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Advancements in Genius CM® Chatter: Enhancing Chatter root cause detection and vibration management at BRS PLTCM

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Chatter remains a critical challenge in cold rolling mills, as different vibration types can lead to severe strip defects or mechanical failures. This paper demonstrates the advancements in the Genius CM® system, based on its application at the Big River Steel (BRS) Pickling Line Tandem Cold Mill (PLTCM), in the context of enhanced Chatter root cause detection and vibration management.

Genius CM® is a condition monitoring system designed to solve vibration issues like those that occurred at BRS PLTCM after several years of operation. The system was implemented in stages, beginning with comprehensive data collection and the implementation of an Automatic Slow Down feature to manage acute vibration events. Based on the ongoing cooperation between SMS and BRS and based on the analysis results, new advanced functionalities were developed.

A first new functionality provides the option to control the attachment of the backup roll pusher cylinders, based on vibration conditions, directly from the Genius CM® system. Further advancements include the automatic detection of Chatter root causes. Enhanced reports and new views help to identify mechanical issues causing Chatter. At BRS PLTCM, backup roll bearing damages were clearly identified and the results were verified by inspections. Consequently, targeted maintenance actions were executed. These new capabilities make the Genius CM® system an indispensable tool for mill operation in the context of proactive vibration management to maintain optimal mill performance. As an outlook, the paper discusses the option and potential for implementing vibration-based speed recommendations in order to avoid Chatter issues and optimize the mill's productivity.

In summary, the deployment and continuous development of the Genius CM® system at BRS PLTCM highlight its important role in handling complex vibration challenges. These advancements will not only improve current operations but will also be the basis for future innovations and (process) optimizations.

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