



A Rockwell Automation Company

Interprovincial Pipe Line Inc. SEPII Line 1 Unit Additions

The Client:

Interprovincial Pipe Line Inc. (IPL) owns and operates a pipeline network spanning from Norman Wells, NWT to Montreal, Quebec. They are the longest petroleum transmission pipeline utility company in the world. IPL's entire system consists of 7213 miles of pipeline linking western Canada to refining centers and

markets in eastern Canada and the Midwestern United States. IPL transports NGL, refined products, gasoline, diesel, light, heavy and synthetic crude oil. The entire system is controlled from IPL's control center headquarters in Edmonton, Alberta.

The Requirement:

To increase the capacity of IPL's refined products line. The system expansion program II (SEP2) modification was developed. The market production shift in Western Canada is away from transporting light crude to shipping heavy crude and refined products. The increase in throughput of refined products from Alberta required new stations at Strome, Alberta, Cactus Lake, Saskatchewan and Bethune, Saskatchewan. Weak power grids and power savings from not throttling pressure made the variable frequency drive (VFD) a necessity. Power harmonics

created by existing current sourced drives have been a problem at IPL's sites.

The new VFD sites must have voltage and current THD < 3%. The new sites required three motor-pump combinations while savings are found by having only one VFD. Transferring units while running from the VFD to the bypass bus and back again is needed in the control program. The transfers should be simple for the operator in the control room. Pressure set points should be maintained at all times.

The Design Solution:

Hinz was hired by IPL to provide control engineering for the new (SEP2) stations. Detailed design, controls equipment specifications, controls programming, testing, field support, commissioning and documentation were provided by Hinz. About 60 CAD drawings were created/modified for use in the new stations. Next the Modicon PLC automation equipment was specified by Hinz. IPL specified the Robicon Perfect Harmony voltage sourced VFD because reliability and low harmonic content were required. At the new sites the programmed control solution included synchronous running transfers of units (Motor Pump Combinations) from the VFD bus to the bypass bus and back to the VFD bus as necessary. Operation of the new stations were simplified by line operators sending only stops/starts with the station PLC controlling when the unit transfers were required. During the transfers pressure control to set points was maintained by the pressure

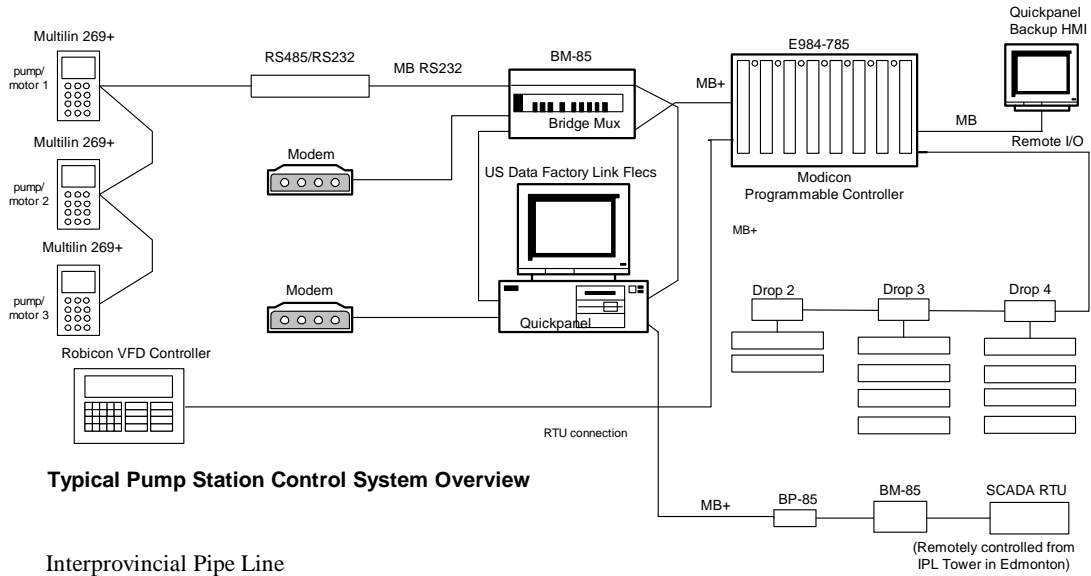
control valve which was used as a shadow pressure protection device. The control program also includes all station controls such as density, pressure, temperature, flow, fire and gas protection and motor protection instrumentation.

In addition to the Robicon VFDs and Modicon PLCs the FactoryLink Windows NT Human Machine Interface (HMI) and QuickPanel backup HMI were included at each station. Typical station operation is from IPL's Edmonton control center via an RTU connection from the station PLC to IPL's SCADA network. The commissioning progressed in steps whereby stations were placed into service and then the VFDs were tested and placed online. To follow IPL's throughput schedule, the commissioning locations and times were set by IPL and met by Hinz.



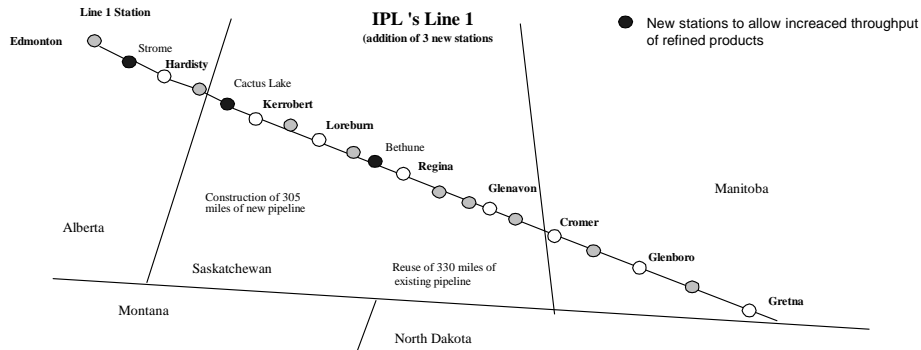
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Typical Pump Station Control System Overview

Interprovincial Pipe Line System Expansion Program II



System Specifications:

- Modicon E984-785 PLCs, BM-85, BP-85's
- Multilin 269 Plus Motor Protection Relays
- IRD Vibration Equipment
- Robicon Variable Frequency Drives
- US Data FactoryLink ELS
- Power Measurement ACM 3720's
- Milltronic Level Indicators
- QuickPanel HMIs
- Yokogawa transmitters

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

www.hinz.com