



A Rockwell Automation Company

Northern Natural Gas Co. Garner LNG Automation LNG Facility Rosemount RS3 and Relay Logic

The Client:

Northern Natural Gas is one of the nation's largest interstate gas pipeline systems, based in Omaha, Nebraska. They operate pipeline systems extending from the Permian Basin in Texas to the upper Midwest. NNG has approximately 17,000 miles of pipeline and 1100 employees. Northern Natural Gas provides transportation and storage services to

approximately 75 utility customers and numerous end use customers in the upper Midwestern United States. They provide cross-haul and grid transportation between other interstate and intrastate pipelines. NNG also operates three natural gas storage facilities and two LNG peak-shaving units.

The Requirement:

Northern Natural Gas needed to expand the control system within their LNG peak shaving and storage facility in Garner, Iowa. The existing system was an aging Rosemount RS3 DCS system that was becoming difficult to integrate with other components, including SCADA and local control units and therefore the plant personnel and NNG recommended that that system be replaced as part of the expansion.

It was determined that the new system would be of an open architecture design, utilizing standard hardware and software

platforms. The project would be implemented in stages over a two or 3-year period, and would eventually replace the entire RS3 system with a new control system based on PLCs and PC based HMIs. The new open architecture system would result in cost savings by reducing maintenance cost. The new system would also allow for an easily expanded control system, removing the dependence on a single DCS control center.

The Design Solution:

The essential objectives of the project were to move all process equipment from the old control system (a combination of RS3 DCS and local electrical panels) to a PLC based system, add additional I/O points, enhance the control program and provide common local HMI stations for field unit control. Another project objective was to reduce overall operations and maintenance costs. To achieve this a new Maintenance and Operations Manager (MOM) controller to support a redesign of the Life Safety System, including replacement of the RS3 SCADA communications, the ability to link to other remote PLCs and coordinate data between PLCs was provided.

Special criteria for the system were that parts of the system were to be located in hazardous locations that required Class1, Div 2 compliance. In addition the Burner Management system used by Vaporizers had to be designed and approved according to the requirements of the National Fire Protection Association (NFPA) 86 codes, Industrial Risk Insurers (IRI) and Factory Mutual loss prevention guidelines.

The primary system platforms chosen for the design solution were Rockwell ControlLogix PLCs, Wonderware InTouch HMI and Ethernet communication.

The ControlLogix PLCs allowed for easy future expansion by way of either the remote I/O capabilities of the unit PLCs, or by linking additional PLC processors together over the Ethernet network. This system architecture allows critical process areas of the plant to be supported by separate and

independent PLCs, all communicating back to the MOM controller in the main control room.

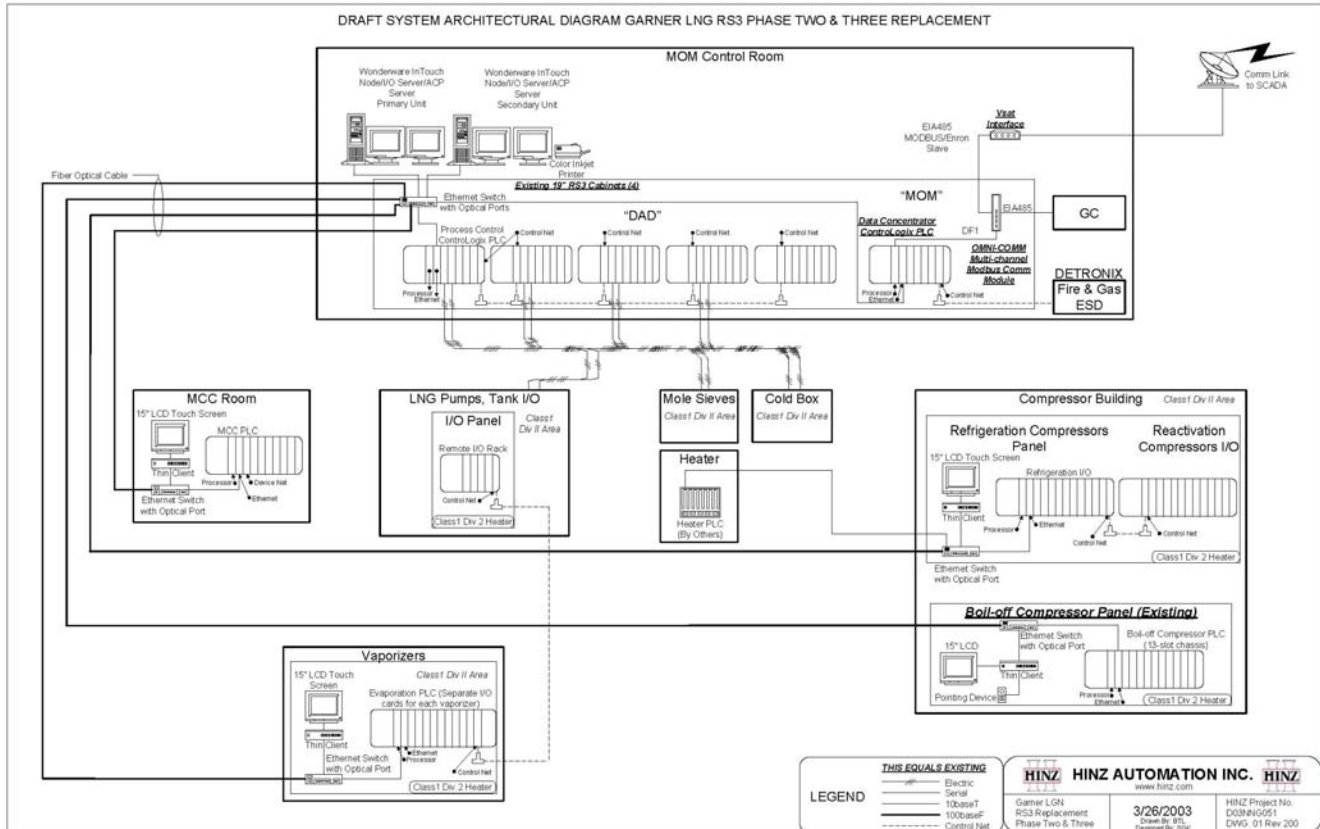
The Wonderware InTouch application was setup in a redundant configuration and is used to monitor and control process equipment. Since one of the project objectives was reduction of the system maintenance, it was decided to implement the HMI system based on Microsoft Terminal Services technology. To further simplify maintenance a decision was made to use rugged diskless Thin Client computers as local control panels. If a client fails, a replacement is installed, an IP address entered and the client is ready to operate without a need to restore any software. All InTouch configuration changes are made on the servers, and then automatically pushed to the clients.

Hinz was responsible for all hardware, software, and engineering for the project as well as setting up the industrial Ethernet network. Hinz assisted the client with the analysis and specification of the automation equipment supplied and the overall system architecture. The engineering scope of work involved reverse engineering the RS3 to provide similar functionality since this was a functional site. The configuration was then enhanced in cooperation with NNG to provide updated control capabilities as well as improved performance and safety. The Hinz scope also included electrical design and supply of the local HMI panels as well as design for use of existing RS3 cabinets in the control room. On site commissioning was also provided.



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System Specifications:

- Wonderware InTouch 8.0 for Terminal Services
- ACP ThinManager™ for thin client support
- Allen Bradley ControlLogix PLCs
- Yycom ACP-enabled client with Daisy Data monitor and pointing device
- Microsoft Windows 2000.
- Sixnet Industrial Ethernet Switches

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

www.hinz.com