



A Rockwell Automation Company

Freshwater Fish Marketing Corp. Ammonia Refrigeration Plant

The Client:

Freshwater Fish Marketing Corporation is a federally operated fish processing plant which processes most fresh water fish caught in Western Canada. Products include whole dressed, filets and other processed fish

products. The fish is marketed across Canada and around the world.

The Requirement:

The Freshwater Fish Marketing Corporation wished to upgrade the control and monitoring of its ammonia refrigeration plant to reduce electrical energy consumption. The upgrade was to be performed under Manitoba Hydro's Power Smart program. Besides monitoring power demand for the plant and shedding various loads when required to keep power demand charges low, the project also consisted of taking over

four main functions: Operation of Evaporative Condensers, Operation of Ammonia Vessels, Operation of High Stage Compressors, and Operation of Low Stage Compressors. Hinz was retained to develop a control system to provide the functionality required.

The Design Solution:

The control system for the Power House runs on an Allen-Bradley PLC 5/30 with an Allen-Bradley PanelView plant floor terminal and an Allen-Bradley ControlView station used for operator interface and the generation of alarms and reports. Allen-Bradley Block I/O modules are utilized for handling compressor I/O. Equipment in other areas of the plant is connected via DH-485 and a DH+ networks which communicate with the new PLC. Allen-Bradley Bulletin 1400 Power Monitor units are used to monitor power consumption at four locations in the plant. FES Compressor Control Panels are installed on three of the compressors which they help control. They communicate with the PLC for start/stop commands.

The upgrade consists of controlling and monitoring the Evaporative Condenser and its 4 fans and 3 pumps, the 3 Ammonia vessels and their 6 pumps and Dump system, the 7 Low Stage compressors (1 PLC-controlled, 2 FES-controlled, 3 manual only), the 6 High Stage compressors (6 PLC-controlled, 1 FES-controlled), the 2 de-superheater units, and all freezers

and coolers. The Evaporative Condenser pumps and fans start up and shut down in sequence based on pressure. Sequence order automatically changes to equalize wear on the equipment. Low Stage compressors start and stop in a primary/secondary configuration based on pressure. High Stage compressors also start/stop based on pressure. The start/stop sequence is ordered to make the system as efficient as possible and to keep the power demand peaks down.

Power consumption readings from units at Distribution A and B are added for load-shedding control. When the operator-settable High Power set point is exceeded, freezer units are shut down in sequence via the DH-485 network with the most vital units being the last ones shut down and the first to be re-enabled once the power consumption readings drop back to acceptable levels.

