



A Rockwell Automation Company

El Paso Corporation / Colorado Interstate Gas Ft. Lupton Compressor Station

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:

CIG constructed a natural gas compression facility in north-eastern Colorado near the town of Ft. Lupton. The station needed to install three (3) packages of 2225hp Caterpillar G3608TALE engine driving an Ariel JGD-4 compressor. In addition to the compressors, the station required a compressor building, auxiliary building, electrical and control building, radio tower and building, water well and septic system, and measurement facilities.

The SCADA system allows Gas Pipeline Controllers in Colorado Springs to monitor conditions at Ft. Lupton Station and change set-points for suction pressure and discharge pressure control. The Gas Controllers have the capability to remotely start and stop the units.

The Station PLC to be located in the control room, will moni-

tor and control items not directly associated with the units. These items include the ESD system, yard valves and instruments, station gas scrubber, fuel gas skid, auxiliary equipment, the station bypass valve, and station fuel gas measurement. The Station PLC will provide station process control and provide each unit with a reference speed set-point. Additionally, the Station PLC will act as the power management director to determine when electric equipment is to be started and stopped.

The Unit PLCs will be located in the Unit Command Panel that is adjacent to each unit skid in the Compressor Building. The Unit PLCs will perform engine and compressor control, unit protection, and also control the gas after-coolers.

The Design Solution:

Hinz was contracted to design and implement the control system. Initially, Hinz prepared a Functional Requirements Document which finalized the control system design configuration.

El Paso's design standards for the new installation included an Intellution Fix32 HMI node along with four Allen-Bradley ControlLogix PLCs.

The reciprocating engines are manufactured by Caterpillar. Caterpillar will not allow any purchaser of their engines to control the parameters of a Caterpillar engine. Thus, all functions of the Caterpillar engines will be controlled by the Caterpillar Engine Supervisory System (ESS) through their proprietary unit control panel.

The Unit PLC was required to have local HMI control in addition to remote HMI control. Local control was accomplished by using Intellution IVisualize.

Emergency shutdown logic (ESD) was programmed in the Station and Unit PLCs for emergency situations like fire and hazardous gas level detection.

Hinz provided the following software automation services for the Ft. Lupton engine, compressor, and station control system:

- Consultation to finalize the control system configuration design.
- Software design and programming for the Station and Unit PLCs using Allen-Bradley ControlLogix PLCs and Rockwell RSLogix5000 software.
- System design and configuration for the Station HMI using Intellution FIX32 SCADA software.
- System design and configuration for the Unit Panel HMI, Intellution IVisualize software.
- Assistance to CIG during the site commissioning at the facility.
- Training to the CIG staff.
- Budget and schedule reporting throughout the project.

