

GALP Energia reduces fuel costs by €2.1M/Year using Emerson's SmartProcess™ Distillation Optimizer

RESULTS

- Reduced fuel consumption by 20% (€2.1 million/year)
- Real-time indication of quality parameters
- Improved control stability



APPLICATION

Implementation of Advanced Process Control (APC) on aromatics plant.

CUSTOMER

GALP Energia, Matosinhos Refinery, Portugal.

CHALLENGE

The Matosinhos refinery, located in Portugal currently has an annual refining capacity of approximately 110,000 barrels a day and includes crude distillation, aromatics, base oil, and lubricant units. The refinery is renowned for the production of specialty chemicals. It produces a large variety of derivatives or aromatic products which are important raw materials for the chemical, petrochemical, plastic, textiles, fertilizer, rubber, paint and solvents industries.

In their continuous drive for operational excellence, the refinery management identified a need to improve the variable cost performance of the aromatics unit and identified APC as a potentially cost effective way of achieving this goal.

SOLUTION

Emerson consultants carried out a study on the aromatics plant, the output of which was a report that detailed a set of investment options for improving operating efficiency. The study followed a rigorous procedure including a site walk-through, interviews with key plant personnel and analysis of historical process data. The study report highlighted the need for additional instrumentation, i.e. online analyser, changes required to address existing issues with the regulatory controls and the expected benefits (and cost) of each potential investment option.

On the basis of the total capital cost and the expected return on investment, GALP selected four projects to proceed with in the Pre-distillation, the Arosolvan and the Parex units.

“Emerson has delivered a solution which has exceeded the expectation of all the stakeholders in the project; the operators, engineers and management.”

José Manuel Lluvet Santos
Head of Process Control
GALP Energia



For more information:
www.EmersonProcess.com/DeltaV



To ensure sustained delivery of the benefits of the APC applications, through ownership of the solution and provision of first-line support, a GALP Process Control Engineer was included as a key member of the project team. The engineer worked side-by-side with Emerson's consultants to ensure that the design and implementation of the advanced control schemes were not only technically accepted but were also in line with the project goals and GALP's business objectives. The delivered solution was tailored to fit in seamlessly with the current control strategies on the site, thus ensuring that it was quickly and easily embraced by the plant operators who use it on a day-to-day basis.

As a result of the improved control stability and real-time indication of key quality parameters in the column, the operators are now able to operate the distillation columns much more closely to the minimum reflux ratios while still maintaining on-spec production. This has greatly improved the heat-integration of the columns, thus reducing the amount of energy required for the separation process.

For the APC schemes to work correctly and deliver the expected benefits, the regulatory controls within the scope of the APC must work correctly, i.e. all instruments, valves, and other elements of the control loop are in good working condition and the loops are tuned correctly. Emerson's Advanced Loop Services Consultant was on hand to identify the root cause of oscillations in the underlying controls and retune the poor performing loops prior to the implementation of advanced control.

The advanced control schemes were configured using Emerson's SmartProcess™ Distillation Optimizer. This is Emerson's pre-engineered application for advanced control of distillation columns and is easily customisable for specific instances. It includes custom calculations for distillation columns (including internal reflux, jet flooding, reboiler/condenser duties) and embedded DeltaV™ APC technologies for Model Predictive Control and inferential modelling. The APC tools in a DeltaV system are embedded in the control system, eliminating the computational overheads associated with solutions which require separate hardware, software and interfaces.

GALP's APC schemes run in a dual-redundant mode in the existing DeltaV controllers as they have only a nominal impact on controller loading.

The nature of the material being separated in the distillation columns meant that additional online analysers were required. Emerson supplied and installed the analyser for the Arosolvan unit. Inferential calculations were built for use by the APC in real-time. Its results are updated at a regular interval against the online analyser and lab values.

Following site acceptance, the benefit delivered by the Aromatics Plant APC was audited to be €2.1 Million per year.

Emerson continues to support the installed solution. However because GALP and Emerson worked as an integrated team in delivering the solution, first-line support is provided by the GALP engineering team.



“The skill and professionalism with which Emerson delivered this project in spite of operational challenges ensured the delivery of this successful APC application.”

Rodolfo Oliveira
Process Control Engineer
GALP Energia

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