



# United Electric Power

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“East Brunswick Water Authority” applied United Electric Power engineering solution on designing and installing a 400HP VFD with solid-state bypass at one of their municipal water pumping station.



## Challenge:

East Brunswick Water Authority wanted to utilize their current control cabinets due to not having enough room in the control room to mount new larger enclosures for the new 400HP VFD.

The municipality knew that the existing controls were complicated as the existing control was for a wound rotor motor whose speed control was via a liquid rheostat.

## Solution:

United Electric Power and East Brunswick Water Authority determined the best solution was to change the speed of the pump with a variable frequency drive.

A wound rotor motor changes speed of the motor by creating slip in the motor which is not energy efficient. By installing a variable frequency drive the customer will use less energy when operating below full speed.

The approved scope of work for this project resulted in:

- Remove the liquid rheostat
- Short the slip rings in the wound rotor motor and remove the associated power cables to the motor and to the existing motor controller. This work was done by United Electric Power motor/pump shop technicians.
- Remove the existing control logic components and label all incoming control cables for connection to the new control logic terminals. (this work was performed by United Electric Power prior to installation of the new equipment)
- Obtain all existing control logic to incorporate the logic into the design of the new system.
- Determine if the new equipment can be located in the existing cabinet(s) prior to full engineering design and determine the amount of shop (In-House) and field

labor required.

United Electric Power performed all engineering and generated a CAD drawing for review and procurement. United Electric Power fabricated a large control panel and pre-wired as many devices as possible in our UL508 panel shop. The VFD, reduced voltage solid-state starter and line/load contactors were pre-tested in our shop prior to installation at the facility.

The final installation of this project was completed in 2 working days to the satisfaction of the facility and final as-built documents were provided for the project.

### Value Created:

Several Key benefits were attained under the careful planning and execution of United's Design-Build Team.

- East Brunswick Water Authority was able to utilize existing cabinets with new state of the art equipment; keeping the costs of materials down
- East Brunswick Water Authority attained more precise control of their pump speed allowing them to control water levels at all times
- Energy efficiencies were substantial therefore lower costs to the bottom line were obtained

### About East Brunswick Water Authority

The Water Maintenance Division of East Brunswick Water Authority is responsible for maintaining 182 miles of water mains. This Division also handles emergency response on a 24 hour basis. The function of the Division is to insure the water distribution system is operational for delivery of water at adequate pressures and volumes during fire fighting, as well as normal domestic requirements. This Division also is mandated by the 1-800 call system, which requires underground utilities to be marked out prior to any excavation taking place.