

METALLOCK OVERCOMES CORUS BOS VESSEL DRIVE BACKLASH PROBLEM

Having a 1500 tonne BOS vessel that is rocking more than it should do when being tilted can cause problems, but how do you overcome it? Such was the situation at Corus, Scunthorpe with the No 1 vessel when it was discovered that the four keyways on the trunnion diameter linking to the drive bull wheel were badly worn.

The BOS vessel is supported on both sides with roller bearings but only driven for tilting from one side through a bull wheel connected via pinions to two drive units. Although there is always a certain amount of backlash in the system, if the keyways become worn this backlash becomes excessive. Corus was concerned that continued use in the worn state could cause cracks to propagate from the keyway corners. With a view to solving the problem Metallock Engineering was called in for discussion. Due to the way the machinery is set up, the keyways/keys can be only be inspected by dismantling the complete assembly.

It was decided that things would be left as they were until the next change of bearings was scheduled during a plant shutdown. At this time, when everything was dismantled, a team of Metallock engineers moved in to machine the keyways to clean up. Using their own specially designed tooling, Metallock proceeded to machine 1mm from each face and the bottom from each of the four keyways equi-spaced on the 1054mm trunnion diameter. The keyways were 215mm wide, 686mm long and 81mm deep.

The tooling comprised an inner ring and spacer legs loaded to the shaft at the vessel end. A front plate located on the shaft diameter and was bolted to the shaft and spacer legs. The front plate is set with cut-outs parallel to the existing keyway bottoms. Moving the front plate also sets the inner ring at the inboard end. A milling machine is loaded on to the front ring and inner ring in each of the four positions to machine the keyways. The three-axis milling machine ensures that the keyways are cut to size and are concentric to the shaft and original keyways. The in-situ machining was very accurate and better than machining the hub in a workshop.

Whilst the Metallock engineers worked around the clock over a four day schedule, 4 mating keyways on the 24 tonne bull wheel hub were being machined by others to match those on the shaft, thereby avoiding a need for stepped keys.

A spokesman for Corus said that Metallock did an excellent job with everything going smoothly. The alternatives to re-cutting the keyways in-situ would have been to fit a new shaft or reclaim by welding, both of which would taken much longer than the time spent by Metallock. On completion of all the work the support and drive system was reassembled and recommissioned.



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Metallock Engineering UK

Unit H 5
Pilgrims Walk
Prologis Park
Coventry
CV6 4QG
England
Phone: +44 (0) 24 7636 0084
Fax: +44 (0) 24 7636 0190
E-mail: sales@metallock.co.uk
www.metallock.co.uk

