



A Rockwell Automation Company

## Metropolitan Utilities District of Omaha Peak Shaving Control Upgrade

### The Client:

The Metropolitan Utilities District of Omaha (MUD) is a public utility responsible for providing gas and water service to Omaha, Nebraska and the surrounding communities. The District's Gas Production Division consists of three peak shaving plants with the following production capabilities:

One Liquefied Natural Gas (LNG) Plant with a vaporization rate of 60.0 MSCFD, and a liquefaction rate of 6.0 MSCFD.

Two Propane Air Plants with vaporization rates of 41.8 MSCFD and 34.8 MSCFD.

### The Requirement:

The LNG Plant was constructed in 1974, and the Propane Air Plants were constructed in 1960-61. The current control systems are a mixture of electrical relays and contacts, electronic controllers, and pneumatic controllers and valves. Some original single loop pneumatic controllers have been replaced with electronic controllers and I/P transmitters, which are connected to original pneumatic valve actuators. Most original pneumatic field transmitters have been replaced with "smart" type electronic transmitters. The entire system consists of a collection of single-loop controllers, stand alone relay

systems, and add on recorders and annunciators. Each major piece of plant equipment continues to require a localized manual start-up. Once the entire plant is on-line, most operational adjustments can be made from the Control Room.

It was desired to replace the existing controls with a control system based on an open architecture. Required capabilities include plant start-up and operation from graphic control terminals, on-line system changes and modifications, historical trending and reporting capabilities, and programmed safety shutdowns.

### The Design Solution:

Hinz initially analyzed the existing plant systems, and prepared a study which defined a project scope and budget. The project scope included retrofitting control processors, HMI terminals, instruments, and communications networks. The decision was made to replace all existing underground control wiring with new overhead cables based on TECK cable and trays.

Hinz worked closely with MUD personnel to define the system configuration and select control components. Hinz prepared and issued specifications, prepared bid analyses, and assisted MUD in the final selections. The open system design concepts allowed the control processors, the HMI software, the instruments, the computers, and the network equipment to be bid separately.

The scope of Hinz included the following design and implementation tasks.

- Generation of new P&ID's.
- Analysis of instrument and I/O requirements.
- System configuration and redundancy design.
- Preparation of all bid packages and selection

of component suppliers.

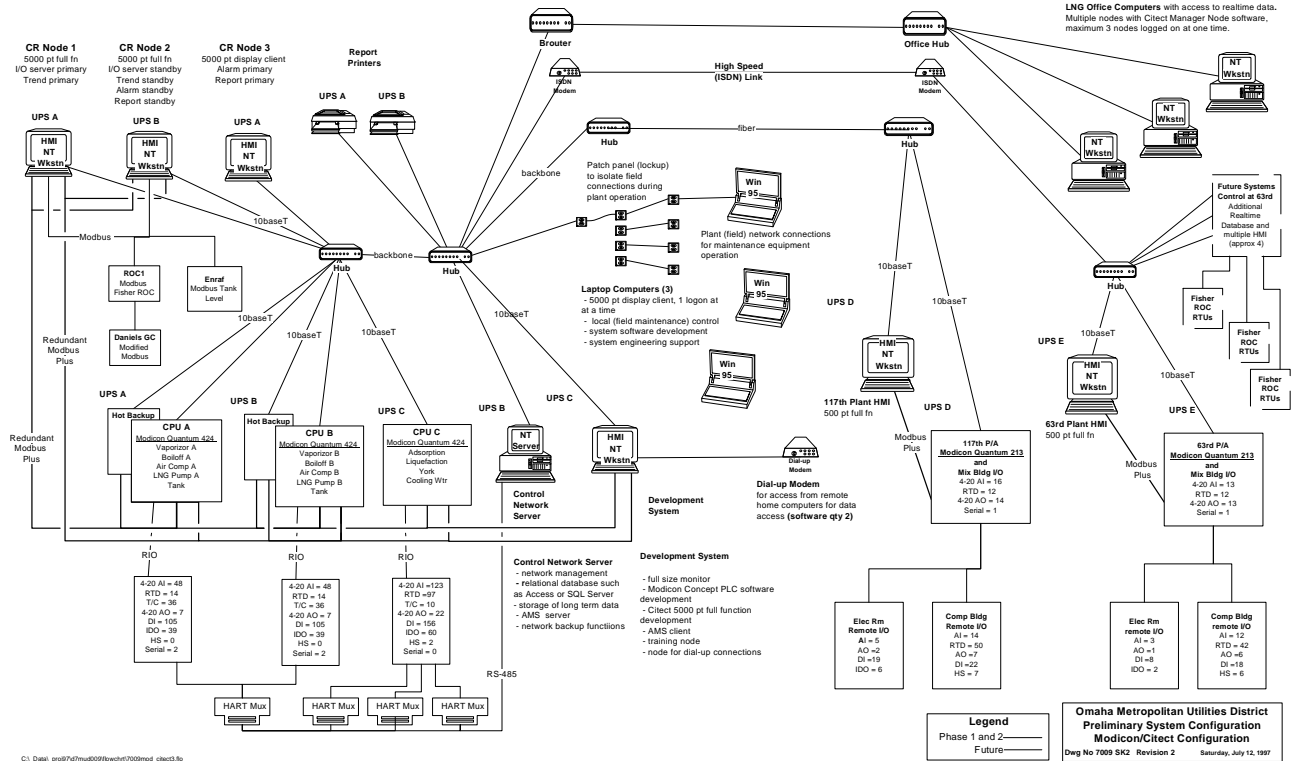
- Preparation of all construction and maintenance drawings, including tray routing, tray support structures, I/O loop drawings, panel drawings, motor schematics, etc.
- Generation of software standards for control software and HMI screens.
- Generation of operational descriptions for all subsystems.
- Programming, testing and commissioning of all software.
- Construction supervision.
- System tuning and responsibility for overall operation.

The system was designed using non-proprietary, open system components including Pentium computers, Windows NT operating system, TCP/IP networking, IEC 1131-3 control software, HART instruments, and other standard equipment. In addition to the control room terminals, system information and reports can be accessed from remote sites, office managers nodes, and intranet.



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## System Specifications:

- Modicon Quantum PLCs with Concept (IEC 1131.3) development software
- Redundant CPU's on critical systems
- Redundant control of plant-wide equipment
- Redundant Modbus Plus networking
- Redundant HMI servers
- Citect HMI software with a client/server architecture
- Ethernet (TCP/IP) networking to multiple locations, including high speed inter-site links
- Asset management software supervising HART instruments
- Approximately 1500 system I/O
- Class 1 Div 1 and Div 2 electrical design including TECK cabling with XP connectors
- Data links to office networks and external SCADA system
- Relational database data storage and retrieval

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

[www.hinz.com](http://www.hinz.com)