

Recovery Area DCS Installation

Background

The project consisted of converting the pneumatic instrumentation, controls and panel mounted motor controls equipment in a Kraft Recovery Mill to DCS and PLC control. The intent was to improve and optimize operational control through application of refined regulatory, supervisory and advanced controls. The scope of this project included additional controls for a previously upgraded Recovery Boiler, and new controls for the Evaporators, a Power Boiler, a Turbine Generator and the Feedwater system common to the boilers. A new modern state of the art control room was required to be built.

Orion CEM Inc. was awarded the EPC contract to perform the modernization work and provide advanced control algorithms. Orion hired KMH to perform detailed electrical and controls (E&C) engineering, E&C construction supervision, PLC programming, DCS configuration, commissioning and start-up services.

Design Approach

Most controls, in whole or in part, resided in equipment on panels in the existing Recovery control room. These control panels were to be removed, the area reused for new office space and a new Recovery Control room built, in place of existing offices, to contain the new (and existing) operator control stations.

Any functional equipment existing on the panels was to be migrated to the DCS or PLC's or relocated into the new control room.

All pneumatic transmitters and controllers would be replaced with electronic models. Valves and damper actuators requiring rebuilds would be fitted with electronic positioners.

New cable tray, field instrumentation cabinets and DCS I/O marshaling cabinets were required.

DCS and PLC processing and I/O capacity was increased in these areas to accommodate the conversion.

The existing Power Boiler Burner Management System (BMS) PLC was to be relocated from the existing control room to the MCC.

Scope of Supply

- Updated P&ID's
- Updated DCS system architecture drawing
- Instrument and Motor Index
- Instrumentation Specification sheets
- Instrumentation Location drawings
- Instrumentation loop drawings
- DCS control and graphics configuration
- Detailed Logic Drawings
- PLC hardware specifications
- PLC wiring and I/O drawings
- PLC programming
- Cable and termination schedules and block diagrams
- Marshalling cabinet designs and drawings
- Instrumentation cabinet design and drawings
- Updated MCC Starter drawings
- DCS/PLC Gateway documentation
- Control Panel Equipment relocation
- Control Panel decommissioning
- Commissioning and startup services
- List of recommended spares
- Commissioning, interlock and graphic checklists

Summary

This fast track project proceeded in parallel with, and shared areas of common concern with a new Recovery Boiler project, a Recovery Balance of Plant project and a Feedwater Protection System. Engineering began in Sept 2000. The Power Boiler started up under new controls in December 2000, the Recovery Boiler and Evaporators started up in January 2001. All performance guarantees were met. The project was an overwhelming success.

References

- Dan Loitz, Project Manager, Orion CEM Inc.
- John Boegh, Field Service Engineer, Babcock and Wilcox
- Dave Arthur, Engineering Manager, 807-475-2159

