



A Rockwell Automation Company

## Alberta Energy Company / EnCana / Terasen Platte Pipeline Guernsey Power System Upgrade

### 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:

The pipeline reactivation work performed by Hinz at Guernsey Station located in Guernsey, Wyoming, began with the installation of a new 34.5kV substation. The new Hinz design would convert the station and machinery from 2400 Volts to 4160 Volts, consistent with upgrades on other pipeline stations. In order to keep Guernsey Station operational while the upgrade work was in progress, the utility company was asked to provide a second 34.5kV incoming power line. While the new power line was being installed, Hinz directed and coordinated the electrical contractor's work to install the new main substation transformer rated at 34.5kV-4160Y/2400 Volts, 5000kVA with neutral grounding resistor, and the dead-end structure. The new dead-end structure included lightning rods, 36kV station class lightning arrestors, suspension insulator assemblies, 34.5kV power fuses and fuse-holders, and disconnect switches.

Concurrently, the contractor was also installing a new station switchgear building. The building was a 14ft by 50ft heavy wall building made with structural steel tubing and cladding design. Along with heating, lighting, grounding, and a full-length electrical cable tray, the building housed the 1200A, 4160V medium voltage main breaker and direct-line starters for each of the three units. The building also housed the 4160

Volt, 600KVAR Power Factor Correction Capacitor Bank (PFCC) used to maintain system voltage and enhance power quality. New panels were provided in the building for utility metering components, the Modicon Quantum PLC system, and the UPS system.

A new oil-filled 500KVA, 4160-480Y/277 Volt Main Station Yard Transformer was installed, along with a new oil-filled Tank Farm transformer rated at 1000KVA, 4160-480Y/277 Volts. The tank farm transformer was used to provide service to the five 250 HP Booster Pump motors and the Tank Mixers. The station upgrade also included the installation of a new station-wide grounding system to eliminate spurious instrument related problems.

The new power system was installed and connected to one "off-line" unit while the other two units were kept operational. When the new power system was ready, the new substation, feeders, and switchgear were cut-in, and Guernsey Station became entirely operational on the new equipment. Thus, except for the momentary power line change-over, the project upgrade work at Guernsey Station had essentially zero station down-time. The old equipment was removed from the site after all upgrades were completed.



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### System Specifications:

Hinz Provided Design and Installation Support for the following:

- New 34.5KV Station Substation, with 5000KVA, 34.5KV-4160Y/2400 Volt Transformer, station class lightning arrestors, and Neutral Grounding Resistor.
- New Substation Dead-End Structure included lightning rods, suspension insulator assemblies, 34.5KV power fuses and fuse-holders, 34.5KV Disconnect switches.
- Three 900 HP, 4160V Unit Pump Motors; Five 250HP, 480V Booster Pump Motors.
- New Station Yard Transformer, 500KVA 4160-480Y/277 Volt.
- New Tank Farm Transformer for Booster Pumps/Tank Mixers, 1000KVA 4160-480Y/277 Volt.
- New 4160 Volt 600KVAR Power Factor Correction Capacitor Bank
- Design and Installation Support of New Electrical Switchgear Buildings.
- Installation of New Modicon Quantum PLC, including Logic Programming.

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

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