

# MOL Reduces Energy Consumption using Emerson's Control Performance Consulting Services

## RESULTS

- 19% energy consumption savings (€ 670,000 per year)
- 84% process variability reduction
- 4.3% CO<sub>2</sub> emissions reduction
- Very quick return on investment
- Reduced operator workload
- Improved process stability

## APPLICATION

Gas production plant

## CUSTOMER

MOL Plc. Algyo Gas Plant located near Szeged, Hungary.

## CHALLENGE

The Algyo gas plant includes three columns on each of the two distillation column trains. The gas feed is supplied to both trains via a low temperature exchange and an oil absorption process. The distillation products are Propane, Propane-Butane mix, iso-Butane, normal-Butane, iso-Pentane and normal-Pentane. These are drawn off as top/bottom products from different columns in each train. The quantity and quality specification for each of these product streams changes with demand.

MOL employed Emerson's Control Performance Service to fully exploit the capabilities of their DCS in order to improve plant control and process stability. Emerson's Control Performance Services are designed to optimize the performance of base regulatory control by minimizing variability associated with control strategies, controller algorithms, tuning, field devices and process design.

The main challenges for this application were:

- Diagnosing instrumentation and recommending/applying corrective actions
- Control valve replacements
- Root cause analysis of control problems
- Change of control structure
- Optimal control loop tuning
- Increase operational stability
- Optimize reflux ratios and decrease production variability.



***“Emerson has provided us with an efficient procedure that resulted in a very stable process operation. The final result was an unexpected reduction of hot oil and fuel gas usage.”***

**Attila Bodócs**  
Production Chief, MOL Plc.



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[www.EmersonProcess.com/DeltaV](http://www.EmersonProcess.com/DeltaV)

## SOLUTION

To achieve the required goals, Emerson's consultants carried out a detailed audit of the control loops, valves, and instruments in the Algo gas plant in order to identify areas requiring maintenance, replacement, tuning or redesign. The main focus of the control loop audit was as follows:

- Identify control loops with excessive variability and prioritize them
- Reduce process variability
- Optimize the control loop performance (improved tuning and constraint pushing)
- Loop Scanner Toolkit
- Root cause analysis
- Variability management
- Control and stability analysis
- Statistical regression analysis

Corrective actions on a number of control valves were identified. Implementing the recommended corrective actions resulted in more stable control of the columns, hence reduced variability.

With stable controls and reduced variability, the columns can be operated closer to key constraints where a large safety margin was previously applied to avoid off-spec production. Emerson's consultants performed loop optimization studies to determine the theoretical minimum reflux ratios at which each column can be run and the optimum column temperature profile for each column.

The final audit report contained detailed information on recommended modifications, maintenance work, process improvement and the expected return on investment (ROI) for carrying out the recommended work.

Emerson's consultants were on site to provide any required assistance to MOL as they implemented the recommended changes to the plant and controls. Site work was completed in 5 weeks and benefits realization was instant—starting as soon as Emerson's recommendations were implemented on the first column.

Improved control loop performance resulted in an 84% reduction in the variability of key process parameters. Loop optimization resulted in reduced liquid traffic in the column, hence reduced reboiler duty and heating requirements. This meant that the fired heaters had to be turned down resulting in natural gas saving equivalent to €670,000 per year and 4.3% reduction in CO<sub>2</sub> emissions.

Because the plant operation is more stable, the operators now feel confident about leaving the controller in "auto" mode rather than running the plant manually like they did previously.



***“Plant reliability is greatly improved because operation is more stable and operators leave the control loops in AUTO mode. We saw instant benefit following the audit of the first distillation column.”***

**László Csikós**  
MOL Plc.

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