Reference case study

Cost-effective evolution of DCI-5000 control system to 800xA with minimum downtime
Zeolite production unit, Prayon, Engis (Liege), Belgium

The Prayon group specializes in chemistry of phosphates and manufacturing of zeolites, hydrated aluminosilicate minerals. At Prayon's zeolite production unit at the Engis (Liege) factory the plant's original ABB DCI-5000 series control system with PCU-2000 controllers had been running the process since it was installed in 1991 — a remarkable 22-year history. In 2013, the plant was facing issues and Prayon's management had to figure out how it was going to support an aging automation system despite facing the challenge of increasing productivity and overall equipment effectiveness (OEE).

Therefore, Prayon asked three potential suppliers to compete for the contract. What were the reasons for ABB winning the business? Didier Poisseroux, project manager at Prayon: "ABB won for commercial reasons but also on technical grounds because the 800xA system is the best!" His colleague, Olivier Bourdouxhe, head of programming, provided more detail: "In addition, ABB knew the old system and was the only competitor to offer us a sufficiently powerful CPU to include all the programming on one single system. Also, a centralized system has advantages both when it comes to programming – it's simpler because there are fewer communications – and in respect of the installation, which benefits from simplified network architecture. It is also easier to maintain and modify, if a process needs to be adapted. Finally, it is more reliable – simpler to manage, it creates fewer risks of errors."

Thorough preparation

It took more than one year to prepare the migration and this provided the opportunity to optimize the process. Alain Ekchian, ABB's Project Manager, added: "When you use a system for twenty or so years, modifications are carried out continuously and, in the end, the documentation is no longer up to date. Reverse engineering was therefore required: data had to be extracted, the program read and translated in the form of a documentary base. As the options for text documentation of the PCUs and PLCs were limited at that period, we were faced with genuine investigative work – the first challenge of this project, which required permanent exchanges between the ABB and Prayon teams. We supplied a description on this basis, which we simplified and optimized. This new description was used to develop the programming for the new system." This subsequently underwent in-depth testing. Two months before migration, while becoming familiar with the new interface via simulation, the operators from the production unit took part in the validation. Also, the team of programmers at Prayon were trained to program the system so that it will be possible to modify it afterwards. Parallel to this, the hardware was prepared (implementation, pre-wiring and PCB testing, etc.) and the new graphics designed.

Successful migration

On March 4 the production facility was shut down to install the new system. Alain Ekchian continues: "The second challenge posed by this project! We only had four days to fit all the wiring: 5,000 input and output signals to remove and 3,000 to refit (bearing in mind the move to a centralized system). The challenge was met thanks to efficiency and the excellent communication with the teams provided by the sub-contractor Fabricom: 33 technicians worked round the clock in teams. The old mimic board has been replaced by three 55" screens and monitoring terminals have been installed: three PCs each equipped with three screens." All inputs and outputs were then tested. Olivier: "We also carried out a few modifications to the program and then we started up, tested and adjusted the installation, one sequence at a time." On March 21 it was successfully returned to the operators.

Multiple improvements

"The current position is that the system has evolved," explains Didier Poisseroux. "We have even started up new a part of the installation that we developed ourselves. Feedback from the operators is positive: they are finding the interface more user-friendly, more intuitive and visually better. All the same, it took the time required to get used to the new system and appreciate all its potential. Today new operators can also be trained quicker and more easily. In addition, thanks to the optimization of the process and installation management, it is now easier to obtain a good quality product than it was in the past and safety has been enhanced." With the old system, manual interventions were used to get round certain problems. The process has been improved to avoid this sort of risk."

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Beneficial exchanges

The collaboration between ABB and Prayon has continued via the contracts for maintenance, providing of updates and servicing. ABB is familiar with the installations and Prayon knows the system, so exchanges are direct and pragmatic. According to Olivier Bourdouxhe: “As soon as you have any concerns, you receive support via the efficient contacts – that‘s important!” And the future? “The other production units in the factory operate with different generations of automation systems and some are equipped with terminals that still run on Windows XP. In view of the fact that Microsoft is no longer supporting Windows XP, we need to replace part of our fleet of PCs. Alternatively, thanks to the 800xA system, it is possible to migrate the control layer only, keeping the existing processors.“

This step-wise evolution approach gives Prayon the flexibility to improve the plant operations over time. ABB works closely with Prayon to prepare detailed evolution plans to enable a smooth execution and a successful completion within a short timeframe.

Project team (from left): Guy Damen, Olivier Bourdouxhe, Didier Poisseroux en Alain Ekchian

About Prayon

Prayon is a fully integrated global phosphate producer headquartered in Belgium, with manufacturing operations in Belgium, France and the United States. Jointly owned by OCP (Morocco) and SRIW (Belgium), Prayon manufactures and markets an extensive range of purified phosphoric acids, phosphate salts and fluorine products that are used in food, fertilisers and a range of industrial applications.

Prayon also manufactures lithium iron phosphate, a cathode material used in hybrid and electric vehicle batteries as well as stationary applications. Prayon is constantly exploring new products designed to serve emerging market trends.
More information: http://www.prayon.com

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