

US\$30,000 savings per day! Rework rate reduced from 30% to 0! ProcessLogix ensures super-efficiency at alphaolefins plant

A new ProcessLogix distributed control system at US-based alphaolefins plant saves US\$30,000 per day in reduced rework costs and allows the plant to operate at 105% of its theoretical maximum.

Background

When a major global petroleum group purchased a US-based alphaolefin plant in 1998, it was using the same pneumatic controls and relays that had been installed when the plant was built 30 years earlier.

The petroleum company did not realise how difficult the plant was to operate using this control system. "We didn't know we had so many things broken," says the company's instrumentation and electrical engineer at the alphaolefin plant. "We had valves that didn't stroke all the way, relays that were failing, and relays that had been jumpered around years ago."

Challenge

The main problem with the legacy control system was that it had no feedback nor any human machine interface (HMI) monitoring system. Since annunciator panels did not always work, operators were not notified when problems arose.

With the pneumatic system, even charging a reactor was an adventure. The operator would open the necessary valves from the control room, then go out into the plant with a hammer or a crowbar. After checking to see if all the valve indicators were in the proper

position, the operator used the crowbar to open sticky valves all the way and check levels in the reactor vessels with a sight glass.

A chart on the control room wall listed optimum values for charge time, oxidation times, and fill rates, but the operators had no way of monitoring these parameters. "On our best days, we operated at about 75% of capacity," says the alphaolefins plant site engineer. "With a rework rate of about 30%." Sometimes the bad batch could be reused but, in many cases, the reactor vessel had to be shut down.

Solution

With the help of Control Dynamics Incorporated (CDI), a local systems integrator, the petroleum company installed a Rockwell Automation ProcessLogix control system at the front end of the alphaolefins process.

The ProcessLogix system controls the activities of three batch reactors, all of which make the same product. The process involves filling the reactor vessel with titanium oxidizing the mixture with air that is blown in from the bottom during agitation. The system must very tetrachloride and



ethylene, then carefully control the airflow, because the mixture should build up heat but not catch fire.

Results

All the reactors now run at top speed under the new ProcessLogix control system. "We are running this process as fast as possible for the first time in its life," the site engineer says. "In fact, we are actually operating at 105% of the theoretical maximum production rate."

At the time of writing, the rework rate remains steadfastly zero because the new ProcessLogix system has simply never made a bad batch. As the reactor's operating cost is around US\$100,000 per day, the reduction of rework rate from 30% to zero equates to a saving of US\$30,000 per day. The new ProcessLogix system detects problems that can be solved with preventive maintenance. For example,

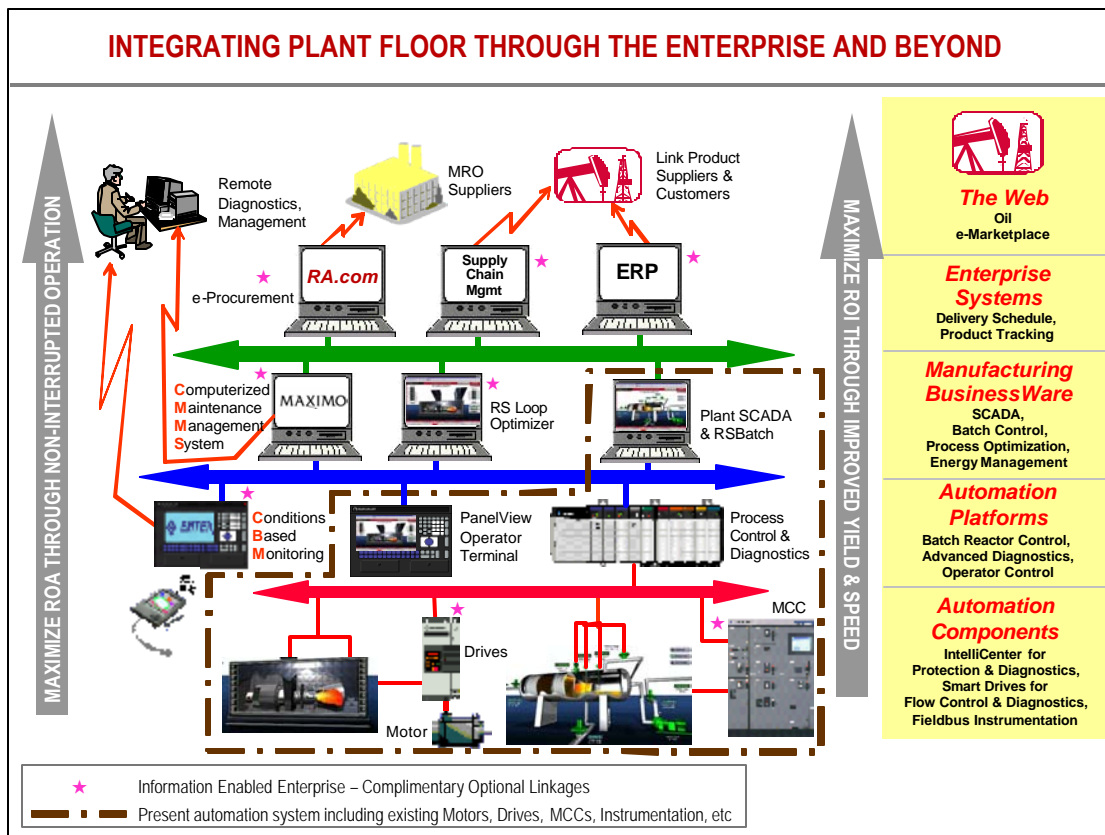
the software can detect when an agitator motor is running hot, when a flow switch is chattering, or a valve is sticking.

The petroleum company is ready to expand the system by installing ProcessLogix systems in other parts of the plant. Immediate projects include a tank farm and several towers currently running under manual control.

The architecture below depicts Rockwell

Automation's concept of an Information Enabled Enterprise. The area outlined with a brown dash line represents the present automation level under discussion in this document. The remaining portion illustrates a host of solutions that Rockwell Automation can provide today to integrate the plant floor through the enterprise and beyond.

Due to reasons of confidentiality, this customer prefers to remain anonymous



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