

A record-breaking one-hour upgrade



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Complicating matters is Luleå's location, close to the Arctic Circle, where the Baltic Sea freezes during the winter, making it difficult for ships to enter Luleå's harbor and deliver raw material. To ensure continuous production, tons of coke have to be warehoused and managed when sea transportation is cut off. In turn, this places a significant logistics pressure on the plant's process control system.

SSAB Tunnbråt in Luleå, Sweden, is under constant pressure to maintain production volume and quality. But meeting these expectations requires a control system with sufficient capacity for growth. Recently, the coking plant chose to replace its existing system with ABB's Advant Controller 450. The capacity increase, ability to reuse existing infrastructure and a record-breaking one-hour upgrade procedure were only a few of the benefits.

Like any growing enterprise, the SSAB Tunnbråt coking plant in Luleå, Sweden, faces constant challenges. To support the company's production of just over two billion tons of steel per year, the coking plant is responsible for converting imported coal to blast furnace coke. This process takes place in 54 ovens operating year round at temperatures between 1,200 and 1,300 degrees C. At the same time, the coking process generates enough gas to heat all the coke ovens as well as large sections of the city of Luleå.

This enormous reliance on the coking process for industrial gas and public heating means that the process must never stop for more than a few hours. Also, the ovens must never cool down because doing so reduces their life span significantly.



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In the early 1990s, ABB installed three MasterPiece 200/1, replacing old relay technology at the coking plant. The exchange took about a year and the entire IT infrastructure had to be changed. The system proved reliable and cooperation between SSAB Tunplåt and ABB developed nicely over the years.

Urgent need for greater control capacity

However, in more recent years, growing demands on the MP 200/1s clearly indicated that greater control capacity was required. These systems had reached a CPU load of 80%, limiting growth and the ability to install new applications. If the company was going to increase productivity, maintain product quality and environmental standards, while at the same time streamlining the organization, new capacity was direly needed.

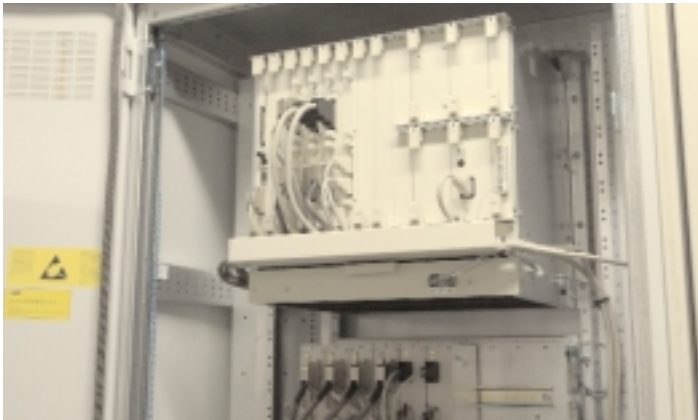
On a more concrete level, the ovens at the plant need to be continuously monitored to avoid unplanned maintenance stops to ensure product quality and protect the life of the ovens. Clearly, SSAB Tunplåt required

a new solution. But exactly what solution should SSAB Tunplåt choose? The SSAB Tunplåt coking plant not only required higher capacity; they also wanted a system that would be easy to integrate with the existing IT environment at the plant, enabling them to retain as much as possible of the existing application programs, wiring and I/O boards.

Using a system similar to the one they had would allow their own personnel to do the installation work, as well as cut down on training and maintenance costs. Equally important, the downtime had to be minimized within a few hours. It was also important that SSAB Tunplåt choose a supplier with process knowledge and with whom they felt comfortable.

ABB was the obvious choice

The obvious choice was ABB because it met all these requirements. The decision was made to upgrade the SSAB Tunplåt process control system from three MP200/1 to three Advant Controller 450, a system that was able to



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reuse SSAB Tunnpålat's existing infrastructure. Specifically, the MP 200 CPU rack was rebuilt to an external rack including exchange of communication cards. The AC 450 was mounted in a new cabinet and the existing controller application, I/O, cable termination and control network MB300 was retained.

Due to the familiarity of the system, SSAB Tunnpålat's own personnel were able to make some changes in the communication systems themselves, as well as create a "lab network" for program verification. All process steps were simulated and tested at the ABB facilities prior to installation at the site. The week before "switchover," both new and old systems were running parallel to verify that everything was in order.

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Some concrete benefits

When the installation was completed, all participants conceded that all requirements were met. Following are some of the benefits achieved by the switchover of the Advant Controller:

- 1** CPU load reduced from 80% to 30%
- 2** Greater capacity to handle more data improves process control and quality output
- 3** Improved ability to follow and manage the entire process more effectively
- 4** Environmentally, better monitoring and managing of coal reduces the spread of dust, especially at a time when environmental concerns are moving to the top of the political, social and corporate agenda
- 5** Improved ability to reprocess waste as raw material for asphalt and perfume.
- 6** Improved ability to detect conditions of ovens, which allows for precautionary steps to be taken
- 7** The new system is able to perform production planning itself, which means increased productivity
- 8** Since all program documentation is handled electronically via backup, all documentation on paper is redundant.



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The customer's viewpoint

Krister Johansson, control system expert at SSAB Tunnplåt during the switchover, had praise for the work performed by ABB:

“The co-operation with ABB was done in a true spirit of win-win. By upgrading from MP 200/1 to AC 450 we were able to use existing hardware and controller software, which reduced risk and cost. A well-done preparation and pre-testing of the system together with openness in communication and willingness from both parties to help each other was significant through the whole project. All issues were dealt with in a professional manner where “they” or “we” never became an issue. Clear and firm rules about the partnership can help, but never replace the one team spirit that follows when people love to work together. All of this made it possible to make the change of systems in about one hour – less than expected – without stopping the process before, during or after installation.”

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