



A Rockwell Automation Company

El Paso Corporation - Colorado Interstate Gas Greasewood Station Backhaul Piping

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 engineer Station and Unit PLC Control Systems for bi-directional pipeline flow control valves installed at El Paso's Greasewood natural gas compressor station located in western Colorado.

The project modifications would allow El Paso to backhaul 69 MMscfd of gas from Wamsutter to Dark Canyon and 150 MMscfd of gas from Parachute Lateral to Sand Springs in the

event that supplies at Natural Buttes were unavailable. The new installation would also provide an additional 20 MMscfd in backhaul space from Wamsutter to Dark Canyon.

Hinz would provide PLC and Intellution Fix32 HMI program revisions along with electrical and control panel design, electrical physical design, and control systems schematic drawings.

The Design Solution:

Hinz was contracted to engineer the electrical and control systems for Greasewood Station. During the initial scoping phase of the project, Hinz advised El Paso that the existing Uticor Station PLC with existing I/O modules would not provide suitable I/O connection space for the new valves and instrumentation unless additional I/O racks and modules were added. Hinz further advised El Paso that the existing ControlLogix PLC serving CG-1 could be upgraded and used as the primary Station PLC. This would also allow for the disconnection and removal of the Uticor PLC. This idea was chosen as appropriate for the site and design was implemented using Allen-Bradley 1756 ControlLogix PLCs and 1794 PLC Flex I/O PLC modules.

Part I of the project involved the conversion of the existing Uticor 6001 Station PLC program to ControlLogix. The new ControlLogix Station I/O program was added to the existing ControlLogix Station PLC program that resides in the control room processor. This ControlLogix Station PLC previously served only as a data consolidator for data signals sent from the CG-1 Unit PLC to the HMI computer. The Fix32 HMI program was updated with new PLC I/O addresses to correspond with the new ControlLogix Station I/O, and new animation was added to the Greasewood Site HMI screen. The ControlLogix PLC was interfaced to the Station HMI computer using existing Ethernet communication links. The existing Uticor 6001 Station PLC and power supply was removed.

Part II of the project involved the automation of SIX new yard valves and SEVEN existing valves. The valves were installed with actuators and position switches so that they could be remotely operated from the existing Station HMI computer.

Part III of the project involved the separation of existing PID speed control loops for CG-2 and CG-3 which were previously combined in PLC logic and the HMI screens. Previously both of these shared only one meter flow rate transmitter, one suction pressure transmitter, and one discharge pressure transmitter signal as the process variables. Dedicated transmitters were now used in the new software configuration.

Part IV of the project involved the addition of two new pressure control valves and one new pressure transmitter to the ControlLogix PLC and HMI system.

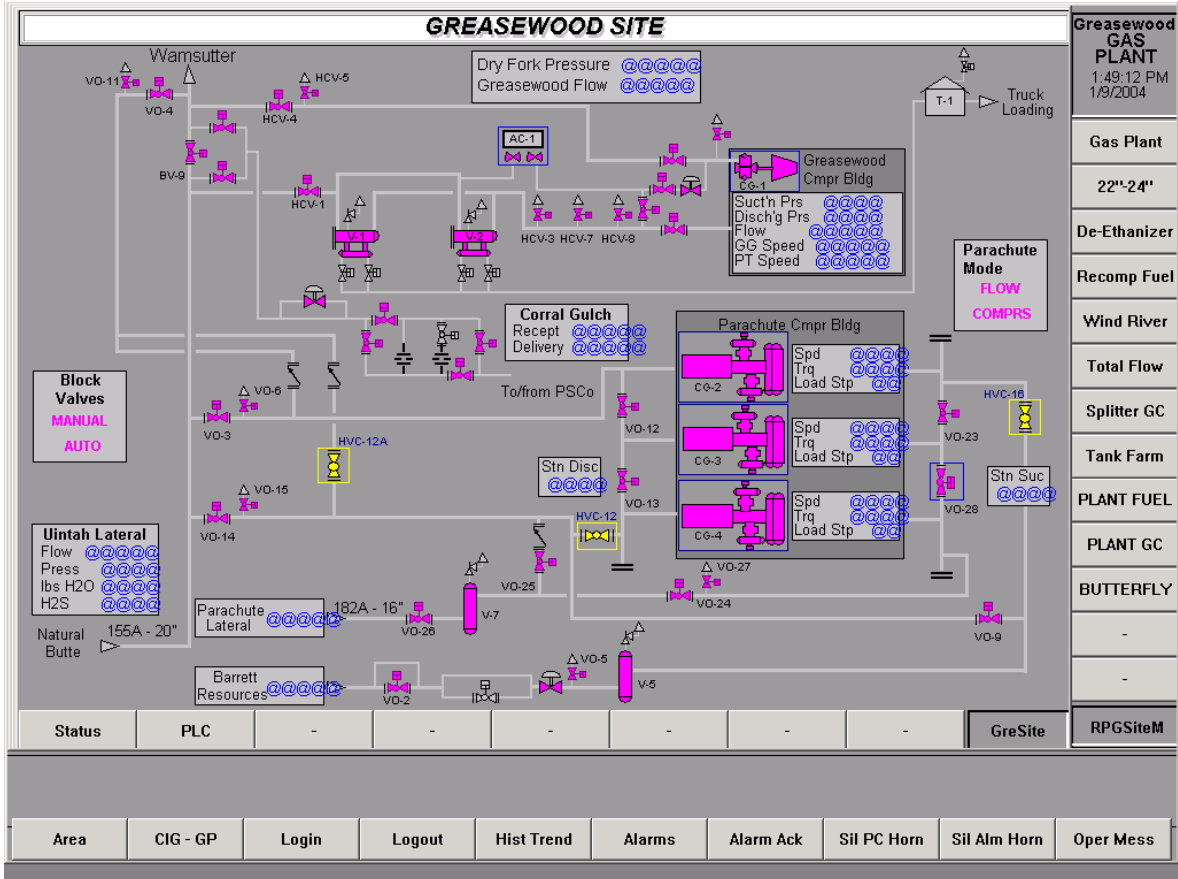
Part V of the project involved the conversion of existing PLC emergency shutdown (ESD) controls from the Uticor PLC to the new ControlLogix PLC.

Part VI of the project involved revisions to the existing ControlLogix Unit CG-1 PLC (UCP) to share I/O signals with the updated Station ControlLogix PLC. Previously these signals were hardwired from the Uticor PLC to the Unit ControlLogix PLC.



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System Specifications:

- (1) Station SCADA Node, Intellution Fix32 HMI Version 7.1
- (1) Station PLC Allen-Bradley ControlLogix5550 with I/O Modules
- (1) Unit PLC Allen-Bradley ControlLogix5550 with I/O Modules
- (1) Governor PLC Allen-Bradley ControlLogix5550 with I/O Modules
- (4) Allen-Bradley Flex I/O Drops using 1794-ACNR Communication Modules
- PLC to SCADA Node Communications via Ethernet
- Unit PLC, Gov PLC, Station PLC, and Flex-I/O Communications via Allen-Bradley ControlNet

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

www.hinz.com