



A Rockwell Automation Company

Colorado Interstate Gas, El Paso Corporation Rawlins Plant, Truck & Rail Delivery Pumps

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 Truck and Rail Delivery Product Pump PLC Control Systems for the Gas Plant at El Paso's Rawlins natural gas compressor station located in southern Wyoming.

Gasoline, butane, and propane products from the plant are presently loaded onto trucks and rail tank cars at the Rawlins facility by using eight delivery pumps. The pumps were previously controlled by an obsolete Cutler-Hammer D200 PLC. The project involved moving control of delivery pumps

to a new Allen-Bradley FlexLogix PLC, upgrading communication links and metering hardware, and automating the loading system.

Hinz would provide PLC and Wonderware 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 electrical and control systems for the Truck/Rail Delivery Product Pump Project at El Paso's Rawlins Gas Plant. There were three parts to the project as described below.

Part 1 of the project involved moving control of delivery product pumps from the existing Cutler-Hammer D200 PLC to a new Allen-Bradley FlexLogix PLC. The new "Pump PLC" and I/O modules were installed in Switch House #3 near the existing MCC. Approximately 50% of the existing cables were replaced with new. The obsolete C-H PLC was then removed from service. The Wonderware HMI program was updated with new PLC I/O addresses to correspond to the new Pump PLC program logic, and a new pump control HMI screen was added to control and animate operation of the pumps.

The control system upgrade also included electric operated plant yard valves VO-52, VO-55, and VO-58. Wiring for these valves was reconnected to the new Pump PLC. Open and closed status indication was displayed and animated on the HMI screen. HMI valve symbols were animated to change color to indicate open, closed, transit, and alarm status.

Gas Plant Control Room modifications were also included in Part 1. Existing Control Room pump On/Off status indicator lights and Start/Stop pushbuttons located on the control board and their circuit wires were disconnected and removed. These indicators and controls were added to the HMI screen.

A new mushroom-head pump E-Stop pushbutton was installed on the control board and wired to the new Pump PLC.

Part 2 of the project involved modifications to the Rail Loading Facility pump control system and installation of a new Ethernet radio communications network. New CISCO Ethernet 2.4GHz radio equipment, towers, and antennas were installed to provide Ethernet radio communications between the Rail Loading Facility and the Gas Plant. Rail Facility operator control devices such as the pump On/Off indicator lights and pump Start/Stop push-buttons were reconnected to new remote PLC Allen-Bradley Flex I/O modules located at the Rail Facility. The PLC Flex I/O modules are a remote part of the Pump PLC system and transmit their I/O signals via the new Ethernet radio link to the Pump PLC located in Switch House #3 at the Gas Plant.

Part 3 of the project involved conversion of the manually operated truck loading system to an automated system. New Microload and Accuload metering and delivery controllers were installed at the truck loading racks along with a new fiber-optic communication network and components. In the control room, a new computer with Linco-Electromatic Automated Terminal Control System software was installed to control product allocation per customer and to provide database information for incorporation into El Paso's existing accounting system.



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File Logic Debug Special
Development!

Delivery Product Truck & Rail Pumps

<div style="text-align: center; border: 1px solid gray; padding: 2px;"> Pumps 3, 4, 5 <input type="button" value="Auto"/> <input type="button" value="Manual"/> </div>	<input type="button" value="Start / Stop"/>	Pump 1		Re-Run & Lean Oil Make-Up		
	<input type="button" value="Start / Stop"/>	Pump 2		Gasoline Rail		
	<input type="button" value="Start / Stop"/>	Pump 3		Butane Rail & Gasoline Truck	<input type="button" value="Butane"/>	<input type="button" value="Gasoline"/>
	<input type="button" value="Start / Stop"/>	Pump 4		Butane Rail & Propane Truck Back-Up	<input type="button" value="Butane"/>	<input type="button" value="Propane"/>
	<input type="button" value="Start / Stop"/>	Pump 5		Propane Truck	<input type="button" value="Off"/>	<input type="button" value="Propane"/>
	<input type="button" value="Start / Stop"/>	Pump 6		North Propane Rail	<small>NOTES For Pumps 3, 4, 5: 1) Only One Truck Loading Pump May Be Selected At Any Time. 2) Pump Must Be OFF To Change Selection.</small>	
	<input type="button" value="Start / Stop"/>	Pump 7		South Propane Rail		
	<input type="button" value="Start / Stop"/>	Pump 52		Iso/Normal Butane Truck		
	<input type="button" value="Start / Stop"/>	Pump S-2		Lean Oil Supply (P28-29)		
	<input type="button" value="Start / Stop"/>	Pump S-3		Propane Re-Injection		

Rawlins Gas Plant
 8:41:42 AM
 12/7/2004
 None
 Level 0

Gas Plant
 22" & 24"
 De-Ethanizer
 Recomp Fuel
 Win River
 Total Flow
 Splitter GC
 Tank Farm
 Plant Fuel
 Plant GC
 Butterfly
 Truck Pumps
 -
 -
 -
 I/O Reinitialize
 Driver Status
 HMI Help

Gas Plant	-	-	-	-	-	-	-	-	-
Date	Time	Name	Value	Comment					
There are no items to show in this view									

Area
Raw Overview
Rawlins GP
Logon/Logoff
History Trend
Area Alarms
RawlinsGP Alm
Sil PC Horn
Sil MB Alm Hrn
-

System Specifications:

- (1) Gas Plant SCADA Node, Wonderware HMI Version 8.0
- (1) Delivery Product Pump PLC, Allen-Bradley FlexLogix 1794-L34B with I/O Modules
- (1) Rail Loading Facility PLC, Allen-Bradley Flex I/O 1794-AENT Ethernet Communication Module and including Allen-Bradley Flex I/O 1794-IB16 and OB8EP Modules.
- (4) CISCO Aironet 1310 AP/BR, 2.4 GHz Ethernet Radios
- (4) CISCO 2.4 GHz Ethernet Solid Dish Radio Antennas, including Radio Antenna Towers
- (1) Pump PLC to Rail Loading Facility to SCADA Node Communications via Fiber-Optic and CAT5e Ethernet Cables.
- (1) Truck Loading Rack Equipment, Linco-Electromatic Automated Terminal Control System

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

www.hinz.com