

Xylem Engages in Award-Winning Rehab and Bypass Project with North Carolina Utility

Godwin electric pumps meet EPA overflow standards with substantial cost savings for North Carolina utility

The Cape Fear Public Utility Authority (CFPUA) in North Carolina engaged in a capital improvement project to help address their aging infrastructure. The project was identified as the Northeast Interceptor Rehabilitation Phase 2 Project (NEI Rehab), which included the replacement of the ductile iron pipe (DIP) force main – susceptible to sanitary sewer overflows – between the Bradley Creek and Hewlett's Creek Pump Stations.

Solution

CFPUA hired State Utility Contractors (SUC) out of Monroe, North Carolina to manage and execute the NEI Rehab Project, a complex and multifaceted undertaking that ultimately won SUC the prestigious Carolinas Associated General Contractors Pinnacle Award.

The rehab project called for the replacement of approximately 5,140 linear feet of the 20-inch DIP force main. To make the pipe replacement possible, a 100% redundant sewer bypass system – capable of handling maximum peak flows of 13.5 million gallons per day (MGD) – was required. SUC brought in engineers from the local Xylem rental branch to work closely with SUC and Kimley-Horn consulting engineers to assess the complexities of the project and to develop a bypass plan.

There were three primary components of the bypass operation:

1. Two major pump stations
2. Eight smaller pump stations
3. Emergency back-up plan

To address the first component of the bypass plan, Xylem engineers recommended renting Godwin electric drive CD300M Dri-Prime pumps for the two major pump stations. They chose electric drive pumps to save diesel fuel costs during the seven-month project. Each of these Godwin pumps was designated as the primary bypass pump and equipped with a Godwin Variable Frequency Drive (VFD), allowing the electric pumps to change speed according to flow.



Bank of Godwin CD300M diesel driven pumps installed at one of the two major pump stations.

CUSTOMER: Cape Fear Public Utility Authority (CFPUA), North Carolina

CHALLENGE: Replace an aging force main sewer line that was susceptible to sanitary sewer overflows that required a 100% redundant sewer bypass system capable of handling maximum peak flows of 13.5 million gallons per day (MGD).

PRODUCTS:

- 2 Godwin Electric Drive CD300M pumps
- 2 Godwin Variable Frequency Drive (VFD)
- Godwin Field Smart Technology (FST)
- 8 Temporary valves (line stops)

RESULT: The implementation of the Godwin FST technology, combined with the use of electric versus diesel pumps as the primary pumps, ended up saving SUC thousands of dollars in man-hours and \$1 million in fuel costs, significantly reducing the cost of the overall project.

Next, for the eight smaller pump stations feeding into the primary bypass, Xylem engineers recommended that SUC install temporary valves (line stops) at the ends of each section as part of the bypass system to reduce the risk of a spill. SUC ultimately installed the line stops, and then removed them, as each section was tested and reconnected.

The third and final component of the bypass plan was to put contingencies in place in case of an emergency. Any spill during the bypass operation would be unacceptable, negatively impacting the environment and potentially costing SUC significant fines from the Environmental Protection Agency. But the teams knew the best way to mitigate the impact of a spill is to plan for it, so Xylem, SUC and Kimley-Horn worked closely to design an emergency response contingency plan for any potential mishaps. The plan outlined how an emergency would be handled, information about how back-up equipment would be provided, and action steps for the plan implementation.

Results

For sewer bypass operations like the NEI Rehab Project, utilities or contractors would typically engage in a “pump-watch” patrol, keeping an eye on the system 24/7 to be sure that the pumps are handling the required flow and averting any possible environmental disasters. With Godwin Field Smart Technology (FST) providing 24/7 automated monitoring, the onsite manual “pump watch” wasn’t necessary. The implementation of the FST technology, combined with the use of electric drive primary pumps, saved SUC thousands of dollars in man-hours and \$1 million in fuel costs, significantly reducing the cost of the overall project.

“Engaging Xylem in the planning and execution of this project gave us the reassurance that we were addressing our needs,” says Dustin Wagner of State Utility Contractors. “Their team of engineers was able to identify some of the challenges upfront, saving us time, money and headaches throughout the project. They have the expertise to know what it takes to get the job done, and that put our minds at ease.”



Bypass operations for the Northeast Interceptor Rehab Project included 2 Godwin CD300M Dri-Prime pump-sets with VFD.