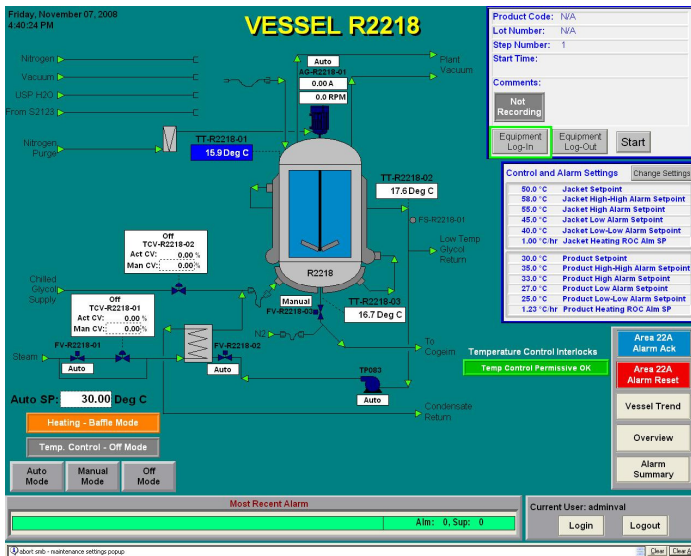*Control Masters Application Case Study*

Process Control System

Technologies
Multiple PLC Configuration
Closed Loop PID Control
Cascade PID Control
Historical Data Logging/Reporting
Fieldbus Device Integration
ODBC Database Logging/Reporting

Services
PLC Integration
SCADA / HMI Integration

Project Description

The objective was to automate the controls on 19 existing reaction vessels as well as 3 new vessels in a pharmaceutical facility. An Allen-Bradley ControlLogix PLC was used to replace existing stand alone single loop PID controllers on the vessels. The vessels were used to distill, concentrate and crystallize products used to make the active ingredients that go into many common pharmaceutical drugs. The system was designed and validated to meet GMP and 21 CFR Part 11 standards.

The existing vessels had steam heated jackets with temperature control valves that controlled the vessel temperatures during heating via closed loop PID control. The new vessels had glycol filled jackets with heating and cooling temperature control valves which were controlled via cascaded PID loops. The vessels were equipped with Endress+Hauser Fieldbus temperature transmitters that monitored the vessel temperature. The Foundation Fieldbus network connecting all the temperature transmitters was configured using Rockwell's RSFieldbus software. The vessel temperatures as well as transmitter status information were brought directly into the PLC from the Fieldbus network via an Allen-Bradley Foundation Fieldbus Linking Device which converts the Fieldbus signal to Ethernet so it can be easily accessed by the PLC. The vessels were located in a hazardous area so all non Fieldbus I/O located in the production area was wired back to remote racks of Allen-Bradley FlexEx I/O modules which are specifically designed to be intrinsically safe for use in hazardous areas. These remote FlexEx racks were then connected via ControlNet to the main ControlLogix rack. In addition there were several Allen-Bradley PowerFlex 70 VFDs connected to this ControlNet network and controlled exclusively over ControlNet.

The system was monitored and controlled by a Rockwell FactoryTalk View SE networked HMI application. The setup included a server computer running the HMI server software and four remote client workstations running client applications. This system also had a Rockwell FactoryTalk Historian SE server performing historical data logging. The Batch Generator Services in Historian were used to collect batch related data which was in turn used to generate batch reports from the HMI. All alarm and FactoryTalk diagnostic data for the HMI application was logged to a remote SQL database where it could be viewed via a Microsoft Access reporting interface.

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