

Rolling with Safe Control and High Precision

The first rolling with the revamped finishing mill at Sandvik Materials Technology took place in the summer of 2004 after the installation of ABB's new control and drive system AC800RMC. This has been specially developed for rolling mill applications.

By MARTIN D. BLAKE, MDB Communications, and WENQING CUI, ABB Automation Technologies AB
Photo: LABE ALLWIN

Since then, the finishing mill with its new control and drive system has been running almost non-stop. 'The new control system gives us new possibilities, including faster production change-overs and better maintenance support,' says Carlgunnar Swärd, senior specialist at Sandvik Materials Technology and project manager for the finishing mill revamp.

New control and drive system

The finishing mill rolls a vast number of steel grades and sizes, which are further processed into rock drill steel. In the end of 2003 Sandvik decided to install a new control and drive system in the mill.

'With a new control and drive system we saw the possibility to increase the old mill's capability to roll more varieties of rock drill steel', says Carlgunnar Swärd. 'A new control and drive system would also improve the precision, speed up the change-over times and make it easier to change pass schedules. In addition, we expected to obtain better information about the process in order to protect the mill against serious faults thanks to faster alarms as well as better basic data for preventive maintenance planning. In the revamp project we focused particularly on improving the maintenance work.'

During the summer vacation in 2004, ABB's engineers started to replace the bar mill's existing analogue control and drive system. This required a great deal of preparations from both sides, the finishing mill's crew and ABB's engineers. The new control and drive system AC800RMC with server was then installed. This included clients based on the Operate IT concept, eight DCS 600 Multidrive and frequency converters. In addition, two operator stations were installed, with one in the bar mill's control room and the other in the production planning office.

Project manager Hans Jegeback, ABB Automation Technologies, Rolling Mills, explains that the new system is based on the AC800M control system and has been further developed for rolling mill applications.

'What we needed above all was a considerably higher speed and certain additional functions. For example, there is a very fast adjustment function for the high-speed shear that cuts



'When we invested in a new control and drive system, we expected to obtain a better information flow for the process,' says Carlgunnar Swärd, senior specialist at Sandvik Materials Technology and project manager for the revamp of the finishing mill.

the rock drill steel after the rolling. We have also developed logging functions that match the mill's speed and logs in the form of analysis displays/diagrams to support the mill operators. Every system, however, should, of course, be adapted to the specific rolling mill that it will control.'

2,000 items during the planning

After the four-week-long installation, the finishing mill was ready to start production again with the new control and drive system.

'The installation and commissioning went very smoothly, and the engineers did an extremely good job,' says Carlgunnar Swärd. 'The revamp was well planned by both of our project teams. We had as many as 2,000 items to go through in our planning sheets. The mill started operation again four weeks and one day after the shutdown.'

A new and complex system is naturally not always that simple to commission smoothly and without any delays.



'It's an advantage to be able to install the new system for the first time on a rolling mill at a well-prepared customer,' says Hans Jegeback, project manager, ABB Automation Technologies, Rolling Mills.

'Operation of the mill, in general, went well, but some fine-tuning was necessary and our operators required some training as well. At the very beginning we did not manage to maintain the same production rate as we did before the revamp. We therefore started to operate the mill with three shifts to be able to keep the delivery times for our customers.'

'The mill is now running very smoothly. We are improving the productivity in a stable way. Further, we are saving material as well. Before the revamp we needed 20 billets every time a new dimension was to be rolled, but now three billets are sufficient. With the new system the finishing mill reaches its full operating speed faster than before the revamp.'

In addition, Carlgunnar Swärd mentions the benefits of the support function provided by AC800RMC for the preventive maintenance of the mill.

'We collect information from a good logging system as well as from different tracking systems, where we can follow the progress of the material all the way through the mill. It's interesting to have a new system. Both ABB and we have already seen quite a few new possibilities during last autumn's operation. It may be a matter of different, small improvements that could give us better and smoother rolling.'

Hans Jegeback agrees with him, saying that the experiences gained at Sandvik will be incorporated in the further development work on AC800RMC.

'It's an advantage to be able to install the new system for the first time on a rolling mill at a well-prepared customer. Sandvik has a number of competent operators. They ran the new system right from the production start-up and they did it in a very professional way.'

Sandvik Materials Technology is a well-known producer of advanced stainless steels, special alloys and value-added products, developed in close co-operation with its customers. The company's five product areas comprise Tube, Strip, Wire, Kanthal resistance materials and Process Systems. Sandvik Materials Technology is a business area within the Sandvik Group and its operations are based in Sandviken, Sweden, as well as in many other locations outside Sweden. The company employs a total of about 8,300 people.

AC800RMC is a control system that has been specially adapted for use with rolling mills. It provides close integration between control system and the operator stations with the help of the 'Drag and Drop' function and is also a powerful tool for the testing and simulation of application programs prior to their implementation. Object-oriented thinking simplifies maintenance. Diagnostics are integrated into the system along with alarm functions, event handling and interlocking. The application programs are structured according to the individual rolling mill's characteristics, which simplify the work of the maintenance staff. ■

This article is based on an article by Marianne Lindeborg.