its kind. While the previous plant used direct filtration with sand filters and disinfectants, the unique Bare Point Water Treatment Plant uses an advanced ultra filtration system to purify the city's water, while expanding daily capacity from 14 million gallons to 25 million gallons.

With an all-new facility and an aggressive timeline, the City of Thunder Bay called on Wonderware Canada East, the local Wonderware distributor and Canadian system integrator Automation Now to assist.

Challenges included integrating an existing pumping station with the new plant equipment as well as planning for future expansions. The initial facility had 12 PLCs, with 20 additional remote pumping stations to come that would incorporate PLCs from different manufacturers. Communications between the local PLCs and remote locations would be vital to the success of the project.

Wonderware Software was the Clear Choice

Without the ability to closely monitor and control this complicated system, the quality of Thunder Bay's water would be at risk. So it was critical to find the right SCADA (supervisory control and data acquisition) system – one versatile enough to meet the needs of the new facility plus its future expansion. Bare Point required accurate, real-time data gathering to ensure reliable control of the plant's equipment, regardless of location. Recording and logging the data, sounding alarms for threshold conditions and securely storing information were also priorities.

The new system needed to be easy to use as well as provide comprehensive reports for informed decision-making by management. After evaluating the options, the Wonderware solution was recommended and approved.

"Wonderware had the versatility and capabilities for the entire scope of the project in the future," said Larry Levchak, Manager with Automation Now.

The Bare Point plant is controlled by a Microsoft® Windows®-based system utilizing Wonderware Terminal Services software located in the operations center of the main plant. Redundant servers with UPS backup systems log over 5,000 points of data, 24 hours a day, 7 days a week.

The award-winning Wonderware InTouch® Human Machine Interface (HMI) software forms the core of the Bare Point solution. In the application design phase, it provided power and flexibility as well as connectivity for the broad range of devices in the local and remote plant locations. And now the InTouch software enables operators to closely monitor pumps and control valves, and its graphics enable them to visualize the water moving through the plant.

Working with the InTouch software, the Wonderware Historian provides a high-performance, real-time and historical database to integrate the operations center with the plant floor. As an extension of Microsoft SQL Server®, Wonderware Historian collects comprehensive Bare Point operating statistics while reducing the volume of data that must be stored. And it integrates this information with event, summary, production and configuration data. Its scalability is ideal to accommodate Bare Point's plan for growth.

For desktop-based analysis and reporting, Wonderware ActiveFactory™ software – part of the Wonderware ArchestrA® architecture – was designed in to the system. With the ActiveFactory software, Bare Point's process engineers can spot specific trends in real time plus prepare historical reports which can be exported to Microsoft Excel®. Simple point-and-click dialogs mean that plant operators can trouble-shoot problems and identify operational inefficiencies easily and quickly.

"It's very easy to use. I am able to pull whatever parameters I need into one trend and see how they're related and make better-informed decisions," said Michelle Warywoda, Process Engineer with Bare Point.

Significant Results in Record Time

Wonderware software and its intuitive interfaces made the design, installation and testing move forward rapidly. Once Automation Now was on board for the project, with support provided by Wonderware Canada East, Bare Point was operational within one year.

Today, engineers enjoy end-to-end control of plant processes. The easy-to-learn graphical interface enables employees in the operating center to see a real-time representation of the capacity of water moving through the facility, plus they can control the process and monitor error and fault codes from all of the PLCs. And when they leave the operating center, SCADA terminals throughout the plant enable access to the Wonderware system wherever they may be working.

Plant operators rely on Wonderware SCADAlarm™ as an indispensable tool for maintaining water quality. If an instrument takes a reading that is out of a pre-determined range, an alarm sounds – both on the SCADAlarm screen and a plant-wide alarm system.

Redundant servers secure plant data and store it for retrieval in the event of a failure. And the Wonderware Historian software's reporting capabilities enable management to maximize plant efficiency and accelerate expansion plans.

One of the unique features of the new Bare Point plant is its training facility. Instructors project live views of the operations, providing a highly productive environment for learning, group analysis and troubleshooting.

"Whether you've been working with Wonderware for one day or one year, the ease of use is the same for everyone. That gets everyone on the same page really fast. And that's important when you want to increase efficiency and run your plant the best that you can," said Mike Bazdarick, Supervisor: Water Treatment Plants with Bare Point.

Proper Planning Ensures Payback

Return on investment has come in record time. Real-time reporting has enabled more effective regular maintenance for reduced downtime. And historical trending reports have led to greater visibility and increased operational efficiencies.

But the biggest ROI is anticipated to come as remote stations are added. Automation Now expects that development time for these additions will be cut in half. This means that efficiencies will be realized during expansion and the money saved is projected to provide payback within the next two years.

With a forward-looking team and the Wonderware solution, the new Bare Point Water Treatment Plant has quickly established itself as a technologically-advanced and environmentally-conscious facility bringing clean water to Thunder Bay.