New expert system for optimizing cement mills: Sicement IT MCO reduces energy costs and assures cement product quality

The Siemens Industry Solutions Division has developed Sicement IT MCO (Mill Control Optimization), an expert system which helps to forecast and then optimize the quality-relevant operating parameters in cement mills. The software has a knowledge-based approach, and uses current plant data to adapt control parameters automatically, so relieving the operator of these tasks. This reduces energy consumption and has a positive effect on availability and profitability. The system has now been installed for the first time in a ball mill belonging to Suedbayerisches Portland-Zementwerk in Rohrdorf, Germany, where it has replaced the previous optimization system. The three other ball mills in the plant will be equipped successively with the new Sicement IT MCO expert system.

The grinding stage in a cement mill is very energy intensive, and consumes almost 45 percent of the total electric power requirement. The Sicement IT MCO expert system offers plant operators the prospect of optimizing cement mill operation, and so reduce energy consumption and assure good product quality. The Siemens software is based on components of the APC (Advanced Process Control) library of Simatic PCS 7, a neural soft sensor, and a model-based, predictive controller (MPC). The neural soft sensor first records different process input quantities, such as the quantity of fresh material and the selected recipe type. The system then uses this data to generate a prediction of the cement fineness, which can be compared with the laboratory analysis of samples from the current production. The final fineness value of the cement and the throughput of returns form the control parameters for the MPC. On the basis of a complete process model, the multiple variable controller calculates external set-point settings for the lower-level individual controllers. To bring the control parameters as near as possible to the desired set-point values, the feed quantity and separator speed are modified to optimize the system behavior.

Sicement IT MCO has been installed for the first time in the Suedbayerisches Portland-Zementwerk in Rohrdorf. It has replaced the former optimization system on one of the four ball mills there, which has a grinding capacity of 60 tons per hour. The automatic, predictive control
system ensures optimum production and quality results, and maintains stable production conditions at all times. The result is a more uniform grinding process. This enables the mill throughput at the desired fineness of grind to be increased, makes the operator's work easier, and reduces energy consumption per ton of cement. As Sicement IT MCO has been totally integrated into the plant and the existing PCS 7 control system, the plant operator does not incur any additional maintenance or servicing costs.

You will find further information about solutions for the cement industry at:

http://www.siemens.com/cement

A photo supplements this press release. Please see:

http://www.industry.siemens.com/data/presse/pics/IIS201101863.jpg

The Siemens Sicement IT MCO expert system has been installed for the first time at one of the four ball mills in the Südbayerisches Portland-Zementwerk in Rohrdorf, Germany. (Source: Südbayerisches Portland-Zementwerk)

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