

Success story

Maximum grip on the processes with new Yokogawa DCS



A well-functioning Distributed Control System (DCS), with which a process can be monitored, directed and controlled, is an absolute must for a chemical plant to run optimally. Emerald Kalama in Botlek Rotterdam switched from an outdated DCS system to a Yokogawa [CENTUM VP DCS](#) within three years. The migration has been divided into 39 subprojects and the largest part has been carried out in a rotating plant.

Maarten Post has worked at Emerald Kalama for nearly twelve years, including the time with its predecessor DSM Special Products. "I started as an operator and now work as a process control engineer. I am very familiar with the factory." In 2015 he was invited by Tes Wells, who came to Emerald Kalama five years ago - specially for the migration - to provide input for the migration of the operating system. This was also necessary because the previous system could not be expanded and was no longer supported by the supplier at the time. It was an obsolete DCS system with a very outdated interface. Time for a new system, but of course that could not be settled overnight'.

Intensive DCS selection process

Tes Wells, team leader Process Control department says: 'There were three offers for the setup of a [new DCS](#) . This system is chosen with the goal to work with it for many more decades and, of course, to improve our processes, we visited three providers in person'. Yokogawa became our final choice because of its price-quality balance, their sincerity, customer-friendliness and professionalism. During the presentation it became clear that our case was taken very seriously. They knew the answers to our questions and knew what was important to us. Yokogawa was also an expert in the field of instrumentation

During the execution phase, it was soon realized that that Yokogawa was the right choice. Wells: 'The migration was carried out in close cooperation. The technical support was excellent, and the short lines of communication were pleasant'. A fun and practical side effect for Emerald Kalama is Davy Oosterbaan's decision to respond to an Emerald vacancy. Oosterbaan: 'After my chemical engineering training, I helped with the engineering for this project through Yokogawa. During the test

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phase I worked as an engineer at Emerald for three months. About one and a half year ago Oosterbaan joined Emerald. I collaborate with Maarten and Tes and we complement each other very well. The DCS has no secrets for us.'

About Emerald Kalama

Emerald Kalama's site in Botlek Rotterdam is one of the four production sites worldwide of Emerald Kalama Chemical, an American provider of technologically advanced specialty chemicals. The site is Europe's largest producer of benzoic acid, which is used as a preservative in, for example, light soft drinks, shampoo and sealants. It also produces aromatic (benz)aldehyde, sodium benzoate and benzyl alcohol, among other things. Post: 'The production is highly customer-driven, which means that the quality and composition must be guaranteed at all times. Different techniques - such as oxidation and distillation - are used to arrive at our end products, which are used for a very wide variety: from toothpaste to pancake flour and from cough medicine to special pig food to reduce ammonia emissions. Therefore, the composition is constantly different. This means there is a difference in smell, taste, texture and appearance'. Continuous process optimizations must be carried out. We have never made so many changes to the DCS system before, which led to an efficient production process and cost savings.

User-friendly and intuitive control

Because of the complexity and the condition to disturb the production as little as possible, the

migration was not an easy task. Oosterbaan: 'Fortunately, we knew that we were getting a user-friendly and intuitive system with a similar interface in return. In addition - and this goes without saying - guaranteeing safety was also included in the plan of approach.

Ultimately, the migration was carried out over a period of three years in 39 subprojects in which the process units were converted separately. Each subproject was preceded by a so-called Factory Acceptance Test (FAT), attuned to the Functional Design Specifications (FDS) set by the customer. These took place at the Yokogawa office, in the presence of Emerald Kalama's test team. Wells: 'There were no fewer than 4100 IO points in all subprojects. In 27 projects, the challenge was huge because these were live migrations. The factory kept running and a valve still had to be able to open and close. For the other twelve projects, we were able to organize a temporary stop, which had advantages and disadvantages.

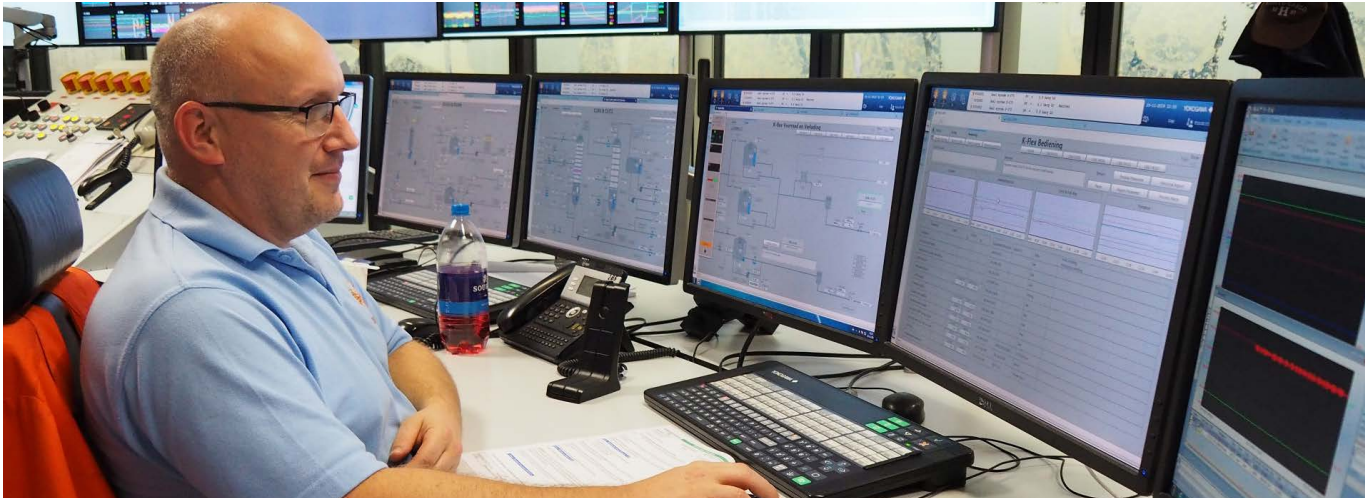
Preference for live migrations

Post: 'With a live migration it is easier to keep an eye on the ball. You see the current values and after the migration they should match. If you transfer values during a stop and these are unexpectedly different, what is the reason? This can be a misalignment during the start-up'. This uncertainty causes extra stress in the start-up phase. That's why we preferred live migrations, although of course this brings other risks.

When transferring a valve, for example, the challenge was to keep it open at an exact percentage, while temporarily you have no control of the valve. Post: 'Together we determined how we could continue to monitor this and stick to this value. We took care of that with the hot cut over tool. This enabled us to prevent a valve from closing when we disconnected the wiring. The Safety Integrity Level (SIL) 1, 2 and 3 scenarios were also re-tested to ensure that the SIL loops functioned according to design'. These tests were part of the Site Acceptance Test (SAT). 'You simulate a failure to see how the system responds to it'.

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New control room

We have been working with the new DCS for some time now, to the full satisfaction of the users. Operator Gertjan van der Knaap admits that it took some time getting used to, but that it is a nice system to work with. I am positive about the setup. You can switch between systems very easily'. Each operator has his or her own preference for the layout of the screens, and that is all possible. There is a large video wall where an alarm is immediately visible. On the smaller screens I keep an eye on the process for which I am responsible; the reactors and the oxidation process. My colleague does the same for the distillation process and the utilities'. The operator keyboards have also improved. You can spill a cup of coffee on them, so to speak. Pretty robust,' says Van der Knaap.

If the operators have any additional questions, they contact Post or Oosterbaan because he knows the factory by heart and has supervised all facets of the migration, it is easy for him to translate this into the system and implement changes himself. Previously, this was completed externally, but the DCS system is so flexible that we can now change it ourselves, which is nice. We are now closer to the factory, which gives us more control over the production process and that's exactly what we want. Therefore we are very satisfied with Yokogawa's DCS'.

More information

Would you like more information?

Please contact your own contact person within Yokogawa or accountmanager Paul Snel via paul.snel@nl.yokogawa.com, +3188 464 1871.