



WINNING SOLUTIONS EVERY TIME

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Las Vegas Convention Center Hits The Jackpot With Metropolitan Industries

By: John Bray

Whenever anyone mentions Las Vegas, the first thing that comes to mind is The Strip. Lined with casinos, hotels, restaurants, and basically anything and everything you could ever ask for to keep you entertained for days on end, it's understandably a prominent feature. However, if you venture just a couple blocks off the main drag, you'll find the Las Vegas Convention Center.

At just shy of 2,000,000 square feet, it's one of the largest convention centers in the world and the nation's only convention center designated as a World Trade Center site. It hosts everything from international meetings and trade shows to sporting and special events for up to about 200,000 people. With numbers like that, and seemingly endless possibilities for the types of events the Las Vegas Convention Center can hold, day-to-day needs can vary considerably. This means that everything from electrical usage, HVAC demand, and water usage must be designed and built to accommodate heavy peak hours and off hours which typically happen on the same day.

When Environmental Systems Design (ESD) of Chicago, Ill. reached out to Metropolitan to design and engineer a booster pump system for the facility, we were up for the challenge. When we learned the project would require a system that could offer up to 2,300 GPM peak demand, we knew we'd be designing a large, multi-pump system. But it wasn't the peak flow that was the challenge; however, it was the exact opposite.

Out of State, in Our Comfort Zone

A system with a 2,300 GPM peak flow rate is a significant design on its own, but creating a pump system that would also function efficiently and smoothly at just a few hundred gallons per minute and less added a twist to the project. Our experience with large convention centers, sports arenas, hotels, etc. has helped us optimize water booster stations where flow ranges can change drastically.

We can build pumps and systems to handle just about any flow rate a customer may need. That doesn't mean, however, that every pump can handle the full demand range. For example, an 800GPM pump can easily move its capacity or its share, but that same pump was not designed for low flow and can face damage or failure if it runs too slowly for any length of time. With a steady eye on a rate that could meet all flow demands based on a performance curve, we engineered a 7-pump design that was flexible enough to handle fluctuations and smart enough to do so without anyone giving it a second thought.

Each pump is rated at 375GPM, allowing for reduced flow without risk of damage. Though the individual pumps are on the small side, there was nothing small about the system. If you have already run the math in your head, you've probably figured that out. Hitting a maximum flow rate of 2625 GPM, we designed in a bit of cushion to account for growth, one-off spikes or a pump being off for service. Even the suction and discharge headers clock in at massive 12", at least double the size of a typical booster system.

To keep everything running as smoothly as possible during different water usages, the system was complemented with the MetroTech III Pro. This customizable controller works round-the-clock to determine pump usage based on a set discharge pressure of 80psi. If one pump reaches 90-100% of its peak speed or if the pressure starts falling, the controller automatically calls another pump. The two pumps work in tandem, matching speeds to meet demands and minimize wear on any single pump, and the controller continues to bring pumps online until the full demand is met. Similarly, if pressure in the system is maintained and the running pumps slow down, the controller will shut them down one by one, naturally rebalancing the others. And, with a customizable MetroTech III, that's just the basics.

Our controllers, designed and manufactured in-house, offer complete flexibility and control of a system and include trend logs that display system, pump activity and behavior. There is also the added option for cellular data connection to provide remote capabilities to your team.

Customers who choose to integrate remote capabilities into their systems have a secure connection that allows them to monitor their system on any browser device from wherever they are and whenever they need. And much like THE city that never sleeps, our alarm notifications are also dispatched by this technology any time of the day or night.

This remote capability also eases maintenance and much like a tel-a-doc visit, can allow Metropolitan to work collaboratively with your team to troubleshoot issues before needing to dispatch one of our 24/7 field service team members.

And while these state-of-the-art features no doubt can create more efficiencies, it's also important to understand the risks associated with such technologies so risks can be mitigated right from the start.

Security and safety have always been a priority for Metropolitan and our remote systems use a multi-layered defense-in-depth approach to remote access along with other security controls to protect your water supply and end-users.

Communication and Commitment Regardless of Distance

Though we're proudly based in Illinois, we're no strangers to crossing borders and helping projects take shape in other states, too. Travel today does look much different than it did a couple years ago due to the COVID-19 pandemic that continues around the world, but that hasn't slowed the water movement industry and it certainly hasn't stopped us from bringing projects to life. Whether we're working a few towns over or across the country, we strive for open communication and a collaborate approach within Metropolitan and with every customer.

From our earliest conversations with ESD to designing, building, testing, crating and being on site in Las Vegas to bring the system on-line, every step was carefully planned and executed with final launch dates in mind. For the teams at ESD and the Las Vegas Convention Center, that meant a seamless process from start to finish. For Metropolitan, that meant our Field Services Engineer knew exactly what to expect while arriving on-site and manually testing each variable speed pump individually and tested the entire system for automatic operation. That's just business as usual. Regardless of how many miles may stretch between our headquarters and installation, we provide the same attention to detail, the same quality equipment, and the same commitment to ensuring everything we provide is exactly what you need (and probably a little extra, as well).



Top: The exterior of the Las Vegas Convention Center, one of the largest convention centers in the nation.

Middle: Installed Heptaplex booster system engineered by Metropolitan Industries.

Bottom: All our systems are custom-built, programmed, and tested in-house before arriving at the job site.

EMECOLE METRO RAISES THE STAKES WITH NEW 250 MIL CRAWL SPACE LINER

Our newest 250 Mil Crawl Space Liner, the thickest wall and floor liner on the market, is something no one else has. Designed with a true zero perm rating, this liner was engineered to stop the infiltration of moisture and soil gases, including radon.

With a double layer of closed-cell foam, the dual-sided liner is enclosed with heat-reflecting aluminum on one side and durable polyethylene on the other. And while its strength means it can withstand transporting and long-term storage, it's light enough to easily move during the installation process and between jobs.

Bring your customers one of the only solutions they need for the healthy and dry home environment that they're looking for.

250 Mil Crawl Space Liner Benefits:

- Protects home from moisture and soil gases
- Heat reflecting aluminum can help with energy-saving costs
- Rot and mold resistant even in a damp environment
- Puncture and tear resistant
- Easy to maneuver during the installation process



Before



After



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NO RISK, ALL REWARD: HOW METROCLOUD ADDRESSES SECURITY WITH REMOTE ACCESS SCADA

The Oldsmar Florida water treatment plant attack recently made national news when it disclosed that an attacker had attempted to taint the city water supply. While not all details have been made public, early indications suggest that a remote access application allowed the attacker to control the treatment plant's SCADA computer. Though these types of attacks are not new, the Oldsmar incident has once again put a spotlight on the security of remote access to SCADA systems.

As everyone in the industry knows, remote access is a reality in modern SCADA systems. Remote access provides operators the ability to monitor and control critical systems with limited staff from anywhere, at any time. Simply disabling remote access on these systems is not a practical option. Yet the problem remains that many of traditional SCADA systems were not built with the necessary security in mind to combat modern threats. That's where MetroCloud can help.

MetroCloud was built to be different. With MetroCloud there is no SCADA computer sitting on a desk in a treatment plant that is subject to power outages, equipment failure, flooding, or any number of physical threats. MetroCloud

lives in the cloud and was designed with redundant, secure remote access from its inception by a company with decades of experience in SCADA. To protect our customers from unauthorized access, MetroCloud uses a multi-layered defense-in-depth approach to remote access that ensures no single compromised set of credentials will give an attacker access to your critical systems. Here are just a few of the security controls that MetroCloud employs:

- Available Multi-Factor authentication that takes security beyond simple username and password credentials.
- Password protected VPN Access from PC and Mobile Devices.
- SCADA application access credentials specific to your users provides security and accountability.
- Lock Codes for PLCs and RTUS to protect sensitive system settings.

While cyber attacks on critical water and wastewater infrastructures remain an unfortunate reality, MetroCloud has been designed not only to keep you safe today, it has been built on a platform that can evolve to continue to keep your systems secure in the future. Even with a system as capable and secure as MetroCloud, system security is only as good as the weakest link. That is why design collaboration, proper system configuration, regular maintenance, and thorough operator training are all necessary links in the security chain.

The team at Metropolitan Industries – and our 60 plus years of experience in telemetry and SCADA – is here to help. Contact us today for a consultation on your current SCADA system. Together, we can ensure that we are doing our part in the continued preservation of our water supply.



Small Town's Giant Water System Quenches Needs of Neighboring Municipalities

By: Bob Wedell

In the western suburbs of Chicago lies McCook, Ill, a tiny town that was built on large industry. With a population of only 250, some might be surprised that it was once the home to some of the largest manufacturers in the last 100 years.

Electro-Motive Diesel - EMD (now owned by Caterpillar's Progress Rail Services division), which was at one time the largest employer in the State of Illinois, manufactured a variety of locomotives for railroad corporations in the country and worldwide. Other manufacturers such as ALUMAX (formerly Reynolds Aluminum), UOP, Vulcan Materials, who were also major producers of a variety of materials for the country, also called McCook, Ill their home.

As one could imagine, factories of these sizes required millions of gallons of water all day and every day to keep their facilities running efficiently and effectively. In fact, McCook, a long-time consumer as well as a customer of the City of Chicago's treated Lake Michigan water, had to have TWO connections for their water volume needs. Each facility

had the capability of pumping millions of gallons per day in order to meet the daily needs of McCook's system.

The early 1980s was the last time that McCook had invested much into the updating of their "lifeblood"—their water system. And while everything seemed to be status quo, the mid-1990s came with some unexpected changes.

These large factories, which had once relied on McCook and their water system for their freshwater needs, either relocated or downsized. And the once essential million gallons per day water system was now oversized and unfit for such a small municipality.

As Village officials started to hear more about local communities and the challenges they were having with their existing well systems, McCook saw an opportunity to shift their customer base from industrial to surrounding

municipalities. After all, re-selling water to these towns would create an opportunity to have a strong and steady revenue stream.

In 2018, Metropolitan Industries and the McCook Water Commissioner, Rich Paeth, started discussions about making improvements to the over 35 years-old pump stations. Paeth knew that the project would be a major undertaking and it would not be an all-at-once situation.

Water tower and welcome sign of McCook, IL.



Metropolitan recommended a staged approach, which in the past, had proven beneficial to many municipalities who had to rely on outside revenue sources to fund their water system improvement projects.

The stepped strategy that Metropolitan developed also addressed Paeth's hot items while creating an opportunity to replace obsolete items as the budget would allow.

The project, which began in 2018, started at the 39th Street pump station, a major connection to the primary water source. The pump station, which housed pumps that were over 30 years old, had one pump down and was in dire need of control upgrades.

The 200 hp vertical turbine pump utilized the 1960s "hydraulic clutch" technology for variable speed control of three of the four pumps at that station. Working with contractor partners, Metropolitan removed the first of the 200 hp vertical pumps and motors and existing starters and replaced them with a new Hydroflo pump, new 200 hp G.E.

premium efficient/inverter duty VHS motor, installed a new ABB variable frequency drive and rebuilt the existing 12" ClaValve control/check valve.

Next, the Village had their SCADA integrator reconfigure the system for the new VFD controlled pump and put the first pump online. From there, an annual upgrade plan was put into effect so that by 2020 three of four of the pumps and controls at the 39th Street pump station would be upgraded.

Starting in 2020 and continuing into 2021, pump and control improvements began being made at the 31st Street pump house/connection to Chicago's Lake water, as well as continuous improvements to the main distribution pump station at their five million gallons worth of reservoirs and water distribution systems.

Once 39th Street work is completed, McCook can continue to improve their second feed from Chicago and ultimately, they can finish "future" improvements at their main pump station and reservoir complex at

Egandale to an upgraded and updated system that will continue to operate reliably for decades.

Fully updating a water distribution system as it evolves from water supplier for local industries to regional water supplier for neighboring communities requires time and thoughtful planning. Metropolitan knows all too well that a steady approach to updating worn infrastructure can prove beneficial in the long run. And while the ultimate goal for Metropolitan and customers alike is to get them up and running on a best-in-class water system, fiscal responsibility and project feasibility are essential factors as well. Metropolitan knows it's the sum of all parts that makes a strong project.

Left: Before shot of McCook's 31st St Pump Station.

Right: 3 of 4 newly installed pumps for McCook. Metropolitan can work with municipalities to upgrade equipment as time and budget allows.



Potable Water Pump Upgrade Continues to Push Through Unforeseen Setbacks

By: Susan Gnirke

The surge of office campuses began in the 1950's. Post World War II era, many people were fleeing what was considered the overly populated and polluted city to find solace in the suburbs. In an effort to follow the white collar employees that companies were searching for, corporate campuses were born.

One such visionary to follow suit in New York was Governor W. Averell Harriman. His vision included a campus that would be more accessible for the state employees that were increasing by number as well as provide more space for parking. The campus eventually included the State University of New York at Albany (SUNYA) and now boasts over three million square feet of office space for over 7,000 state employees and 13,000 students of the university.

As one can imagine the critical potable water and wastewater management needs and designs have changed dramatically from over 60 years ago. Keeping up with the demands is costly, ongoing, and crucial. But progress is fluid, always moving, just like the water.

Emmons Metro, a division of Metropolitan Industries, was first approached by MJ Engineering and Land Surveying, P.C. in 2016 about upgrading the campus' potable water pump station. Based on conversations between Emmons and MJ Engineering and an understanding of the preliminary specifications, a pump selection along with the custom control panel theory of operation was made and brought to bid in 2018.

Unfortunately, issues with the building specified to house the equipment were identified and all bids were rejected. After a bigger building was selected, the job went back out to bid in June 2019 which brought with it new challenges.



Top: Completed upgraded potable water pump station at W. Averell Harriman State Office Building Campus.

Bottom: Crew and Subs responsible for making this project a success.



Left: Team leader Kim Emmons next to one of the newly installed pumps.
Right: New 6 Pump Variable Speed Control Panel with double door enclosure.

The volume of water that was being calculated for the new pump system was very high, even at resting hours. The original vertical in-line pumps that Emmons specified for the low flow service were discontinued due to new hydraulic efficiency standards by the Department of Energy. Unfortunately, the new replacement pumps from the same manufacturer met all criteria except for the minimum continuous stable flow (MCSF) requirement. Replacement pumps at a price level that was acceptable to all parties needed to be found.

With Emmons Metro's commitment to continuous collaboration with the engineers to identify what is needed for each project and the manufacturers to make it happen, Grundfos Paco VL series vertical in-line pumps which were approved and furnished for this project.

Another challenge according to Hal Bayly with Kingsley Arms Inc, the general contractor, was the pilings. The estimated depth for the project was 100' but for other projects on the campus, they had to go deeper. Luckily, the specifications were met and the 5,000 feet of pipe was laid efficiently.

When asking Hal what his most valuable resource on the project was, he noted "the crews and the subs" without missing a beat.

Despite harsh winters, geological unknowns, Department of Energy changes and a pandemic, the project was a success and finished ahead of schedule.

At Emmons Metro, we know the key for successful projects is found in the planning and the collaboration between all project partners. Kim Emmons, general manager of Emmons Metro, adds that one of our most valuable attributes is the ability to overcome and adapt. This mantra has served Emmons Metro and the rest of the Metropolitan Industries family well during our time in the industry.

Project partners and end-users will benefit greatly from Emmons Metro's years of experience.

To provide the best hydraulic solution to the various challenges that each project presents, we review several pump manufacturers' offerings to ensure the most state-of-the-art mechanical equipment, i.e., pumps and motors, is being used. Customers will also have the added benefit of a well-versed controls provider and expert design team with Emmons' parent company, Metropolitan Industries.

System owners will have peace of mind knowing the years of experience and the 24/7 field service capabilities of Emmons Metro were ingrained from the project's very beginnings for their water, wastewater, and stormwater pumping needs.

And while equipment and technology will no doubt change again, the potable water is now flowing without issue and ready for the SUNY campus to fill up again as well as the New York State office buildings.

Ready to Weather Any Storm

The threat of basement flooding due to sump pump failure is a reality any homeowner faces. So why not be ready with a solution that provides them the extra protection they need?

Sump pumps rely on house current so if the power goes out, which can happen during heavy storms, the protection homeowners once relied on is gone. Battery backup systems are like an added insurance policy that protects a homeowner's basement from flooding and their wallet from unexpected expenses.

Enclosed in a non-corrosive case with an average capacity of 77 GPM and the ability to switch from DC to AC, our battery backup systems are durable as well as dependable.

The Ion Technologies line of battery backup pump systems is a necessary add-on for all basements. Whether sump pump failure occurs due to general wear and team or due to a storm power outage, our collection of battery backup pump systems are ready to weather any storm.



Typical battery backup installation.



35ACi Deluxe

- (2) BA33i Pumps
- 1/3 HP • 68 GPM
- 12 Volt DC to 120 Volt AC



55ACi Deluxe

- (2) BA50i Pumps
- 1/2 HP • 78 GPM
- 24 Volt DC to 120 Volt AC



Sumpro Platinum

- (2) BA75i Pumps
- 3/4 HP • 85 GPM
- 2 Batteries for longer run times



For more Ion product offerings visit:

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Reliable and Intuitive Just Like Our SCADA Technology

We pride ourselves on designing equipment and controls that are easy to use for the end users. So why should our websites be any different?

Our recently updated MetroCloud website includes newly added case studies and demonstration videos that showcase the reliable, effective, and secure technology our Cloud SCADA solution offers.

Are you ready to upgrade all of your water monitoring & management capabilities?

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