

Otter Creek Treatment Plant

project description | electrical and instrumentation

location

Richmond, Kentucky

client

Mr. Scott Althausen
Richmond Utilities
300 Hallie Irvine Street
Richmond, KY 40475
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project status

Under Construction

project budget

\$30,000,000



The electrical design includes a new 4,000A service at 480/277V. Two existing 750 KW generators will be relocated from existing plants to be decommissioned, and will be connected to the power system using paralleling switchgear. The control system is designed to prevent inadvertent connection of non-critical equipment in manual or automatic control modes when the plant is connected to the standby power system, and is also designed to automatically stage equipment startup to prevent system overloading. The power system includes parallel feeders and motor control systems to provide maximum reliability. The power system includes monitoring equipment at key levels within the system, and information is networked over the SCADA system, and accessed through an operator workstation in the administration building. An air terminal system is provided at each building, as well as transient voltage surge suppression at multiple levels throughout the power system. The project is designed in strict conformance with NFPA 820, Fire Protection in Wastewater Treatment and Collection Facilities, which defines hazardous areas throughout the plant, with electrical systems and equipment specified accordingly.

The plant control system includes automatic operation of most all processes, including

- Level controls for influent pump station
- Level and time control of screening equipment
- Time control of grit removal equipment
- Automatic On/Off and speed control for oxidation ditch aerators
- Time control of clarifiers
- Flow-paced UV disinfection system with automatic channel gate control
- Operator-selectable flow or level control for return sludge pumps

Plant instrumentation system utilizes magnetic flow meters for effluent and RAS flows, non-contact radar level system in conjunction with palmer-bowlus flume for influent flow, submersible pressure transducers for wetwell levels, and dissolved oxygen monitoring system at oxidation ditches.

The project includes a supervisory control and data acquisition (SCADA) system throughout the entire plant. The system is networked using a redundant fiber optic highway, which connects eleven programmable logic controllers, as well as power monitoring equipment, over an Ethernet network. The system is designed using a terminal services network with redundant servers and thin clients located throughout the plant, including wireless access within the plant. Human-machine interface provides operator access for manual and automatic controls and setpoints, as well as monitoring of plant parameters and key data. The system is designed for automatic generation of reports, and equipment maintenance tracking and asset management. Radio communications is provided for connection with remote sites.

Security provisions include alarm system consisting of door monitoring, motion detection, automatic gate system, and closed circuit television monitoring. The CCTV system is networked over a fiber optic highway, with operator access and recording from a workstation located at the administration building.