



A Rockwell Automation Company

## AEC - West Clairmont Sour Oil / Gas Battery

### The Client:

Alberta Energy Company Ltd. is one of Canada's largest oil and gas companies. Its upstream exploration and production activities are complemented by midstream investments in pipelines, natural gas storage, and gas liquids processing which provide additional solid income. The company is committed to the principle of sustainable development, which has

the combined goals of economic growth and environmental protection.

The AEC Clairmont Battery is a new facility for the initial processing of sour gas and oil from the local gas and oil fields. The battery is located 15 minutes northwest of Grand Prairie, Alberta.

### The Requirement:

The battery's control philosophy centered around single operator control, 8 hours a day, 5 days a week, with unmanned remote operation from AEC's Sexsmith Plant the remainder of the time. The control system was therefore required to operate the facility with a minimum of onsite supervision. The battery was also intended to be a 'flare-less' site. As a result, the control system would have to minimize gas to flare unless alarm conditions dictated otherwise.

Three compressors (100hp, 600hp, and 1500hp) constituted the core of the battery. The control system was required to provide all start/stop and operation of the compressors, as well as all ancillary equipment. The control philosophy dictated that compressor control be designed to allow one operator to restart and load each compressor from the field.

### The Design Solution:

The client provided an Allen-Bradley PLC 5/60 for the control system, while Data Highway Plus was utilized for communications between the PLC and a RealFlex HMI. The PLC 5/60 was mated to three remote I/O racks to provide sufficient space for all control requirements.

The PLC program was divided into 15 files, some of which included PID control, compressor control, software alarms, shutdown control, and MCC Room HVAC system control. Vortex shedding flow meters provided pulse input signals to high-speed counter modules located in the local control rack. The PLC used this information to perform flow total calculations for oil and condensate flows. The PLC program also contained 28 PID loops for control of flow rates, vessel levels and pressures, compressor control, and heat exchanger control.

The 600hp and 1500hp compressors required control

of both a VFD and recycle line. The 600hp compressor utilized upstream suction pressure for start up and loading. Once loaded, the controls automatically switched to maintain upstream vessel pressure rather than suction pressure. The 100hp compressor was equipped with a second mid-stage recycle, in addition to the VFD and first stage recycle. Three separate PID loops provided control in this case. The program was designed such that the inlet recycle line was controlled independent of the VFD and mid-stage recycle. The VFD and mid-stage recycle then operated in the same manner as the other compressors. All compressor control logic provided for automatic unloading of compressors in the event that a Sexsmith signal closed the battery's main gas outlet valve. This allowed the compressors to continue running, in recycle mode, providing faster gas flow start up once the main gas outlet valve was reopened.



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### System Specifications:

- (1) Allen-Bradley PLC 5/60
- (3) Allen Bradley Remote I/O modules
- (140) Discrete Inputs (24VDC)
- (130) Discrete Outputs (24VDC)
- (90) Analog Inputs
- (34) Analog Outputs
- (5) Pulse Inputs

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