



A Rockwell Automation Company

## Interprovincial Pipe Line Inc. Cromer Line Heater

### The Client:

Interprovincial Pipe Line Inc. (IPL) owns and operates a pipeline network spanning from Norman Wells, NWT to Montreal, Quebec. They own 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 Midwest United

States. IPL transports NGL, refined products, gasoline, diesel, light, heavy and synthetic crude oil. The entire network is controlled from IPL's control center headquarters in Edmonton, Alberta.

### The Requirement:

In order to meet increasing demands for product throughput by shippers IPL has used a variety of means to increase pipeline capacity. These methods include new pipelines, new pumping stations and additives to reduce viscosity. In 1996 IPL decided to use a large heater in Cromer, Manitoba on its Line 2 to increase the oil temperature, (reduce the viscosity) and in turn increase pipeline capacity.

Large heaters are always complex to control since there are a number of variables which must be adjusted together such as product flow through the heater, fuel flow to the burner, and air flow. In addition both environmental and fuel efficiency requirements must be met at the same time.

### The Design Solution:

Hinz was assigned the task of providing the overall heater controls in the Cromer station and to assisting the Born Canada programmer in integrating the Born burner controls in to the station control systems. Hinz developed the advanced heater controls including: PID controls, start up sequence, shut down sequence, data table to IPL SCADA system in Edmonton, operator interface and alarming. The heater is designed to heat crude 8.7°C at a flow rate of 349<sup>3</sup>/Hr. on a 24 inch pipeline. The capacity of the heater is 50M BTU/Hr. (14.7MW). The pressure drop through the heater is approximately 10PSI at full flow.

The control system is based on a Modicon Quantum programmable controller and uses a small LCD QuickPanel display for local control. The system is interconnected to the Cromer terminal operator stations and to the IPL control center in Edmonton.



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The screenshot displays the 'Heater Controls' HMI interface. It features several functional areas:

- Top Bar:** Heater ESD, Trends, Manual, Exit
- Left Panel:** Schematic diagram of the heater system with components like 'Line 2E - Section', 'Inlet', 'Burners', and 'Outlet'.
- Control Buttons:**
  - START Heater
  - STOP Heater (Pilots and Burners Off)
  - STOP Main Burners
  - Execute
- Operating Metrics:**
  - Operating Efficiency: 0 %
  - Operating Cost: 0
- Valve Controls:**
  - Isolate Heater
  - De-Isolate Heater
  - Execute
- Mode Control:**
  - RTAP Remote
  - BMS Local
  - RTAP Remote
  - Execute
- Oil Outlet Temp Setpoint Ramps:**
  - Slider: 12.4
  - Oil Temp: -10 degC
  - Oil SP: -10
  - Execute
  - Dis/Enable
  - Disabled
- Differential Temp Setpoint Adjust:**
  - Slider: 5.2
  - Diff. Temp: 0.1 degC
  - Diff. SP: 0.1
  - Execute
  - Dis/Enable
  - Disabled
- Stack Temperature Setpoint Adjust:**
  - Slider: 249
  - Stack Temp: 252 degC
  - Stack SP: 360
  - Execute
  - Dis/Enable
  - Disabled
- Damper Setpoint Adjust:**
  - Slider: 43
  - % Closed: 1
  - Damper SP: 0
  - Execute
  - Auto/Man
  - Manual
- Right Panel (Process Data):**
  - Inlet Temperature: -10 degC
  - Outlet Temperature: -10 degC
  - Arch Draft Pressure: 1 mm
  - Arch Oxygen Level: 0 %
  - Combustion: 60 ppm
  - Average Tube Temperature: 101 degC
  - Differential Pressure: 0.4 PSI

## System Specifications:

- Modicon Quantum PLC
- LCD Quick Panel Local Display
- RTAP Host Software

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

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