SOUTH TREATMENT PLANT DUTY & PEAKING PUMP VARIABLE FREQUENCY DRIVE UPGRADE

Equipment and Systems Overview

- Peaking Pump VFD
- Duty pump motor rewinds
- Medium Voltage Cable
- Variable Frequency Drives
- Lighting and controls upgrade
- Duty Pump Motors
- VFD Controller Heat Exchanger Tube Bend

Offeror Role

Prime Contractor

Owner & Customer Information

King County Department of Natural Resources and Parks Wastewater Treatment Division

South Treatment Plant, 1200 Monster Road Renton, WA

Glen Hiraki, *Project Manager*
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Contract Amount & Type

$ 4,794,456, Firm Fixed Price C00942C15

Project Start and Finish Dates

2/1/2016 - 7/20/2018
(this project was completed 1 full year early)

Project Location

South Treatment Plant
1200 Monster Road Renton, WA 98057

Project Scope and Summary

This project took place in the operating wastewater treatment facility, South Treatment Plant.

Peaking pump VFD replacement:
The existing four Ansaldo Ross Hill VFDs were reused with exception of the controller and motor excitation components, which was replaced with General Electric (GE) controller equipment. New and additional current transformers/potential transformers (CTs/PTs) were required for power monitoring and replacement components were deemed necessary per section 16260.

Duty pump VFD replacement:
The existing four Toshiba VFD's were reused with exception of the controller, silicon control rectifiers (SCRs) and motor excitation components, which was replaced with GE controller equipment. New SCRs were required per section 16260. New and additional CTs/PTs were required for power monitoring and replacement components were deemed necessary per section 16260.

Duty pump motors:
The duty pump existing motors were rewound to include new windings for the stator and rotor as well as new RTDs (Resistance Temperature Detectors) in the motor stator windings. The insulation of the new winding was suitable for inverter duty operation. The motors were rewound per Electrical Apparatus Service Association and Institute of Electrical and Electronics Engineers standards. Bearing was replaced during the motor rewind.

ETS Building lighting upgrade:
High bay light fixtures and exterior fixtures that were replaced with Light Emitting Diode (LED) type. The exterior fixtures were suitable for outdoor weather conditions. New lighting controls replaced existing lighting controls in the ETS Building based on current technology and comply with the Washington State Energy Code.

Peaking pump VFD medium voltage cable replacement:
The peaking pump VFD medium voltage cables being replaced using existing conduit and raceways.

Peaking pump VFD controller heat exchanger tube bend replacement:
The peaking pump VFD heat exchange system contained 180 degree bend pieces that were spread out over the four (4) peaking pumps VFDs that contain six (6) racks each with each rack containing thirteen (13) heat exchangers. The total number of copper tubing bend pieces to be replaced is 312.

Problems Encountered and Solutions Executed

This facility had to remain in operation at all times, which required intuitive scheduling for all shutdowns and commissioning in order to accommodate County requirements. Facilitating commissioning of the new Variable Frequency drives with existing equipment brought to light communication troubleshooting with the Ovation system as well as vibration anomalies. All of which were addressed, investigated reviewed and closed under County review and acceptance.

Burke Electric Project Personnel

James Traver, General Foreman
Dominic Burke, Project Manager
Katie Morton, PE & Safety Manager

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