

Press Information

METALLOCK IN-SITU MACHINING OVERCOMES WEAR AND EROSION PROBLEMS FOR CORUS

To restore the reversing roughing mill to its original manufacturing tolerances for squareness, straightness and dimensional accuracy and further improve the quality of rolled product produced on the hot strip mill at Corus, Port Talbot, Metallock Engineering, in conjunction with Universal Engineering Design Ltd (UED), carried out extensive in-situ machining work during a recent shutdown. Coventry based Metallock has a wealth of experience in this type of work and has developed equipment and expertise enabling it successfully to undertake such projects within customer time and budget allowances.

Over recent years the mill housings had worn and suffered corrosion necessitating shims and oversize wear plates. The 80-inch reversing roughing mill, complete with edge rolls, is the first stage of the hot strip production line with the steel being passed through the rolls up to seven times. Due to the wear problem caused by descaling ingress it was becoming difficult to present the desired quality of strip to the coil box and subsequently the finishing mill.

Work had been carried out in the top work roll area in 1995 using shims and oversize wear plates to eliminate damage there. During a later inspection of the bottom work roll and bottom back-up roll areas at it was determined that damage and erosion had reached an unacceptable 4.00mm. Corus management and Sheffield-based UED, their project managers, decided that remedial work would necessitate removing 6mm from the housing faces in the damaged areas and the fitting of new wear plates. Metallock Engineering was selected jointly by Corus and UED to undertake the in-situ machining work based on successful similar operations at Corus Llanwern previously.

However, following an inspection after the strip-down to carry out the work, it was discovered that the top work roll area had sustained damage since the original survey. Corus sought to have this re-machined as well as part of the work programme. Checks were made to establish that the rig and set-up to be used by Metallock to machine the bottom roll areas would be capable of extending to the top work roll area as well.

A few modifications were required and in the words of UED's project manager Howard Duke, "Metallock provided an excellent service and completed 25% more machining than envisaged within the programme".

Metallock's special purpose milling machines, designed and built themselves are designed to attach to the housing using existing bolt holes and the roll change rails and, depending upon the areas to be machined can be selected to reach the full height of the housing. To speed the machining process both incoming and outgoing housing faces are machined simultaneously using hydraulically driven milling heads equipped with 160mm diameter cutters. The operator side housing is done first and then the milling machine vertical column is traversed through to the drive side housing to continue the machining operation.

In addition to the face machining, Metallock also restored M30 bolt holes in the housings used to secure the wear plates as during an examination it was found that 60/70% of them were a sloppy fit. Again, to speed the operation, drilling and tapping of the drive side housing was being carried out whilst the operator side was being milled. Once completed, drilling and milling rigs were changed over to drill/tap the operator side and mill the drive side.

Due to the design and the manner in which the milling machine is set up optically, Metallock engineers are able to achieve tight tolerances based on a central datum. In the case of the Port Talbot mill, the housing was within 0.002-inch (0.0508mm) which was possibly an improvement on the original set-up when the mill was new.

By extending its specially designed milling and drilling column for mill housings, Metallock was able to machine the top work roll area as well as the bottom roll faces. The rig is attached using existing bolt holes and the roll change rails.



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