

Insights and Observation for Optimum Work Roll Cooling in Flat Hot Mills: A Case Study on Shape Defect Elimination

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Abstract : Tata Steel Bhushan Steel Ltd.(TSBSSL)'s Hot Mill at Angul , Orissa , India, was facing shape issues in Hot Rolled (HR) coils. This was resulting in a defect called as 'Ridge', which was appearing in subsequent cold rolling operations at various cold mills (CRM) and external customers. A collaborative project was undertaken to resolve this issue. One of the reasons identified was the strange drop in thermal crown after rolling of 20-25 coils in the finishing mill (FM) schedule. On the shop floor, it was observed that work roll temperatures in the FM after rolling were very high and non uniform across the work roll barrel. Jammed work roll cooling nozzles, insufficient roll bite lubrication and inadequate roll cooling water quality were found to be the main reasons. Regular checking was initiated to check roll cooling nozzles health, and quick replacement done if found jammed was implemented. Improvements on roll lubrication, especially flow rates, was done. Usage of anti-peeling headers and inter stand descaling was enhanced. A subsequent project was also taken up for improving the quality of roll cooling water. Encouraging results were obtained from the project with a reduction in rejection due to ridge at CRM's by almost 95% of the pre project start levels. Poor profile occurrence of HR coils at HSM was also reduced from a high of 32% in May'19 to <1% since Apr'20.

Keywords : hot rolling flat, shape, ridge, work roll, roll cooling nozzle, lubrication

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