

Cynergy Electric Company, Inc.

Water-Waste Water Treatment Plant Blue Plains Washington DC Main Substation Line C Transformer Replacement Contract #120030

DCWASA
5000 Overlook Ave, S.W.
Washington, DC 20032
Blair Ackerbauer, Project Manager
(202) 787-2537 (office)



Cynergy performed a \$4,621,543 contract for the DC Water and Sewer Authority at the Blue Plains facility at the existing main electrical substation. The project entailed keeping the existing pumping station operational during the construction process. The new equipment was installed in stages and energized.

Principle features of the project were as follows;

- Remove and replace the 24/32/40MVA OA/FA/FA 69KV-13.8Y7967KV automatic load tap changing liquid filled main substation line C transformer including 72KV station class lightning arrestors
- Remove and replace the 69KV oil circuit breakers with 2000A 69KV SF6 breakers on lines A, B and C
- Remove and replace the 69KV capacitor voltage transformers on lines B and C
- Remove and replace 13.8KV capacitor banks on lines A, B and C
- Replace the lighting in the substation yard with new fixtures, controls, wire and conduit
- Modify the existing substation structure to accommodate the new equipment
- Install new concrete pads for the capacitor banks, 69KV breakers, substation entrance and re-grade a portion of the substation yard
- Modify the substation yard perimeter fencing and provide new grounding
- Associated demolition, civil and structural work.
- Provide an Arc Flash and coordination study
- Provide instrumentation, UPS and control upgrades

Cynergy Electric Company, Inc.

- Provide NETA testing of all new equipment

Before the replacement of the transformer the entrance to the substation yard had to be reconfigured and a new entrance installed. A new concrete entrance ramp was constructed that would withstand the weight of rigging the old and new transformer weighting at close to 85 tons. The existing main substation transformer had to be drained and the transformer disassembled onsite due to the sheer size of the transformer. The weight was 169,000lbs and the dimensions were 14'D x 15'H x 15'W. The 6500 gallons of oil from the transformer was drained and incinerated in a TSCA approved facility. The new transformer had to be able to parallel with the existing transformers. The paralleling controls of the new transformer were complicated due to the age of the two existing transformer's controls. When all said and done the demonstration of the paralleling feature went off without a hitch.

The existing 69KV oil circuit breakers had to be replaced one at a time. The substation has three PEPCO 69KV circuits and two circuits had to be energized at any one time. The existing oil breakers were disconnected and removed. The oil from the breakers were drained and incinerated in a TSCA approved facility. The existing concrete pads were demolished and new concrete pads were constructed. New SF6 69KV breakers were then installed, connected to the substation structure and commissioned. The rigging and construction work was a delicate operation due to the 69KV substation being operational at all times. Safety of the construction crews were of utmost importance.

The existing 13.8KV capacitor banks had to be replace one at a time. The substation has three 13.8KV circuits and two circuits had to be energized at any one time. The existing banks were open type (exposed cell) installed on an open structure. The new 13.8KV capacitor banks were provided in an outdoor walk-in style enclosure with capacitor bank feeder and tie breakers. The existing concrete pads were demolished and new larger concrete pads were constructed. New 13.8KV capacitor banks were then installed, connected to the substation 13.8KV switchgear and commissioned.

Commissioning and field testing were a large component in the project. Factory customer witness testing was provided for the transformer. Third party field testing was provided for all high and medium voltage equipment, components and cables. Factory field services were provided for the transformer, 69KV breakers and 13.8KV capacitors. Hands on training, classroom training and operation and maintenance manuals were provided for all equipment and operational systems.

The owner awarded a modification to the contract to include modifications to the new capacitor bank control circuits, adding UPS units for control power, providing a new concrete pad and implement grounding modifications to the main substation.