



A Rockwell Automation Company

El Paso Corporation - Colorado Interstate Gas Drennan Road Blending Facility

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 asked to provide new Wonderware InTouch HMI and ControlLogix PLC control systems for a natural gas and air blending facility located at the Drennan Road Meter Station near Colorado Springs, Colorado. In the expansion project, El Paso installed a tap on the 212A-20" pipeline to provide raw gas for the blend station. A valve was used to regulate the raw gas flow rate. Compressed air is blended with the raw gas to control the wobble number and BTU of

the blend gas. The air compressors are required to start automatically when blending is required. The air flow rate is then adjusted to achieve the desired wobble number and BTU of the blend gas. The blend gas is injected into the 9A-20" pipeline. The raw gas flow rate, blend gas wobble, and blend gas BTU set-points are set by the operator.

The Design Solution:

Hinz was asked to engineer electrical and control systems for the Drennan Road Blending Facility, including Wonderware HMI and Allen-Bradley ControlLogix PLC programming.

A Wonderware HMI was used as the primary interface for monitoring and controlling all station and compressor functions. A dedicated Allen-Bradley ControlLogix PLC with Fisher ROC-364 RTU was installed to monitor and control the blending facility. In addition, a PanelView OIT was installed in the compressor building for monitoring the compressors. The HMI, PLC, and ROC were connected to the WAN via Ethernet. The PLC, OIT, Flex I/O and VFDs communicate over a ControlNet network. The HMI polls the Fisher ROC through a serial connection. The ControlLogix Station PLC performs all station and unit control functions. The Fisher ROC performs all flow calculations, controls the raw gas flow rate and tube switching valves, and the compressed air final discharge block valve. The final block valve is a safety to prevent excessive blend gas oxygen from entering the system should the PLC be unable to control the process. The blending facility includes two air compressor trains designed to operate independently or at the same time based on demand. Each train includes a low pressure rotary screw compressor, compressed air dryer, dry air storage receiver and high pressure reciprocating compressor. The screw compressor is packaged with its own control system

and starts on demand to provide adequate suction pressure to the reciprocating compressors. The ControlLogix Station PLC monitors the compressor alarm status and provides a start permissive interlock.

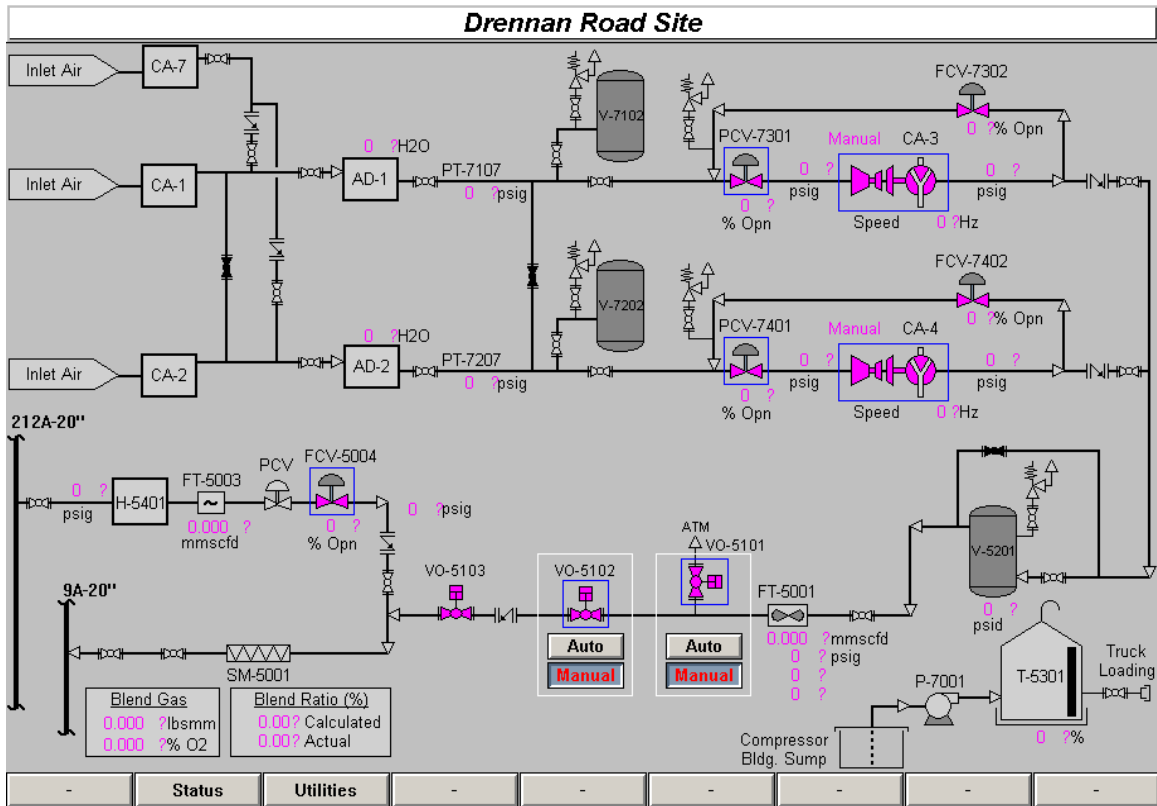
The reciprocating compressors and coolers are controlled by the ControlLogix Station PLC. A dedicated pressure control valve is used to provide constant suction pressure to each compressor. Speed for both compressors is adjusted with a VFD to achieve the desired blend ratio (ratio of raw gas flow to compressed air flow). Each compressor also includes a bypass control valve that is used for additional blending control when the compressor is at minimum speed. The reciprocating compressor is fully automated to start on demand. A lead-lag controller is used to distribute the run hours between the two trains.

Compressed air from both trains is feed through a high pressure coalescing filter equipped with a local level controller before being metered. Air metering consists of three ultrasonic meter runs with tube switching valves. The air dryers are packaged with their own control systems. The Station PLC monitors the moisture content and the alarm status of the air dryer package. Filter differential pressure alarms are also monitored by the Station PLC.



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System Specifications:

- (1) Station SCADA Node, Wonderware InTouch
- (1) ControlLogix 1756-L55 PLC with Chassis
- (1) ControlLogix 1756-ENB Ethernet Module
- (1) ControlLogix 1756-CNBR ControlNet Module
- (2) ControlLogix 1756-IA16 16-pt AC Input Modules
- (2) ControlLogix 1756-OX8 8-pt Relay Modules
- (4) 1794-IE8 Flex I/O 8-ch Analog Input Modules
- (5) 1794-IF4I Flex I/O 4-ch Analog Input Modules
- (2) 1794-OF4I Flex I/O 4-ch Analog Output Modules
- (6) 1794-IB16 Flex I/O 16-pt Discrete Input Modules
- (1) 1794-OB8 Flex I/O 8-pt Discrete Output Modules
- (1) 1794-OW8 Flex I/O 8-pt Relay Output Modules
- (4) 1794-IRT8 Flex I/O 8-ch RTD Input Modules
- (5) 1794-ACNR Flex I/O Communication Modules
- (2) A-B 1336F-PlusII Variable Frequency Drives

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

www.hinz.com