*avid*solutions
Industrial Automation & Process Control

🧪 CHEMICAL

IMPROVED DESIGN SIMPLIFIES OPERATOR INTERFACE

By reducing the amount of code needed for four new product tanks, Avid Solutions was able to create a common HMI interface, which will reduce the amount of future programming changes.

Background

Avid Solutions successfully worked with a local resin and formaldehyde plant during an aggressive timeline to meet the client's goals during plant production. The task was to install automation for four new product tanks in order to increase production capacity and remove obsolete equipment.

Approach

After setting clear objectives with the client, the Avid team was responsible for PLC programming, updating existing HMIs, DeviceNet design and layout, designing the PLC and remote I/O panels, building the panels, interfacing with a heat trace panel, and specifying the ControlLogix PLC UPS system. The new automation was brought into a new ControlLogix PLC, which was configured as a new node on the existing process control network. The ControlLogix PLC communicates information and statuses with six existing PLC-5s on the process control network. The existing InTouch application was updated, which added multiple screens that interface with the new equipment, the UPS system, and display status information of the Ethernet and DeviceNet networks. For each tank, temperature indication, level indication, and a level switch were wired into the ControlLogix PLC using traditional Input/ Output hardware. All 55 valves and seven motors communicate using DeviceNet networks. The status of all the heat trace circuits were brought into the new PLC using Modbus.

In addition to the InTouch application modification for the new equipment, four other InTouch applications were modified to interface with the new equipment. The main approach of the automation of the new tanks was to provide six functions: transfer product from the new tanks to existing tanks; direct production into the new tanks; transfer product to semi-truck trailers; unload product from semi-truck trailers to the new tanks; charge product to two reactors; and charge water to the new tanks. The tasks involved in each function were to open/close the required valves, start/stop the requested motors, and monitor vessel weights. Among the six functions, there were 54 unique transfer paths between the source and destination vessels. The 54 instances were then broken down into 14 separate routines which were programmed using equipment phase logic of the ControlLogix PLC.

Results

By using the equipment phase logic, the amount of code that needed to be written was reduced because the logic for each routine was common to all vessels that interfaced with the routine. This improvement allowed for simpler management of the code and enabled the S88 standards to be used for writing the logic. This provided common HMI interface to the different states used. Avid's team of experts provided a flexible solution that reduced the amount of future programming needed if changes are ever required while also reducing the amount of manually operated actions. Avid Solutions successfully met the objectives and expectations of the engineers and client, who was more than pleased with the operation of their system and the significantly improved bottom line.