



A Rockwell Automation Company

McCain Foods Ltd. Power System for Calgary Juice Plant

The Client:

McCain Foods Ltd. Calgary is part of the McCain Foods Group of Companies in Canada. Head office is located in Florenceville, N.B. The Calgary Juice Plant produces fruit juice from concentrate in 125 ml,

250 ml and 1 liter sizes which are McCain brands and private label. The 125 ml packs are McCain brands only.

The Requirement:

The Calgary Juice Plant mixes a variety of ingredients to produce various flavors of both juices and drinks in 1 liter, 250 ml, and 125 ml packages. Standard ingredients including water and liquid sugar are automatically controlled on a batch basis. The aseptic process is air pressurized to prevent the ingress of bacteria into the product. This requires strict sequence control of valve operations to prevent individual product intermixing and loss of product sterility. Individual batches of flavors are operator selected and

initiated and are individually processed through heating and cooling exchangers en route to the product fillers. Clean In Place (CIP) facilities require the control of numerous cleanse and rinse cycles for all tankage, valving, and piping to ensure sterile environments for production. The plant integrates control of the process with control of the plant refrigeration and general building space heating and cooling. Control is located in one central control room where the operator can control the entire facility.

The Design Solution:

McCain Foods Ltd. is a strong supporter of Allen-Bradley motor control products, variable speed drives and PLCs. As well, their North American facilities have utilized Westhead Graphics as their operator interface. The Calgary Plant control system consists of an Allen-Bradley PLC 3/10 Data Highway connected to two PLC 2/20's which are located onboard the filling machines performing local machine control while providing major interlock and status information to the PLC 3/10. The PLC 3/10 has 7 remote racks distributed throughout the plant. One of the remote racks utilizes a PLC 5/15 configured in rack adapter mode. This PLC executes all PID closed loop control for the process totaling 10 PID loops. Two I/O racks are located in the electrical room and are directly interfaced to control the 70 plant motors. Four additional racks are located in process areas interfacing directly to process end devices and some 130 valves. Weigh scale interfaces via ASCII basic modules are provided to 6 Toledo scales weighing mix and aseptic surge tanks for control of product transfer and batch

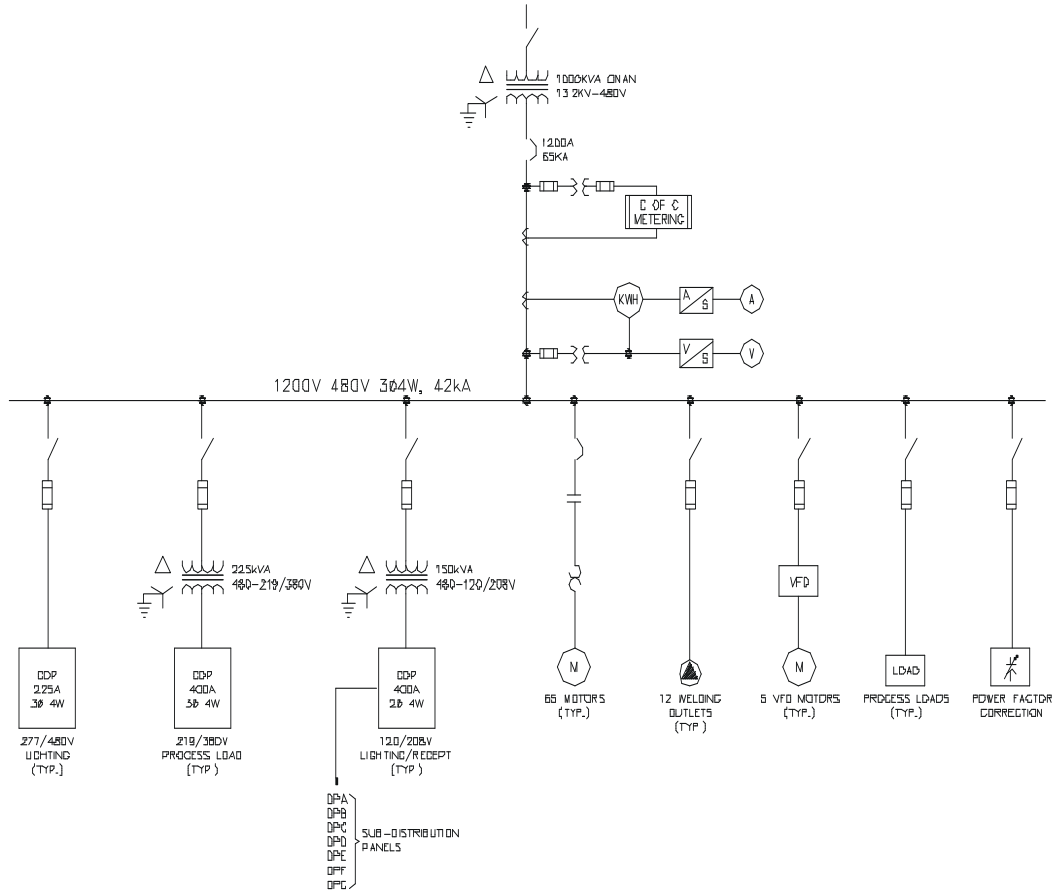
mixing. The Westhead graphics unit provides the operators with over 20 pages of process graphics depicting all process elements and parameters. All alarming and operator actions are logged to facilitate tracking of batch sequences and alarms.

Electrical power to the facility is delivered underground by the city of Calgary electrical system at 13.2kV. A 1000kVA 13.2-0.480kV transformer feeds into a 1200A main breaker and 480 V MCC line-up. The MCC sub-feeds 70 motors and various additional process and building loads. Numerous voltages are used throughout the facility. 277/480V is utilized directly for motor load and 277V lighting. A 225kVA transformer sub-feeds a CDP panel board at 219/380V to supply Swedish-based process equipment. A 150kVA transformer is used to supply 120/208V loads such as office lighting, receptacles, and miscellaneous items. All transformers are delta-star connected and are solidly grounded.



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System Specifications:

- 1000kVA, 13.2kV - 277/480V Transformer
- 225kVA, 480 - 219/380V Transformer
- 150kVA, 480 - 120/208V Transformer
- 1500kVA Connected Load
- High Pressure Sodium Lighting
- Allen-Bradley PLC 3/10, PLC 2/20, and PLC 5/15
- Westhead Graphics Operator Interface
- 70 Motors
- 130 Valves
- 800 Digital I/O
- 65 Analog I/O
- Allen-Bradley MCC
- Allen-Bradley Variable Frequency Drives

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

www.hinz.com