PORTLAND Engineering Inc.

UTILITIES

Portland Engineering frequently works with Utilities providers in the Pacific Northwest. Recently, PEI provided design-build engineering services for a Generating Station using three combustion turbine –HRSG generator units and one steam turbine. The existing distributed control system communication hardware was antiquated and required an upgrade of the control system. PEI managed all aspects of the project and organized a team approach, including O&M and technical personnel.

The Generating Station was a combined-cycle facility that has three GE frame 6B turbines with Heat Recovery Steam Generators and a GE steam turbine, generating 170 MW of electricity for distribution into the utility Grid. This system had been equipped with a Bailey INFI-90 Distributed Control System (DCS), installed with a Plant-Loop control bus, PC-based Engineering Workstation, proprietary OIS-20B rack-mounted HMI computers, and three Bailey touch screen displays consoles. Because the DCS was converted to an ABB, the existing plant loop components, OIS-20B and consoles, were no longer supported. PEI stepped in to help facilitate and improve the features and functionality of the HMI system by upgrading the existing DCS OIS-20 Operator Interface.

PEI developed a new HMI system using Wonderware InTouch operator interface application, version 10.1. To achieve this, we conducted a complete analysis of the existing OIS-20 system including graphic displays, trends, alarms, and security configuration. We then used the Bailey EWS console tools application and hard copy print outs of displays to identify all tag, trend, alarm, and controls elements of the existing system.

In addition to the control system hardware upgrade, we replaced the existing legacy Operator Interface (HMI) console with a new Wonderware system. The system consisted of five HMI computers designed for complete redundancy. The HMI system was configured entirely as a new application and had more than 40,000 tags. All customized graphic displays, trends, and alarms were developed to replicate the functionality of the original system with additional enhancements to take advantage of the newer technology of a PC based HMI system.

PEI hired and managed a local electrical contractor to perform the installation of control panels, system wiring and cabling, and fiber optic cable connections to a remote water treatment building. Our engineers configured all the control system hardware and performed installation, testing, verification, and startup services.

PEI performed pre-operational testing with the control system and operator interface hardware prior to final installation. The plant's control configuration logic was executed and the field I/O was simulated to verify all control functions of the system. PEI provided all aspects of Distributed Control System HMI replacement including detailed turnkey design, engineering, furnishing, installation, operation, testing, and documentation.