

System 800xA A plus for simulators for the control system in Södra Cell's Värö mill in Sweden



Increasing numbers of pulp mills are using and gaining great benefits from a simulator including their control systems. In 2009, Södra Cell's Värö mill in Sweden commissioned an evaporation facility, and the facility also includes a simulator, where the 800xA Simulator from ABB is connected with a facility model from Andritz AG.

"The simulator is very useful for configuration, test runs and training", says Södra Cell Värö's Control systems Supervisor Tommy Pettersson.

The Södra Cell's Värö mill manufactures paper pulp, mainly for tissue products, and largely for export. In addition to pulp, the mill also produces energy: electricity both for its own use and for sale to the grid, steam for its own processes and heating, and for the district heating network in Varberg city.

Energy production has become more important over time, and Södra Cell has for some years now been running a major project dealing with energy efficiency. The latest stage of the project is a new evaporation facility where the liquor from the digester is evaporated to a higher degree of dried solid prior to combustion in the recovery boiler.

"The objective for Södra Cell Värö is to produce surplus of electricity, district heating and biofuel", says Tommy Pettersson.

The project for the new evaporation facility started at the beginning of 2008. The facility is delivered by Andritz AG and the entire control system is supplied by ABB.

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Hans Stenberg, ABB’s customer manager for Södra Cell Värö, says that the Värö mill has an integrated DCS system for the whole mill based on the System 800xA automation platform with AC450 and AC 800M controllers.

“The new evaporation facility has 800xA and AC 800M controllers and operating stations connected to the rest of the mill”, he says.

Mirrors the control system

The delivery includes a simulator, something that was previously unusual within the paper pulp industry but has seen more in demand in recent years. ABB’s 800xA Simulator mirrors the whole control system’s hardware and software and works with a process model of the mill. The controllers run as Soft Controllers in standard computer hardware, thereby minimizing the hardware and maintenance.

“Working with our own staff and Andritz we have developed a control philosophy and converted it to control system code. A couple of our expert process engineers have created displays for the operator interface”, says Tommy Pettersson.

The simulator arrived in early summer of 2009 and after a few weeks of basic testing the control system simulator, loaded with engineered control, was up and running together with the model.

“We tested the control system code, the displays and the model at the same time and ABB’s simulator platform ensured that it all worked very well.

Since then the simulator has been used for trialling systems and processes as well as for operator training.

“We have been able to test run advanced sequences such as a liquor cleaning sequence prior to commissioning, and tested and refined a number of settings. It is important; it saves a lot of time and effort when commissioning.

Training and education

Most of the time the simulator has been used for training the process engineers. Initially it was 20 or so who worked with the evaporation who were trained for five days each in the simulator.

Södra Cell Värö, ABB and Andritz have collaborated closely to create a simulator for the new evaporation facility. The process engineers can be trained and practice in the simulator. From left Gert Börjesson, trainee Södra Cell, Fredrik Nylén, trainer Södra Cell, Hans Stenberg, ABB, Tommy Pettersson, Control systems Supervisor Södra Cell, Thomas Karlsson, Project manager Södra Cell, Jörgen Börjesson, trainer Södra Cell, and Annika Hemmingsson, trainee Södra Cell.





Tommy Pettersson and Thomas Karlsson, Södra Cell Värö, and Hans Stenberg, ABB (center): “The 800xA Simulator gives fantastic benefits.”

“The process engineers who were involved in developing the system work as teachers. The participants primarily practice on start-ups – it is very important to get the process running again swiftly after a stoppage in any part. They also practice problem solving.

The problems set for the process engineers in the simulator are a number of scenarios with unexpected events. “It may be about the temperature being too high so that some parts of the process are knocked out. What does one do then? It is about restarting as soon as possible,” says Tommy Pettersson.

“Things have gone very well with the simulator and it is very exciting to have been part of it the whole way through. We are probably unique in having tested the whole process with full logic at the same time.

The simulator has been of great value to us both before commissioning and since”, says Tommy Pettersson.

Södra Cell Värö

- The Värö mill is one of Södra Cell’s four pulp mills and part of the Södra group.
- The Värö mill produces 425,000 tonnes per year of high quality totally chlorine-free softwood pulp. The mill has 350 employees.
- The mill is also now after intense investments in its power houses a supplier of both electricity for the national grid of Sweden and district heating to the municipality of Varberg.
- By 2012 Södra Cell Värö will probably be the world’s first pulp mill to be independent of fossil fuels for day-to-day operation.

ABB’s supply

- Expansion of the existing 800xA DCS system with two AC 800M controllers and operator stations for control and monitoring.
- 800xA Simulator including AC 800M soft controllers for replicating the actual system.
- Commissioning of the automation systems and simulator.
- All automation solutions by the mill is supplied by ABB.

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