



A Rockwell Automation Company

Alberta Energy Company / EnCana / Terasen Platte Pipeline Hiawatha Station Power Upgrades

The Client:

The Platte Pipe Line Company was assembled by Marathon Ashland Pipe Line LLC and other small investors and began operation in 1952. In 1996, Alberta Energy Company (AEC) purchased the Platte Pipe Line Company on the premise that Marathon Ashland would revitalize and operate the pipeline for AEC. In 2002, Alberta Energy Company and PanCanadian merged to form EnCana, creating one of North America's leading independent oil and gas companies with an enterprise value of approximately US \$35 billion. In

January ,2003, Terasen Pipelines was formed as it took over operation of both the Platte Pipe Line system and Express Pipe Line system from EnCana.

Terasen Pipelines is the current operator of the Express and Platte Pipeline system. Covering a total length of 932 miles, the Platte Pipeline transports crude oil through 19 pump stations on its 20" diameter line between Casper, WY, and Wood River , IL.

The Requirement:

For the transportation of crude oil, the Platte Pipe Line was originally designed and constructed with a rated capacity of approximately 150,000 US barrels per day. In the early 1980's when the slumping oil production in Wyoming and Montana hit the oil industry hard, the Platte Pipe Line Company was forced to reduce delivery through the pipeline to a fraction of the capacity.

As demand for crude oil increased again in 1996, Alberta Energy Company purchased the Platte Pipe Line Company

and began revitalizing the pipeline. Inoperative pumping stations were restored and existing operational stations were upgraded to achieve a projected throughput of approximately 180,000 US barrels per day.

Hinz was contracted to provide Electrical Engineering services and support for the revitalization effort, including new control system and electrical power system upgrades.

The Design Solution:

One of the first stations to be refurbished on the eastern portion of the pipeline was the Hiawatha Station in Kansas. Kansas Light and Power Company had provided incoming power service to the Hiawatha Station at 34.5kV, along with a step down transformer for the conversion from 34.5kV to 2300 Volts. Hinz provided extensive data to the utility company convincing them that a 4160 Volt, grounded-Y system was actually a safer design. Thus, the transformer secondary was reconnected as a 4160 Volt, grounded-Y system, with a neutral grounding resistor. The KL&P utility transformer was closely coupled to the existing outdoor switchgear owned by Platte Pipe Line. Hinz redesigned the connection interface at the transformer to allow the new 4160 volt system to be installed. The interface designed by Hinz allowed for safe cable terminations, installation of secondary surge arrestors, ground fault sensing relay equipment, and the neutral grounding resistor.

Platte Pipe Line had requested that Hiawatha Station be kept operational while the modifications were being completed. Hinz indicated that this would not be possible due to the extensive power system upgrades needed. Hinz proposed an alternative that would lower the down time from the previously estimated 2 weeks to 1½ days, and this plan was

adopted. During the 1½ days, the utility company reconnected the secondary side of their transformer from the existing delta-system to the desired Y-configuration. Concurrently, Hinz oversaw the installation as the contractor converted one of the machines from 2400 Volts to 4160 Volts and reconnected the existing control wiring.

Other upgrades at Hiawatha Station by Hinz included the installation of a new station-wide grounding system to eliminate spurious instrument related problems. A Power Factor Correction Capacitor (PFCC) was installed to improve the station operating power factor. The station transformer was upgraded to a 300 KVA oil-filled type. A new Modicon Quantum PLC was installed for station control and for capacitor bank control. Programming of the PLC was performed by Hinz. A new Bentley Nevada Vibration Monitoring System was installed, along with new analog and control cables. All cables and connectors were specified by Hinz. All 4160 Volt power cables were replaced with Teck-90 cables to simplify and reduce the installation time.

Hinz provided all required documentation to define and outline the design changes to both the electrical and the control system project installation work.



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System Specifications:

Hinz Provided Design and Construction/Installation Support for the following:

- Design of New 4160V Electrical Power System and Transformer Upgrades.
- Design of New Grounding Grid System.
- Design of New Power Factor Correction Capacitor Bank.
- New Oil-Filled 300KVA Transformer for Low Voltage and Station Utility System Loads.
- Miscellaneous 480V MCC and 480/120VAC Auxiliary Transformers.
- New Bentley Nevada Vibration Monitoring System, including new cables.
- New Modicon Quantum PLC, including Logic Programming.
- Power System Design, Control Panel and Control System Design.
- Cable and Conductor Specifications.

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

www.hinz.com