



A Rockwell Automation Company

El Paso Corporation / Colorado Interstate Gas Co. Table Rock Boiler Upgrade

The Client:

El Paso's interstate transmission system spans the nation, border to border and coast to coast. The nationwide pipeline system is consolidated into three regional operations.

The Western Pipeline group consists of El Paso Natural Gas Company and Colorado Interstate Gas Company and is headquartered in Colorado Springs, Colorado.

Colorado Interstate Gas (CIG) is a major transporter of natural gas in the Rocky Mountain region. The Colorado Interstate Gas System is connected to nearly every major supply basin in the Rocky Mountains as well as production areas in the Texas Panhandle, Western Oklahoma, Western Kansas, and Wyoming.

The Requirement:

Hinz was contracted to upgrade the boiler controls on one of the two (2) boilers located at the CIG Table Rock Facility near Rock Springs, Wyoming. The facility was previously equipped with a pneumatic control system, which was extremely difficult to maintain and operate, resulting in decreased plant load. The existing control system had extremely poor energy performance.

A controls equipment upgrade would improve energy performance and boiler operational safety. The areas of concern and project highlights consisted of:

- The Burner Management System (BMS) would monitor critical inputs during the “on-control” operation.
- The Burner Management System incorporates a single UV scanner (self checking) and flame amplifier, programmed in a programmable logic controller (PLC) to recognize the presence or absence of pilot or main flame in the burner.

- The detection of flame, at appropriate times during the light-off sequence and during sustained normal operation, are supported with additional field inputs and outputs to provide a safe operation of the combustion equipment.
- The combustion control system (CCS) would control the fuel, water and steam PID control loops within the control system.
- The PLC processor is monitored for correct operation by an external watch dog timer, which must be periodically reset by a timed output pulse from the PLC. Failure to reset the watchdog timer is interpreted as a major PLC fault, and the BMS is shutdown.
- The system would have to be configured to meet all NFPA code requirements for certification.

The Design Solution:

The new control system at Table Rock consists of an HMI node, a View node, a Combustion Control System PLC (CCS) and the Burner Management System PLC (BMS).

- A control panel was engineered to house the CCS and BMS PLCs. The two dedicated systems have individual Allen-Bradley ControlLogix PLCs with full process control capabilities.
- The CCS is a fully metered, cross-limited system with oxygen trim. The feedwater control system is a three (3) element control system and is programmed in the CCS.
- Six (6) field transmitters were replaced with new transmitters and an oxygen analyzer was added to the exhaust stack. BMS field devices were used where applicable.

A complete Intellution Fix32 HMI system was developed to allow operators to monitor and control the boiler. The new HMI package was configured utilizing the CIG standards

Hinz had implemented on earlier projects. The Forced Draft (FD) fan and motor were retrofit with a Variable Frequency Drive (VFD) system to provide low-end operation and flexibility to meet future full load capabilities.

The PLCs communicated to one another via ControlNet. The ControlNet was also connected to the VFD for normal control, start, stop and speed controls. Ethernet communications between the HMI and PLCs allowed access to the PLCs for process information.

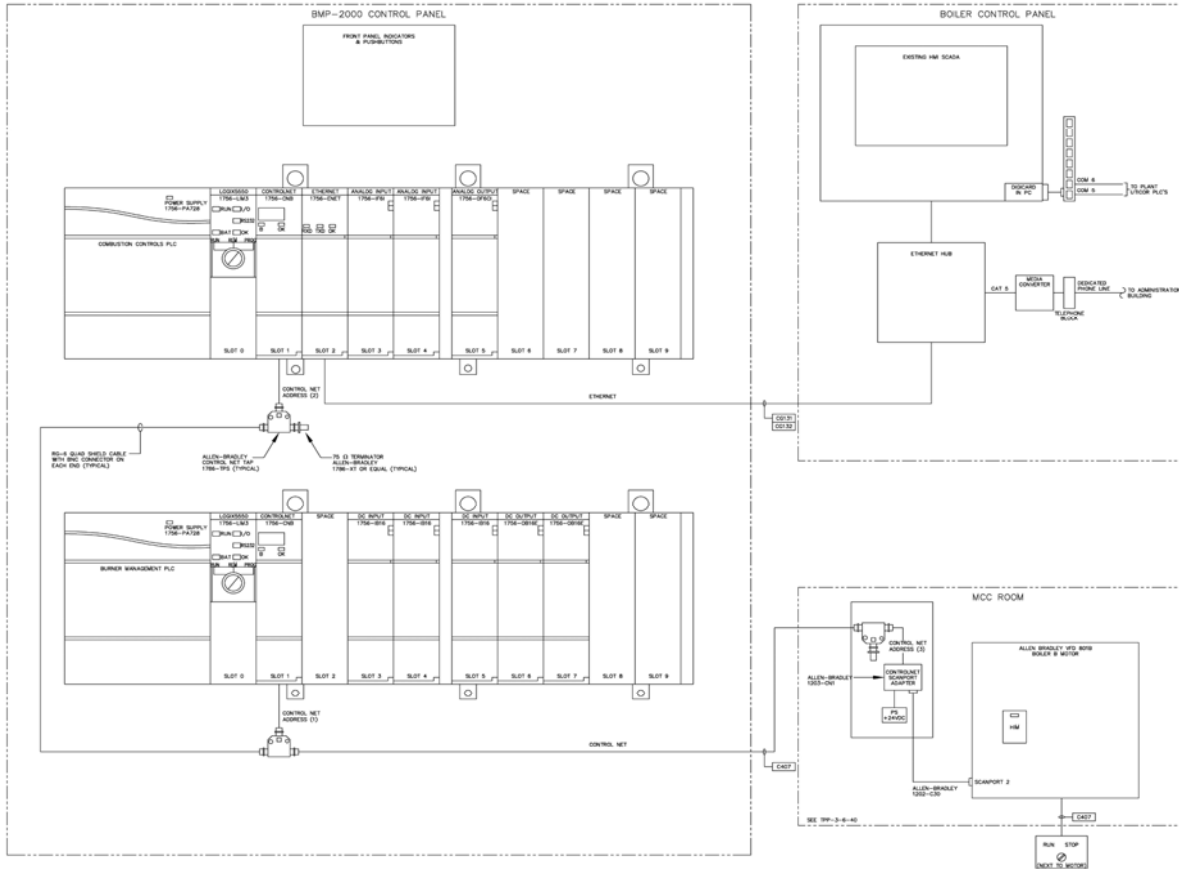
Boiler A was retrofit with a lower drum heating coil to provide “hot” standby without using any natural gas firing. The auxiliary steam was provided from boiler B to keep the boiler warm and under partial pressure. This approach saved in natural gas usage and prevented corrosion of the internals from occurring .

The process systems were commissioned and certified to meet the NFPA code requirements.



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System Specifications:

- (1) Burner Management System (BMS) Allen-Bradley ControlLogix PLC.
- (1) Combustion Controls System (CCS) Allen-Bradley ControlLogix PLC.
- (1) Intellution Fix32 HMI Node Version 7.0.
- (1) Intellution Fix32 View Node.
- (1) Forced Draft (FD) Fan VFD.
- (1) Boiler Lower Drum Heating Coil.
- Process Control communications via redundant Allen-Bradley ControlNet.
- SCADA Control communications via Ethernet.
- Boiler Control System is fully configurable and fully NFPA certified.
- (1) Zurn 55,000 lbs Boiler

For further information or to contact a Hinz office near you, please check our website at:

www.hinz.com