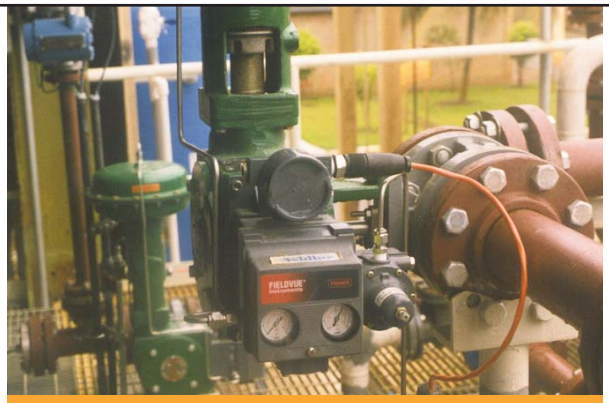
Kemwater-Millennium Chemicals Gains Efficiency and Economic Benefits with the DeltaV™ System and FOUNDATION Fieldbus Technology

RESULTS

- 30% engineering savings
- 40%configuration savings
- 50% documentation savings
- 30% Installation savings
- 30% total project implementation cost savings
- 20% total system cost savings



APPLICATION

Hepta-hydrated ferrous sulfate recovery process.

CUSTOMER

Millenium Inorganics Chemicals do Brasil, Bahia, Brazil

CHALLENGE

Millenium's challenge was the total integration of all the tasks that involve the automation/instrumentation equipment. Among the company's goals were: provision of process data on-line for the entire plant, measurement of energy and production, implementation of statistical process control, quality management, integration with SAP, and maintenance management using asset management software. Millenium is constantly concerned with reducing process variability, with the main objective of reducing variable costs and improving quality. Over 300 variability audits on the performance of control loops in process industries indicate that only 20% of the loops reduce process variability, while the remaining 80% promote an increase. The causes of this inefficiency can be varied: 30% of the loops oscillate and increase variability due to tuning, 30% oscillate and increase variability due to the use of transmitters and control valves with questionable performance, 15% require new control strategies and 5% require new design.

SOLUTION

The choice of Emerson's PlantWeb™ architecture (including Emerson's DeltaV™ digital process automation system and FOUNDATION fieldbus technology) occurred naturally, since it is currently the only architecture that serves the process automation and control plan described above, supplying all the tools necessary to reduce variability along with instrumentation with a proven track record.

"Choosing PlantWeb architecture at Kemwater in Bahia proved to be the right decision. As operations continue even higher earnings are expected. In this case we are referring to the reduction of process variability, percentage of loops in automatic mode, quality of the final product, optimization of yield, and performance of the plant, besides substantial earnings in maintenance."

Divaldo Franco
Millennium Inorganics Chemicals Inc., Bahia, Brazil

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For more information:
www.EmersonProcess.com/DeltaV

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Process Management

The Ferrix-XL3 unit processes hepta-hydrated ferrous sulfate, a by-product of the manufacturing process of titanium dioxide (TiO2), obtaining a product for water treatment with a lower cost than traditional aluminum sulfate (Al2(SO4)3) and a similar performance. The unit is presently undergoing tropicalization, while its product is being introduced in the market successfully. Besides this plant in the state of Bahia, Brazil, the company has another two plants: one in Finland and the other in Japan.

System Architecture

The automation of the Ferrix-XL3 unit requires a mid-sized system with 82 DIs, 65 DOs, 32 AIs, 6 AOs and 8 PID meshes performed on the field. The system includes two standard PC operations stations running in Windows NT and connected to the standard Ethernet network with a TCP/IP protocol. Only one controller is needed for the quantity of I/O at Ferrix-XL3, as seen in Figure 1.

The digital 24 Vcc inputs and outputs include all the on-off valves, motors and level switches. The analog 4-20 mA inputs obtain level data (radar), mass flow and weight, while the analog 4-20 mA outputs are references for the frequency inverters.

When comparing the project using the PlantWeb architecture with traditional architectures comprised of PLCs or SDCDs, there was 30% reductions in the number of HHs necessary for engineering, 40% savings in configuration, 50% savings in documentation, 30% savings during installation, 30% reduction in project cost (without considering system hardware: 40%), 50% in the quantity of document and 30% in cleaning savings during system installation. Taking the dimension of the automation system at the Ferrix-XL3 unit into account, the project brought a total cost reduction of around 30%, without considering the system hardware.

Automation Project Costs

The table (Figure 2) presents the list of costs for comparison of the automation project between PlantWeb architecture and a traditional system comprised of a PLC, Supervision Software and conventional field instrumentation. A 20% reduction in the total cost of investments was noted, making PlantWeb architecture the best option.

Conclusions

Choosing the PlantWeb architecture at Kemwater-Millennium's chemical hepta-hydrated ferrous sulfate recovery plant Ferrix-XL3 proved to be the right decision. As operations continue, even higher earnings are expected. Due to the reduction of process variability, percentage of loops in automatic mode, quality of the final product, optimization of yield, and performance of the plant, in addition to substantial savings in maintenance.

Item	Traditional System	PlantWeb
Total Equipment	100%	85.2%
Assembly/Commissioning	40.8%	25.2%
Assembly Material	32.0%	17.5%
Cables	15.5%	8.8%
Development	11.7%	11.6%
Total Services	100%	63.1%
Overal Total	100%	80%

Figure 1: Overall cost comparison (in %) between the automation project of PlantWeb architecture and that of a traditional system.

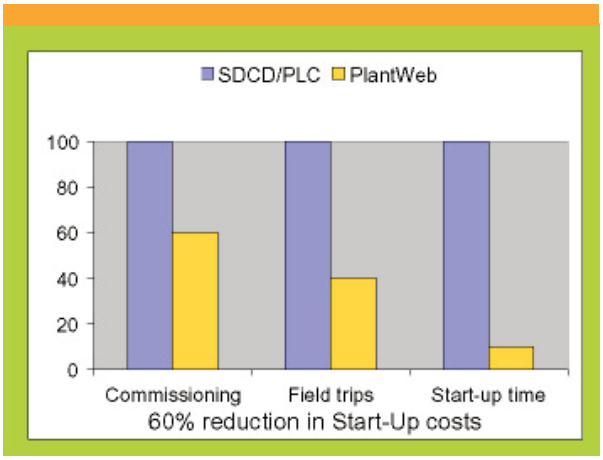

Figure 2: Start up costs comparison (in %) between PlantWeb architecture project and traditional system.

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