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Optimisation of roll cooling and descaling processes at Erdemir HSM#2

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The Hot Strip Mill # 2 of Erdemir started operation in 1978. Since the startup, two major revamps were conducted in 1995 and 2007.

Potential for further optimizations was expected in the roll cooling header design comprising a wide range of different nozzle types including very small nozzles, which are prone to clogging. As a result, the strip thickness across the width was affected and the roll surface quality was poor. The efficiency of the roll cooling system had to be checked after HSS type rolls were in operation. Moreover, a study how to improve the descaling efficiency was also included.

Lechler investigated both, the roll cooling and descaling systems aiming for an optimization of the existing processes utilizing the available resources and avoiding major modifications of the existing systems. Based on detailed technical proposals modifications were made to both systems.

A thermal roll cooling study has was carried out evaluating the potential for increased efficiency utilizing the existing cooling water capacities. A revised roll cooling nozzle layout redistributing the cooling water would reduce the work roll surface temperatures, minimize defects, and extend the lifetime of the work rolls.

Simulations on the existing descaling operations were conducted benchmarking the existing descaling performance. Based on these result revised descaling nozzle layouts have been proposed in order to increase the efficiency utilizing existing pump capacities. A significantly improved descaling performance in combination with reduced energy costs for descaling operations were achieved.

As a result of these optimizations the productivity of the hot strip mill was increased by reducing roll cooling problems (roll wear and surface quality problems, preventing nozzle clogging), cost savings have been achieved by decreasing water flow in descale headers. The product quality was increased by decreasing the scale and roll surface quality problems.

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