



The Challenge

Tessenderlo Group is a worldwide corporation committed to excellence and development across all of its business groups. At the core of its plastics converting business Tessenderlo Chemie operates a 270,000 tpy chlor alkali production facility in Tessenderlo, Belgium. In 2006 Tessenderlo Chemie commissioned a new more energy efficient membrane technology cell room and installed R2's EMOS system (Electrolyser Management Optimization & Safety) in order to achieve the highest level of safety and improve management of operations. EMOS immediately proved to be a valuable tool by identifying more than 60 defective membranes just after the plant commissioning in 2006.

Now, with a wealth of data collected and stored by EMOS, Tessenderlo Chemie in cooperation with R2 aimed on improving asset management by turning EMOS data into actionable information that would allow for improved maintenance strategies.

The Solution

R2's Cell Performance Report (CPR) enables the adoption proactive selective maintenance strategies based on the true economic performance of individual cells and their critical components (anode coating, membrane and cathode coating). Operating costs are reduced through detection and replacement of underperformers, as well as identifying and prolonging the lifetimes of better performing elements. Further benefits can be achieved using CPR to test new components or to optimize other strategic projects, such as in situ reactivation of cathode coatings.

Using the historical data stored in R2's EMOS system it was possible to evaluate the performance of the plant prior to the start of the study. Ongoing data analysis throughout the study gave continuous feedback on the effects of the changes that were implemented based on the CPR analyses.

During the study Tessenderlo used the CPR to rank and sort the performance of individual elements within each electrolyser (Figure 1) and also throughout the plant. By setting filters (i.e. maximum savings) Tessenderlo Chemie could optimize maintenance planning while reduced operating costs and increasing the overall production efficiency of the plant.

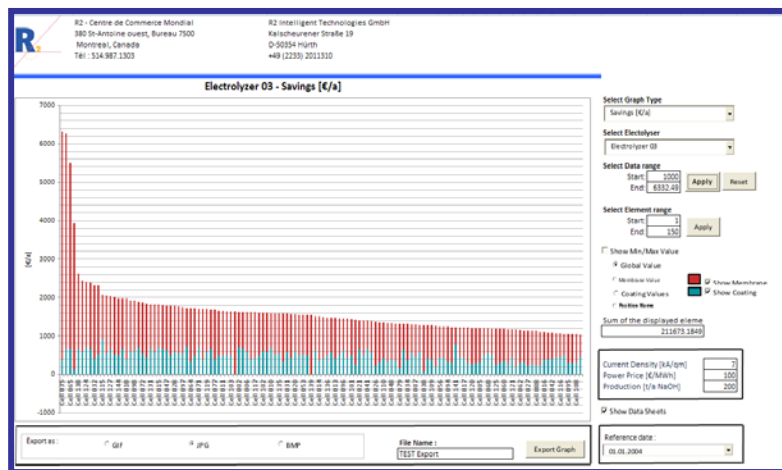


Figure 1: CPR bar chart with elements sorted by performance.



EMOS[®] CPR Success Story

The Benefits

By leveraging the operational data stored in EMOS the CPR gave a precise view of the true economic performance of the chlor alkali plant. This was successfully demonstrated at the Tessenderlo Chemie plant.

Based on this experience and on average data from other EMOS users, expected CPR benefits for a typical 270,000 tpy plant, would enable to:

- Reduce operating costs by **€300,000/yr** through selective maintenance practices (calculated as the difference between additional maintenance costs and typical operational savings).
- Gain additional savings through improved warranty management by identifying correlations between for example manufacturing related problems with coating or membranes and performance data.
- Improve production output by preventing unplanned shutdowns through continuous replacement of underperformers.
- Save more than **€1,000,000** (€125,000/yr) by prolonging the usable lifetime of the better performing components (coatings & membranes).
- Make better decisions when purchasing new components in future remembraning and recoating projects by monitoring the true performance of test cells.
- Improve overall plant safety by continuously focusing maintenance on underperformers that hold higher probabilities of leading to failures.

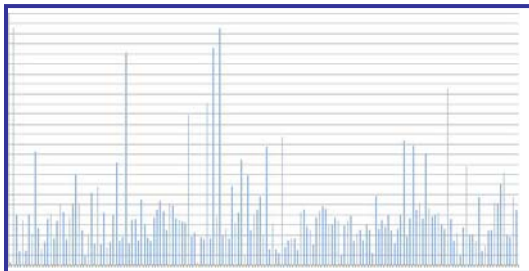


Figure 3: Aging of the plant in terms of SPC (kWh/t NaOH)

Figure 2: Distribution of single element economic performance for one electrolyser.

