

Methanol producer with world-class operator environment for full and effective process control

Statoil Hydro's Tjeldbergodden plant is not only one of the world's largest methanol facilities. Thanks to the recent implementation of ABB's System 800xA EOW, it's also at the very cutting edge of process control, ergonomics and energy-efficient production. Today, Tjeldbergodden operators exercise full control of their processes via two large high-resolution displays, helping them prevent expensive downtime and react quickly in the event of a problem.

Statoil Hydro implemented the Elsas Bailey Infi 90 automation system when the Tjeldbergodden plant started operations in 1997. The system has been successively modernised since then, and in 2005, ABB automation system 800xA functions were added to improve the reporting of production history. But it was in 2007 that Tjeldbergodden took a giant leap forward.

Modern 'mission control' environment

"We modernised the operator environment by implementing ABB's Process Portal-concept together with two EOW (Extended Operator Workplace) big screen displays to give operators a better working environment and help them make quick and correct decisions", explains Stein Holsen, process control engineer at the plant. "The operators, 30 in total, are extremely happy with the EOW, and naturally so are we. As several people can comfortably participate in trouble-shooting at the same time, the large displays also speed up error recovery."

At the heart of the operator control room are two interactive, high-resolution, big screen displays with integrated video. The production process is monitored and controlled with as much precision as a space mission!



Outstanding overview on screens and monitors

System 800xA also helps improve tracking energy efficiency. In this discipline, Tjeldbergodden ranks among the best in the world. Images are projected onto the big screens, which are supplemented with four smaller monitors located in two workplaces with height-adjustable desks. The presentation is based on storage technology and process graphics can be displayed on all screens with just two clicks of a mouse. Furthermore, the control room's height-adjustable desks help prevent strain injuries when looking back and forth between the smaller monitors and the large display screens.

Video images integrated with process graphics

"Thanks to video integration, we are able to monitor and control vital processes and integrate images with process graphics on the operator monitors", emphasizes Stein Holsen. "In one of our methanol production processes, the temperature reaches 2000 degrees. To monitor this particular processes, we have integrated IR cameras into System 800xA so that we can track it via IR imaging, as well as logging and controlling its temperature."

“Being able to gradually modernise Infi 90 by implementing selected parts of 800xA was a great advantage, both economically and functionally”, states Stein Holsen.

Even Dromnes and Stein Holsen go walkabout in the Tjeldbergodden plant, which produces roughly 900,000 tonnes of methanol per year, mainly from natural gas extracted from the Norwegian Heidrun field in the North Sea.



Joar Lernes works in the control room at Statoil Hydro in Tjeldbergodden. The production process is supervised with the help of two large-screen, high-resolution interactive displays with integrated video, plus individual operator consoles.



Operators at Tjeldbergodden are trained to use the interactive large-screen displays on special ABB simulators.



Key data storage optimizes quality

System 800xA also allows storage and presentation of KPI (Key Performance Indicator) data. KPI data is used to optimize quality and for economic follow-up, making it an important basis for decision-making.

“ABB Corporate Research helped us introduce a KPI solution to follow-up energy consumption”, explains Stein Holsen. “At a weekly meeting attended by process engineers, operations staff and company management, we run through the key parameters and make the necessary changes to the process.” ABB, who won the operator environment order against tough competition from other leading automation companies, placed great importance on ergonomics during the comprehensive pre-study.

“Being able to gradually modernise Infi 90 by implementing selected parts of 800xA was a great advantage, both economically and functionally”, states Stein Holsen. “In addition, ABB’s expertise in ergonomics and process technology contributed strongly to the design of the new EOW. The company also had sufficient personnel resources to take on such a large project, and was extremely familiar with our processes. We have enjoyed a close dialogue with ABB during implementation, and the team spirit has been excellent throughout.”

Simulator training shortens starting stretch

“System 800xA was first implemented on the simulator that ABB supplied,” explains Trond Tysseland, head of ABB Norway and responsible for the Tjeldbergodden project. “This was used to train operators prior to implementing the EOW in the actual system environment, thereby speeding up its introduction. The simulator worked very well; I used it myself when learning the basics of the methanol process.”

A text-book example

“Tjeldbergodden is a text-book example of the interactive operator environment of the future,” says Per Lundmark, business developer for System 800xA EOW at ABB Sweden. “The interface is intuitive and operators use the same window to navigate, retrieve, display and manage process information in real-time. They are then able to make correct decisions, which, for example, helps prevent expensive downtime.” Most operators use the large display screens to gather and view graphics of the overall process. That the large screens are fully interactive is a big help in this respect.

“But it can also be used to display detailed images when, for instance, several people are involved in the decision process,” says Per Lundmark. The four smaller monitors are usually used for specific process information, e.g. alarms and for following up trends. By using several monitors, operators can access different types of information simultaneously, and at the same time display a diagram on more than one screen. Furthermore, the information on the monitors can easily be adjusted to meet different specialist needs, e.g. maintenance technicians, process engineers and system administrators. EOWs can be installed in existing control rooms without modification, which saves space compared with traditional solutions. The surroundings are also much improved. ABB EOW furniture, for example, is highly robust and boasts a ‘service-life’ that is designed for 24/7 use.

Facts about ABB's deliveries

ABB PCDA and PSD control systems based on Harmony Infi 90 and Conductor VMS operator stations were delivered to Statoil Hydro's Tjeldbergodden plant in 1996. System 800xA, then used for information administration, advanced applications and report generation, was implemented in 2003. New functions have been added successively since then. Today's System 800xA, which now includes process images and alarm management, is used to monitor and control all processes at the plant. In addition, Telcom and CCTV (monitoring cameras) are integrated into the system. ABB has also supplied a system for monitoring temperature using IR cameras and implemented Process Portal from System 800xA.

ABB's commitment also entails designing the control room layout as well as the complete EOW operator environment with its two large-screen interactive displays from CGM, four screen projectors from Norwegian 3DP, as well as 20 widescreen monitors from HP. Each large-screen display measures 3.1 x 8.8 metres in size and has a pixel resolution of 3840 x 1024. Delivery includes robust, ergonomic furniture with height-adjustable desks.

Live Video saves valuable time – especially in critical situations

When Live Video is integrated with System 800xA, the system's unique Aspect Object architecture makes the video function context centric. This means that operators can click on an object, i.e. any device they choose, select 'Video' and view a video image of that object in the correct place on their display.

They don't need to know where the object is in the plant, or where the video cameras are. They don't even have to know which camera videos which device. The savings in time are obvious, especially in critical situations when operators quickly need a visual overview in order to take fast actions.

Facts about Tjeldbergodden

Tjeldbergodden is situated on Norway's North Sea coast, approximately 100 kilometres west of Trondheim. With a production capacity of roughly 900, 000 tonnes per year, the Statoil Hydro plant is one of the world's largest producers of methanol. Its output corresponds to 25 percent of overall European methanol production and 13 percent of Europe's consumption. Feedstock comes mainly in the form of natural gas from the Norwegian Heidrun field in the North Sea.

The plant is also one of the most energy efficient in the world. Carbon dioxide (CO₂) emissions are particularly low.

In addition to the methanol plant, Tjeldbergodden also has a gas liquefaction facility and an air separation plant. The gas liquefaction facility cools natural gas to minus 163°C, at which it turns into a liquid. Liquid Natural Gas (LNG) has a number of uses, including heating buildings. The air separation plant separates air for the production of nitrogen, argon and oxygen for internal use as well as for sale.

For more information please contact:

ABB

Process Automation Division
Västerås, Sweden
Phone: +46 (0) 21 32 50 00
Fax: +46 (0) 21 13 78 45
www.abb.com/controlsystems
e-mail: processautomation@se.abb.com

ABB

Process Automation Division
Singapore
Phone: +65 6776 5711
Fax: +65 6778 0222
www.abb.com/controlsystems
e-mail: processautomation@sg.abb.com

ABB

Process Automation Division
Wickliffe, Ohio, USA
Phone: +1 440 585 8500
Fax: + 1 440 585 8756
www.abb.com/controlsystems
e-mail: industrialitsolutions@us.abb.com

ABB

Process Automation Division
Mannheim, Germany
Phone: +49 (0) 1805 26 67 76
Fax: +49 (0) 1805 77 63 29
www.abb.de/controlsystems
e-mail: marketing.control-products@de.abb.com