



CONSIDERABLE CHALLENGES AND TRANSFORMATIVE SOLUTIONS

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New Controller Brings Cloud SCADA to Existing Pump Controls & Other Operating Conditions

By Martin Hawrysko



Metro Monitoring Pro interface via MetroCloud connected device.



Metropolitan Industries announces the release of the Metro Monitoring Pro, a highly configurable controller providing the full experience of MetroCloud SCADA to water and wastewater applications. Perfect for scenarios such as PRVs, elevated tanks, and flowmeters, the Metro Monitoring Pro can log changes to data with precision accuracy thanks to its powerful DNP3 feature for receiving key information in real time. Not just for new installations, the Metro Monitoring Pro is able to be easily integrated into existing controls and make them MetroCloud Ready.

Equipped with 20 digital and 8 analog inputs, the Metro Monitoring Pro offers unlimited configuration options making it one of the most sensor accommodating controllers on the market. Each input has field adjustable scaling and alarm setpoints, allowing you to get more information from your system than ever before.

The Metro Monitoring Pro's user-friendly touch screen allows operators to view their system status when local to the panel while having full control capabilities to ensure operations stay intact. With the added options of custom input naming and the color selection of digital inputs, operators can customize their displays to work best for them.

Thanks to the Metro Monitoring Pro's affordable cost and ease-of-integration, a lack of resources no longer needs to prevent a municipality from adding full remote SCADA capabilities into their existing water and wastewater controls.

World Class Remote SCADA Integration
Is Easier Than You Think:

metrocloud.us/mmp



Access, Accuracy, and Health: A Hot Water Upgrade for Northwestern Medicine Delnor Hospital

By: John Bray

In a healthcare setting, the margin for error is slim. Everything must work as planned right when it's needed, meaning every system needs to function flawlessly. This applies not only to the systems related directly to patient care, but also to the systems that support routine, daily facility operations.

With more than 600 specialists working across 80 specialties in Chicago's western suburbs and beyond, the staff at Northwestern Medicine Delnor Hospital are familiar with the importance of every one of these systems. Concurrently, building managers and operations teams understand that routine care and maintenance are necessary to keep everything running smoothly. Similarly, they know aging infrastructure comes with the territory and, over time, maintenance may no longer be the answer.

After years of managing an outdated and unconventionally designed hot water system in an extremely tight space, the hospital's water heaters were no longer reliably meeting demand. With maintenance not enough to correct the issue, a replacement was necessary. Sherman Mechanical out of Cary, Illinois, was tasked with coming up with a solution. Realizing that the existing configuration would complicate equipment upgrading and future servicing, Metropolitan Industries was brought in as the solution specialist to come up with a custom approach.

Improving Access to Improve System Life

The hot water system was located on an elevated frame. At 10-feet off the ground, a ladder was necessary for accessing, which made serviceability inconvenient and unsafe.

"Delnor did an admirable job with servicing despite the accessibility challenges," said Matt Brickey, commercial sales representative at Metropolitan. "Normally we find that routine maintenance has been neglected and often forgotten about, which shortens the life of the product and makes replacement a necessity sooner than normal."

Metropolitan personnel went on-site multiple times to assess the existing operation and to brainstorm ideas. "We took a systems approach to the redesign, rather than attempting to apply just any sized equipment," said Brickey. "We examined their system operation and came up with a solution that would reliably generate hot water and ease serviceability."

Metropolitan is in the unique position to design and manufacture custom solutions engineered to meet the unique specifications of a given application. That flexibility is what allowed us to propose a redesign that stationed two MetroTherm semi-instantaneous water heaters at floor level, making them easily accessible.

To further promote routine maintenance, each semi-instantaneous water heater comes standard with a clean-in-place port, eliminating the need to remove the bundle for cleaning. "With the accessibility to the clean-in-place ports, building crews will take the time to keep up with servicing," said Brickey.

“By replacing the heat exchangers,” said Todd Spane, Northwestern Medicine Delnor Hospital Chief Engineer, “the average temperature is about 142-145 degrees.” The main water is elevated at that high temperature to ensure its storing temperature doesn’t fall low enough to allow bacteria growth, such as legionella – an especially critical safety concern for a healthcare facility.

With the successful upgrade to the hot water generation source, the hospital identified additional hot water issues with distribution in hopes that Metropolitan could address. What began as a single upgrade became a “three-phase” hot water system upgrade.

Maintaining Temperature Adjustments for Safe & Reliable Delivery

The original system at Delnor relied on traditional thermostatic mixing valves. These valves have been a part of the plumbing industry for decades, but their design and overall simplicity often make them unable to safely handle today’s demands, especially on a larger scale. For a more precise and regulated hot water temperature control, Delnor transitioned to the MetroMix, our electronic mixing valve package.

The MetroMix is effective at mixing elevated hot water with cold water, even as building demand changes, ensuring that distributed hot water is comfortable and safe. The duplex MetroMix skid was prefabricated on a common frame with the piping and valves factory mounted and wired prior to delivery. The redesigned piping installation completed by Sherman Mechanical made the MetroMix skid accessible to the hospital’s operations crew, while its BACnet capability allowed for seamless tie-in with their building automation system for easy monitoring.

Finalizing the hot water system upgrade was a replacement of their domestic hot water return pumps. As with the rest of the existing components, the set of wall-mounted pumps had been very difficult to access, maintain, and balance within the tight space. Metropolitan constructed a return pump package that consisted of four variable speed return pumps on a prefabricated frame which arrived all mounted, piped, wired, and ready to install. Staying consistent with the rest of the equipment, the hot water return pumps are now easily accessible which allows for ease of required inspection and any future maintenance as needed.

“From the safety standpoint, the system is much easier to access. We can now rotate pumps monthly to ensure the same hour distribution evenly across the pumps” said Spane.



The MetroMix electronic mixing valve package arrived with the piping and valves factory mounted and wired. The duplex skid is accessible to the operation crew following a redesign of the piping installation.

Today, the digitized system at Delnor ensures precise accuracy and control while also easing maintenance. With safe and accurate water temperature distribution to every fixture, hot water is now a non-issue for the hospital’s staff and patients - exactly as it should be.



From Pumps to Piping: A New Pump Station for the Village of Homewood

Transition of Lake Michigan Water
Supply Complete with Addition of 52
Foot Long Prefabricated Booster
Pump Station

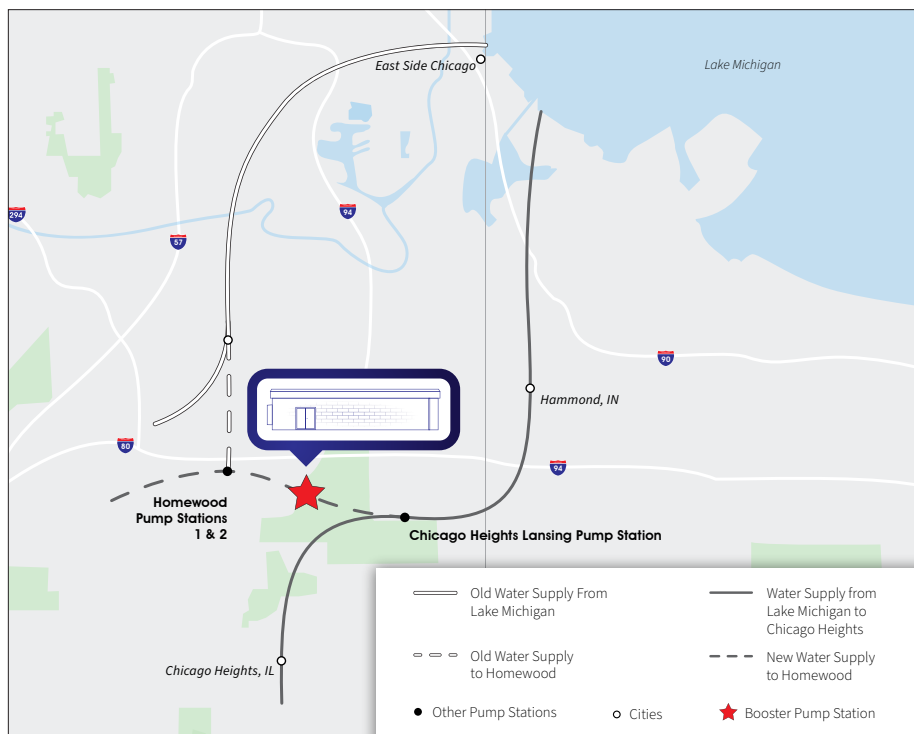
By: John Bray

Residents and businesses relying on municipal water know who's in charge of supplying that water. Some may even know where that water comes from within their community. But few people pay any attention to the processes involved in actually bringing that water from the source itself to the tap. An important part of that process is obviously water treatment, but before treatment can begin, that water must physically come from somewhere. Whether sourced from a well or a nearby body of water, it must make its way to the municipality. Sometimes, delivery is straightforward. Other times, such as when the village of Homewood, Illinois decided to change its water supplier, this process requires a bit more ingenuity — and engineering — to keep the water flowing.

Although the water source itself, Lake Michigan, remained the same for Homewood, the village wanted to switch suppliers to better serve their customers, and this change required added infrastructure. Homewood hired the team at Burns & McDonnell to make the transition as seamless as possible, and Burns & McDonnell reached out to Metropolitan. Along with our expertise surrounding the mechanics of water movement, Metropolitan's one-stop-shop approach made us the ideal partner for designing and building a complete solution for Homewood's evolving water needs.

A New Supplier for Chicagoland's "Greatest" Natural Resource

Many municipalities in and around Chicago, including Homewood, rely on Lake Michigan for their water. Homewood was not looking for a different source but needed to find a way to better serve their water needs while remaining cost-effective. To satisfy those objectives, Homewood decided to shift over to Chicago Heights, its neighbor five miles to the south, as its new Lake Michigan water supplier. This move meant the water would need to travel a bit further, and because of the demands already placed on Chicago Heights, a new booster pump station would be necessary to help complete the journey.



A Record-Breaking Pump Station

To say the least, Metropolitan is familiar with water movement. In fact, our designers and engineers have built pump systems to move water in every possible direction for municipal, commercial, and industrial needs. However, Homewood didn't just need a way to move water. They needed a brand-new structure to house the necessary equipment and support smooth operations going forward. So, we combined our pumping and mechanical equipment knowledge with our in-house fabrication capabilities and built the largest pump station we've ever created.

Measuring 16 feet wide, 13 feet tall, and a mammoth 52 feet long, the Homewood pump station is the result of months of design work and collaboration with Burns & McDonnell and a year of careful construction. Of course, that timeline includes more than the building itself. Along with constructing the two-room, fully custom, climate-controlled pump station entirely inside our Romeoville, Illinois headquarters — our teams were busy ensuring every aspect of the facility would meet Homewood's needs for

Top to bottom: below-ground pipe gallery, upper-level pump house interior, custom control panel providing MetroCloud SCADA.

years to come. Most of that effort went toward three separate areas:

1. THE PIPE GALLERY

Metropolitan's in-house fabrication team can customize just about any component in any size. For Homewood, this meant fabricating and powder coating the entire pipe gallery. Though the pipe gallery isn't always in the scope when we provide a prefabricated housed booster pump system, it's always been in our wheelhouse. Our fabricators carry all necessary certifications, and our welders are certified to ASME section 9.

2. CUSTOM FITTINGS FOR UNCONVENTIONAL PUMPS

Each of the 3 pumps in Homewood is capable of pumping approximately 5.5 MGD. Horizontal split case pumps offer both high capacity and high efficiency, making them ideal for this application, but they're also larger than other options.



Typically, this would mean a larger footprint for the pump house, but we looked at all options.

While the piping requirements were significant, we looked at utilizing an upper-level pumphouse with the piping gallery in a basement below the pumphouse. The 24" piping and valves of the water main connections were below, while the pumps' suction and discharge valves and piping connected the three pumps inside the pump house to the water mains below.

In part, constructing everything in our facility helped us reduce the size compared to in-field construction, but careful design and custom fabrication within the pump house itself were also essential. Placing the horizontal split case pumps at a 45-degree angle allowed them to fit in the 16-foot width of the space while remaining easily serviceable (which is always an essential consideration at Metropolitan), and producing our own fittings allowed us to reduce overall dimensions and exercise some creativity without requiring additional space. With design, engineering, and fabrication all coming from Metropolitan and completed to Hydraulic Institute (HI) Standards, this achievement was possible with minimal subcontracting, helping keep everything on schedule.

3. STATE-OF-THE-ART SCADA

Homewood's Supervisory control and data acquisition (SCADA) system was aging and antiquated, and it wouldn't deliver the control Homewood needed to support successful, long-term use of the new system. Our in-house U.L. Panel Shop gives us the capability to make custom control solutions tailored to end-users needs.

We modernized the SCADA and eliminated the need for additional onsite hardware by incorporating the MetroCloud platform. This dedicated cloud SCADA system provides Homewood with intuitive pump control capabilities and unmatched visibility into system operations including report generation and alarm notification. The cloud SCADA upgrade utilizes the latest in network security and private communication lines to ensure the safety of Homewood's vital data.

Thanks to the addition of a diesel generator, also supplied by Metropolitan, the entire system can remain online even when utility power becomes unavailable. When power failure is detected, the generator automatically supplies clean power to enable all functionality within the housed system quickly resumes.

The result of these efforts is a housed booster pump system that's so large it required all hands on deck when moving it out of our facility, a 100-foot trailer with hydraulics for transportation, and careful route planning for seamless arrival to its new home near the Thornton Quarry. With the help of onsite installing contractors, the eight pipe connections on the building joined as planned with the piping in the field (also built by Metropolitan), allowing for a true plug-and-play experience. The culmination of a year's worth of work was connected and ready for use, allowing for an expedited path towards startup.

Today, a 24-inch suction header, a 24" discharge header, a 24-inch flow meter, and 16-inch branch pipes leading to each of the pumps (including a third pump for redundancy) allow this pump station to meet the water demand needs for the village of Homewood and the customers they supply water to. When combined with ultra-low harmonic variable speed drives, an automated caustic dosing system, and round-the-clock system connectivity, this new system provides an updated and reliable water supply to the Village of Homewood and helps the municipality feel confident in their decision to switch water suppliers.



Metropolitan sees all projects through from inception to execution, this includes being on-site to assist with each stage of startup.



Expanding Our Reach with Northeast Expertise

By: John Bray

Today, it's difficult to find things that aren't connected to the internet. From vehicles and appliances to toys and TVs, everything seems to connect to something else. Sometimes, this can seem a little obnoxious or even unnecessary, but connectivity also serves an important purpose, even — or maybe even especially — in the world of water supply.

After the town of Schaghticoke, New York experienced an issue with their booster pump system and the lease line failed to provide necessary alerts, the importance of connectivity quickly surfaced. However, this unfortunate experience also presented two opportunities. First, it gave Schaghticoke a good reason to assess its water infrastructure and plan for necessary upgrades to the aging system. Second, it offered Emmons Metro the chance to demonstrate their capabilities with the MetroCloud system.

Emmons Metro, the Northeast wing of Metropolitan Industries, was formed in 2019 by our acquisition of Emmons Pump & Control. Emmons has over 30 years of expertise in bringing innovative quality products designed to provide the most optimized water movement and management solutions to our project partners and end users.

An Alarm That Failed to Sound

When a watermain issue led to low suction pressure within Schaghticoke's triplex booster system (a Metropolitan Industries design that's still running strong after 20 years), the pumps shut down, just like they're designed to do. The problem was that no one was notified of the issue. The dialer failed to connect and alert the operations team, delaying their efforts to make necessary repairs. A new modem and line were added as a quick fix in the short term, which gave the municipality time to explore a modern upgrade with more reliable communication methods for receiving notifications with additional access to real-time insights.

While the Illinois-based Metropolitan is used to crossing state lines to help customers across the United States, we also know there's value in a local presence. Local relationships go a long way, local service speaks volumes, and with Emmons Metro in Albany, New York, our definition of local has expanded to include New York state and parts of New England.

A History of Service and a Strong Local Name

Emmons Metro has been serving upstate New York and surrounding areas for over 30 years, meaning they've developed considerable expertise in the industry and strong relationships in the market. So, when the dialer failed in Schaghticoke, Emmons Metro got the call, and they were able to be on-site quickly to assess the issue and better understand the needed upgrades. Of course, because no two applications

are exactly alike and budgets needed to be sorted before work could begin, the Schaghticoke project still required a fair amount of up-front planning before new equipment could be installed.

As the team in Schaghticoke worked to secure funds from the 2021 Infrastructure Investment and Jobs Act., Emmons Metro worked with the Metropolitan team in Illinois to design a more modern solution while also remaining in close communication with the town should any unforeseen events occur. When it was finally time to change out the drivers with more modern equipment, Metropolitan was ready to assist as needed while Emmons' on-the-ground team was on-site and ready to work.

The project was relatively straightforward, but nothing is ever really a true one-to-one, in-and-out replacement. In this case, there were two small challenges that required workarounds:

1. First, the new control panel was larger than the old and had to be installed on the existing skid.
2. Second, the old system relied on an aftermarket flow meter that had been added to the original equipment after its initial installation. To bring that component into the new MetroCloud system, a custom program modification was necessary.

Fortunately, these challenges were identified in the design stage, and Emmons planned for its integration. When the system was brought online for the first time, however, the value of both a local partner and a reliable, cloud-supported notification system were thrust into the spotlight.

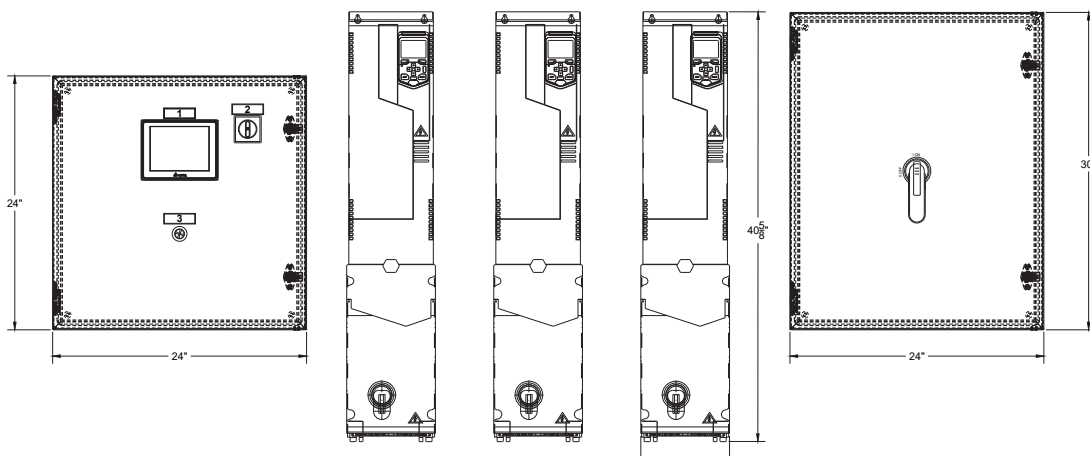
At startup, a check valve failed and MetroCloud, quickly detecting a suction issue, alerted the system. Having just upgraded from a failing dialer, this was an obvious improvement. Thankfully, because the Emmons team is local



Newly installed control panel and VFDs customized to fit with existing equipment.

and was on-site in Schaghticoke to ensure a smooth start, they were able to pull and clear two check valves and replace a third without needing to book flights or schedule a service call.

The entire experience left Emmons Metro fully prepared to sell, install, and service our MetroCloud platform. And, equally as important, Metropolitan as a whole officially realized what we've known all along: adding a Northeast arm to our growing company and expertise allows us to better serve our customers from coast to coast and everywhere in-between.



CAD drawing of customized panel components.

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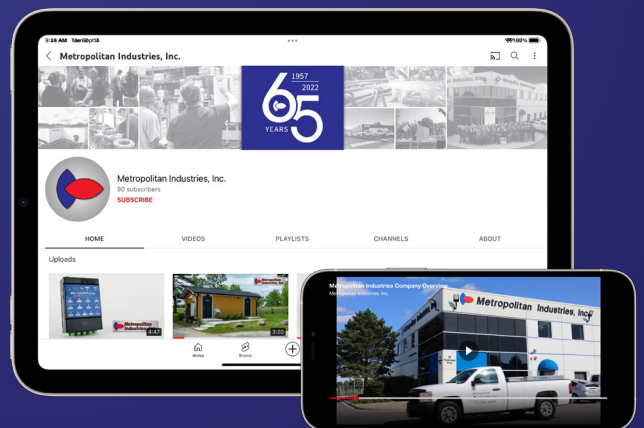
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We have a YouTube Channel that features project case studies, product overviews, and more!

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