

VILLAGE OF HOMEWOOD



BOARD AGENDA MEMORANDUM

DATE OF MEETING: November 12, 2024

To: Village President and Board of Trustees

Through: Napoleon Haney, Village Manager

From: Joshua Burman, Director of Public Works

Topic: Homewood Water Plant #1 System Upgrades

PURPOSE

A motor control center (MCC) is a centralized assembly that controls multiple electric motors in water plants. The motors are used to move water to and through the water plants. Motor Control Centers (MCC) enhance the efficiency, safety, and reliability of operations in water plants, making them essential for effective water management. The current MCC at Water Plant #1 is the heart of the water system, pumping 2.5mgd (million gallons daily) and controlling five (5) water pumps. The MCC is now 42 years old. The age of the system has led to increased maintenance costs, risk of failure, and safety concerns for staff.

The Public Works staff is able to perform much of the preventative maintenance required on the system, but due to the age of the MCC, parts have become obsolete and/or impossible to find. The maintenance challenges pose a significant threat to the efficiency and reliability of the water facility, potentially impacting water delivery to not only our community but those we service (Flossmoor and East Hazel Crest). Upgrading to a new *variable frequency drive* system (VFD) will improve the efficiency of our pumps and motors, allowing them to gradually adjust speeds to maintain system-wide pressure. Public Works is requesting the Board approve upgrades to the motor control center at Water Plant #1 using Metropolitan Industries, of Romeoville, IL in the amount of \$543,482.00.

BACKGROUND

What is a Motor Control Center?

In a water treatment plant, Motor Control Centers (MCCs) play a crucial role in managing the various electric motors that drive the pumps and equipment needed for the movement and distribution of water. Motor Control Centers provide the following functions:

Centralized Control: MCCs provide a centralized location for controlling and monitoring multiple motors that operate pumps, blowers, fans, and other machinery necessary for the water distribution processes.

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Automation: MCCs often integrate with automated control systems (like SCADA systems) to allow for remote monitoring and control of motors, facilitating operational efficiency and reliability.

Protection: MCCs protect motors from overload, short circuits, and other electrical faults through circuit breakers, fuses, and overload relays. This is crucial for the continuous and safe operation of water treatment processes.

Power Distribution: MCCs organize electrical power distribution to various equipment across the plant, ensuring that motors receive the necessary voltage and current while minimizing the risk of electrical failures.

Operational Flexibility: Operators can easily start, stop, and adjust the speed of motors as needed for different treatment processes such as filtration, aeration, and chemical dosing.

Components of MCCs in Water Treatment Plants

Motor Starters: Soft starters and variable frequency drives (VFDs) may be included to control the starting and running of motors smoothly, especially for high-torque applications like pumps. Variable frequency drives (VFDs) are frequently used in motor control centers because they provide precise speed control for motors, enabling significant energy savings by allowing motors to operate at only the required speed, which is especially beneficial in applications with fluctuating load demands, leading to improved operational efficiency and reduced energy costs.

Protection Equipment: Includes thermal overload relays, circuit breakers, and fuses to safeguard machinery against electrical faults.

Control Panels: Interfaces for operators to monitor the status of motors, set parameters, and respond to alarms.

Communication Interfaces: Integration with control systems to enable data exchange and operational monitoring.

Enclosures: Weatherproof or corrosion-resistant enclosures to protect electrical components from environmental conditions commonly found in water treatment facilities.

Pumping Systems: Used for raw water intake, treatment processes, and distribution to storage or directly to consumers.

Aeration Blowers: To add oxygen to aeration tanks for biological treatment processes.

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Chemical Feed Pumps: Used to accurately dose chemicals required for disinfection and coagulation.

PROCESS

To assess the current conditions of the facility, staff reached out to Metropolitan Industries of Romeoville, IL as they are the Village's primary contractor for professional services for all Village municipal stations (water plants, booster stations, sanitary sewer lift stations, and the storm water pumping station). The Public Works Department uses MetroCloud which has provided Supervisory Control and Data Acquisition (SCADA) software for years. SCADA is the system that monitors and controls water treatment processes by collecting, analyzing, and displaying real-time data. This software is integrated into all the water and sanitary lift stations for monitoring performance and alarms. Due to the critical nature of the planned system upgrades, which must effectively communicate with the SCADA software, collaboration with Metropolitan Industries is essential.

Staff conducted a thorough evaluation of Water Plant #1 with the Metropolitan Industries team to discuss the difficulties that the Village is facing due to the aging equipment. Additionally, upgrading to a new variable frequency drive (VFD) will improve efficiency of the Village's pumps and motors, allowing them to adjust speeds to maintain system-wide pressure rather than turning on and off as needed.

Why Metropolitan Pump?

Metropolitan Industries has a strong track record, boasting 70 years of experience in the industry. They played a key role in the construction of Water Plant #1 in 1982 and have been assisting the Village with system maintenance and improvements ever since. In consideration of their extensive history with the Village's infrastructure and the success of their most recent major project at Water Plant #3 in Thornton, staff is very confident in Metropolitan's expertise as it pertains to this project and future endeavors in Homewood.

Staff is requesting to waive competitive bidding according to the Village's purchasing policy for the following reasons:

- Proprietary Purchase - *Metropolitan Industries is a major industry leader in Motor Control Centers and are Public Works' go to for parts, equipment and repairs.*
- Equipment Standardization – *Metrocloud SCADA system is Metropolitan Industries proprietary software.*
- Manufacturer, Repair, and Authorized Dealer/Seller – *Metropolitan Industries have relationships with major manufacturers and dealers.*
- Technical nature of item makes competition impractical or will negate standardization
- Utilization of a vendor currently under contract or that serves as the Village designated vendor for system maintenance – *Metropolitan Industries is the Village's most reliable vendor as it relates to maintenance and repairs.*

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OUTCOME

Approval of this system upgrade will enable Public Works to replace an important water asset, increase efficiency, and ensure reliable delivery of water to our users. This upgrade will also address the safety concerns associated with the automatic transfer switch.

FINANCIAL IMPACT

- **Funding Source:** Water & Sewer Capital Fund
- **Budgeted Amount:** \$560,000
- **Cost:** \$543,482

LEGAL REVIEW

Not Required

RECOMMENDED BOARD ACTION

Waive competitive bidding due to a proprietary purchase, equipment standardization, manufacturer, repair, and authorized dealer/seller, technical nature of item makes competition impractical or will negate standardization, and utilization of a vendor currently under contract or that serves as the Village designated vendor for system maintenance; and, approve the system upgrades for Water Plant #1 from Metropolitan Industries of Romeoville, IL in an amount not to exceed \$543,482.00.

ATTACHMENT(S)

- Photo
- Metropolitan Industries Homewood Water Plant #1 Proposal