El Paso Corporation / Colorado Interstate Gas Co.
Ft. Morgan Valve Sequence Automation

A Rockwell Automation Company

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:

Eleven new yard valves would be added to the Ft. Morgan Compressor Station to make a total of 33 valves. Automation for sequencing the opening or closing of the yard valves was needed, rather than having the operator "manually" open and closed each valve. This automation was needed to automatically control each of the plant modes, Recovery, Injection, Shut-In, etc.

The upgrade would include Uticor PLC logic revisions along with Intellution Fix32 HMI screen revisions. On screen modifications also needed to be made to the functionality of the existing HMI control buttons that control the valves.

"Hands-off" functionality is desired to allow the PLC logic to step through a table to open or close each of the plant's 33 valves in a preset sequence. The PLC would automatically open or close each valve in a designated order without the operator having to toggle each valve separately.

The Design Solution:

Hinz was contracted to perform the Uticor PLC and Intellution Fix32 HMI program modifications to automate the new and existing valves. General design of the sequence tables was discussed and finalized for the 33 valves.

Each sequence step would have a designated "Control Action" to be performed by the PLC logic at that particular step. The Control Action would include Open, Close, and Verify valve position. Indication would be shown on the HMI screen as each Control Action was performed.

Each step would include an "Alarm Action" to be performed by PLC logic if the Control Action failed at that step. Three Alarm Actions would be included in the PLC logic. In each case, the HMI would indicate to the operator the point at which the valve sequence failed. Valve travel alarms and pressure alarms would be latched until reset by the operator. All alarms had to be acknowledged on the HMI to be removed from the alarm banner or alarm display. Only currently active alarms would be displayed.

A "Sequence Complete" HMI indicator would also be included on the HMI screen to indicate to the operator that all sequence steps had been successfully completed.

An "Auto/Manual" control button would be added to the HMI screens and PLC logic. In manual mode, the operator would be able to select the valve position for every valve through the HMI screen, one at a time. In auto mode, the valve positions would be set by the step sequence in the specified order. In auto mode, a "Sequence Start" HMI button would be added to start each sequence.

A total of 10 sequences were programmed to place valves in the correct position for the Recovery, Injection, and Plant Shut-In modes.

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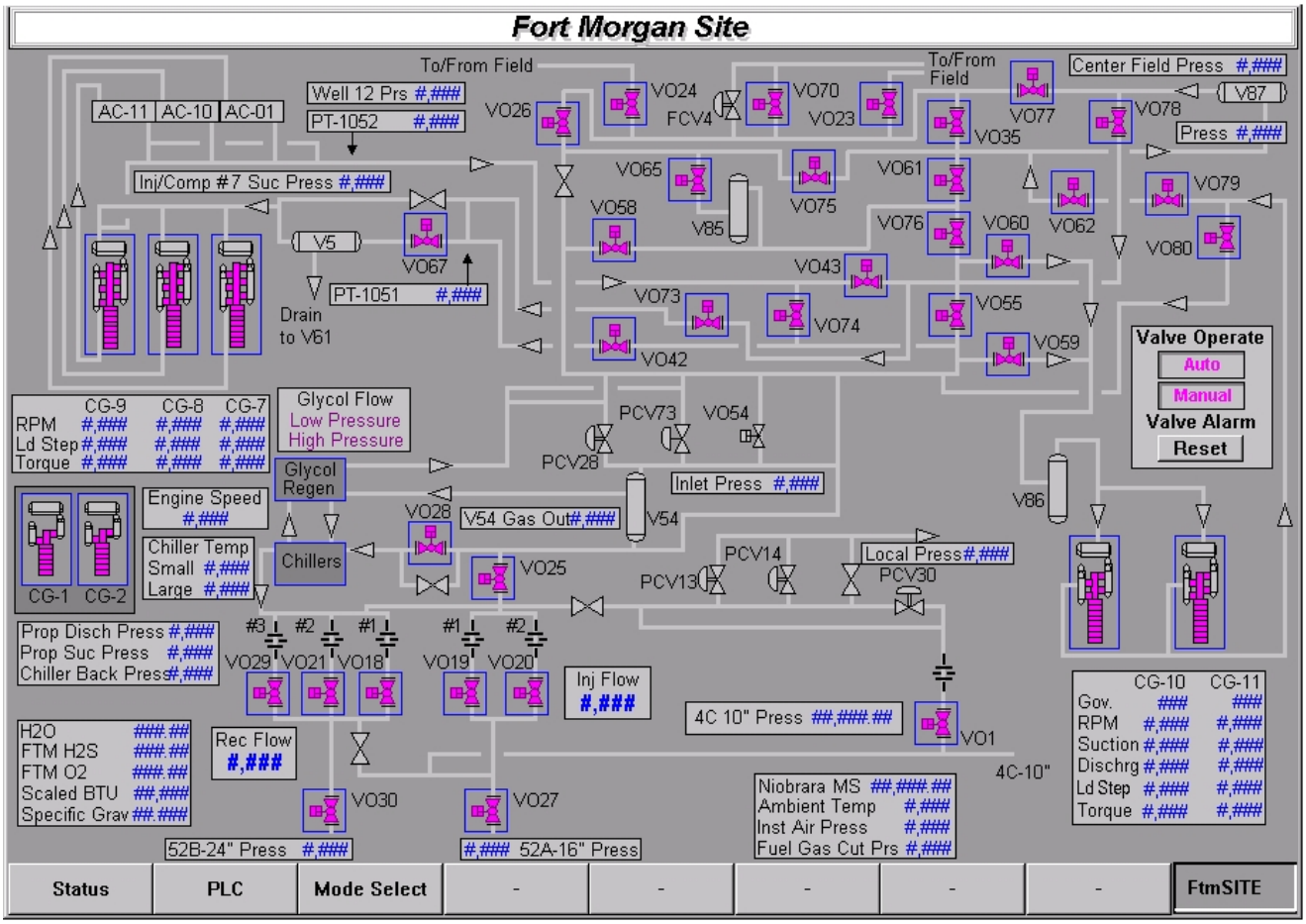

System Specifications:

- Intellution Fix32 HMI Development Software
- Uticor (Struthers-Dunn) 6001 CPU with Development Software
- Qty (16) Uticor 6001 8-Point Discrete Input Modules
- Qty (16) Uticor 6001 8-Point Discrete Output Modules
- Qty (10) Uticor 6001 8-Point Analog Input Modules
- Qty (6) Uticor 6001 2-Point Analog Output Modules
- Qty (5) Uticor 6001 High-Speed Remote I/O Interface Modules

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

www.hinz.com