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Schaeffler Global Technology Solutions

Steel and non-ferrous metals

Tata Steel Group, Great Britain

Replacement of Main Trunnion Bearings on BOS Plant Vessels

The Tata Steel Group has operations in 26 countries and produces 28 million tonnes of steel per year. Port Talbot Works is part of the Strip Products UK business, producing hot rolled, cold rolled and hot dip coated steel.

Challenge for Schaeffler

Tata Steel Port Talbot has two BOS steelmaking vessels (V1 & V2) in operation. The main trunnion bearings on a BOS (Basic Oxygen Steelmaking) plant at Tata Steel Port Talbot had to be replaced due to a sudden bearing failure on the non-drive side (NDS) of the V2 BOS plant vessel. Loss of operation of a BOS vessel would result in significant lost revenue for Tata Steel.

Schaeffler Solution

A method statement was drawn up by Schaeffler UK, which specified the sequence and method to replace the bearings and outlined the Tata requirements. Included in this document was a detailed tooling list and a step-by-step procedure for the dismounting and mounting of the drive-side (DS) & non drive-side (NDS) bearings.
The standard 'solid' bearing on the DS was replaced by a special FAG split spherical roller bearing, which is the recommended replacement spare, as this reduces the amount of downtime when installing the replacement bearing. The NDS bearing was to be replaced with a similar solid bearing. In addition, various surrounding components also required replacing, once the secondary damage caused by the bearing failure had been identified.

Technical Information about the Vessels
Original vessel installation:
In the late 1960s
Vessels upgrade:
In 1991/1992
Steel making capacity:
330 tonnes (each vessel)

LuK INA FAG

Fitting of non-drive spherical roller bearing

Supporting structure for vessel

Fitting of FAG split spherical roller bearing

Customer Benefit

After having successfully completed the work in only 10 days, Schaeffler engineers were pleased to be leaving behind a very happy customer.
The bearings were fitted to a high standard with expertise provided by Schaeffler throughout the installation process. A further advantage of using split bearings as opposed to solid bearings was that there was no need to disassemble the bull gear unit (i.e. the main drive unit for the BOS plant vessel). During the bearing changeover, several unexpected problems were encountered and were discussed with Tata BOS Plant engineers, Schaeffler engineers from UK and Germany, and Tata Central Engineering Support. Between all parties, solutions were generated, action plans compiled and remedies implemented. Without Schaeffler's expertise, the bearing change would not have run so smoothly.

Bearing type	Downtime	Cost
Unsplit bearing:	7 days	€ 4,0 M
FAG split spherical roller bearing:	3 days	€ 1,7 M
Savings:*	**4 days**	**€ 2,3 M**

*These savings are dependent upon throughput and steel grade mix.

Speed was a major key to customer satisfaction in this project. If the vessels had been at a standstill for a much longer period, this would have resulted in a significant loss of revenue. Against this background the higher purchasing price of the split spherical roller bearings was of little significance.

What's special

After the bearings were installed, the work didn't finish there. Schaeffler UK prepared a recommended practical maintenance schedule and forwarded this to the BOS engineers, which was well received.
Since replacing the trunnion bearings, engineers from Schaeffler UK have also supervised two further BOS vessel bearing changes in a very short time frame of just two months.

Technical Information about the Solution
Drive-side bearing:
• Type: FAG split spherical roller bearing (Z-568168.PRL) • Dimensions: 1180 x 1750 x 375/550
Non drive-side bearing:
• Type: Spherical roller bearing (230/1250-B-K-MB-C4) • Dimensions: 1250 x 1750 x 375

GTS 0080/ 01 / GB-D / 201404