



A Rockwell Automation Company

## JTG Technology & Information Heating & Vent Control for Enbridge Tar Island

### The Client:

Enbridge Pipeline Inc. owns and operates a pipeline network spanning Canada from Norman Wells, NWT, to Montreal, Quebec. They own the longest petroleum transmission utility company in the world. Enbridge'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.

Enbridge transports NGL, refined products, gasoline, diesel, light, heavy and synthetic crude oil. The entire system is controlled from Enbridge's headquarters in Edmonton, Alberta. Heating and vent control was installed at the Tar Island Pump Station in Fort McMurray, Alberta.

### The Requirement:

The temperature inside the electrical switchgear building required regulating due to the waste heat given off by an air-cooled Variable Frequency Drive (VFD). The VFD is used in a pump station to vary pressure in the pipeline to operators' set points. It was desired to keep the temperature inside the electrical switchgear building at 20°C using the waste heat given off by the VFD. In addition to the heat given off by the air-cooled VFD, four unit heaters, one in each corner of the building, were available to help regulate the temperature.

To maintain a consistent temperature throughout the building four vent fans were available to move air

inside the building. One fan was to be always running to ensure air circulation. Four motorized louvers allowed fresh air to be drawn in, stale air to be vented out, or air to be re-circulated. The four louvers consisted of an air inlet louver, an inlet re-circulation louver, an outlet re-circulation louver, and an air outlet louver.

When combustible gas is detected outside the ESB, the system shuts down, turning all fans off and closing the louvers.

### The Design Solution:

A Modicon Compact PCE 984 A141 PLC was installed on site to control the system. The inputs into the PLC consisted of temperatures inside and outside of the building, combustible gas detection, speed of the VFD, and status of all four fans and heaters. The system controls the number of fans running and the position of the louvers to achieve the desired temperature.

The system operates in two main modes, Winter Mode and Summer Mode. In Winter Mode, the louvers are minimally opened and wasted heat given off by the VFD is circulated to warm the building. In Summer Mode, the louvers open more to let fresh air in and vent warm air out. Manual override modes were also developed to allow venting or re-circulation at any time. Under normal operation, the system positions the louvers depending on the inside and outside temperatures to maintain the desired temperature

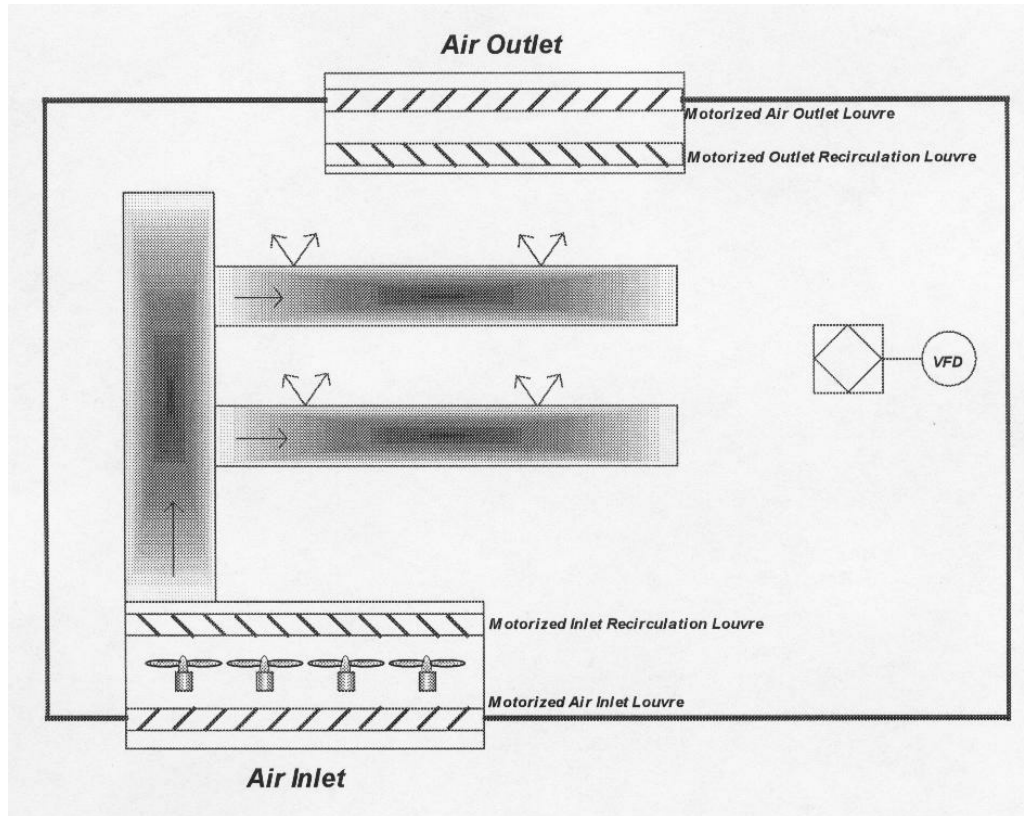
inside the VFD building. In the event of a heater malfunction that causes the temperature inside the building to drop below 5°C, the inlet and outlet louvers close to preserve warmth.

To minimize energy consumption, the number of fans running at a time was determined by the speed of the VFD. The fans are used to circulate warm or cool air inside the building. Since the amount of heat generated by a VFD is proportional to its speed, the number of fans running is also proportional to the VFD speed. It was determined that one fan would operate all the time, and an additional fan was added when the VFD reached 75% of maximum speed. A third fan was added when the VFD reached 80% speed and the fourth and final fan was added when 90% of the VFD maximum speed was attained.



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### System Specifications:

- Compact PLC 984-A141
- Robicon Air Cooled Perfect Harmony VFDs
- Honeywell Automated Louvers

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

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