

Schaeffler Global Technology Solutions

Raw material extraction and processing

Sunstate Cement Ltd., Australia

Short-Term Monitoring Solution for a Tube Mill

Sunstate Cement Ltd. is one of Australia's leading manufacturers and suppliers of high quality cement products to commercial businesses throughout Queensland and Northern New South Wales.

With a capacity to produce over 1.5 million tonnes of cement per year, Sunstate Cement Ltd. has a long history as a major contributor to Queensland's largest and most impressive infrastructure projects for over 25 years.

Challenge for Schaeffler

Sunstate Cement Ltd. had performed visual inspection of the Tube Mill No1 trunnion drive end bearing. During this inspection they found the bearing was in a reasonable condition after 28 years of service and decided to extend the service life by rotating the outer ring by 180°, what is a common practice for this type of application. After this rotation, Schaeffler technicians were asked to provide condition monitoring of the bearing, in order to provide Sunstate Cement Ltd. assurance the bearing was fit for purpose.

Schaeffler Solution

Due to the unpredictable operating times and despite the slow speed of the mill, the customer was considering to collect vibration data. Schaeffler recommended a temporary solution, consisting of two FAG SmartCheck online systems (one axial, one radial) and a remote wireless network system for communication, monitoring and diagnostics from the Schaeffler Online Centre in Sydney Australia. The FAG SmartCheck units were configured to suit slow speed bearings and set up to only collect data when the mill was operating ensuring only relevant data was retained. This temporary solution proposed by Schaeffler was accepted by the customer for a period of one month. After this period a machine condition report was provided by Schaeffler technicians outlining the trunnion bearing was fit for service.



Technical Information about the Plant

Number of Cement mills:

3 tube mills

Production capacity of each mill:

60 – 100 t/h

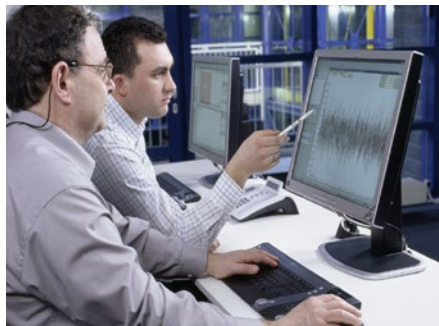
Most produced types of cement:

- Flyash Blend
- GP Cement





Two FAG SmartCheck units monitored temporarily the condition of the trunnion drive end bearing



Data analysis done by Schaeffler condition monitoring experts



Meanwhile the FAG ProCheck monitors all critical assets of the tube mill

Customer Benefit

By implementing the temporary FAG SmartCheck monitoring solution, Schaeffler was able to supply promptly a cost effective monitoring system to assess the condition of the trunnion drive end bearing for continued service. The FAG SmartCheck provided high quality vibration data at slow speeds. Subsequently Schaeffler condition monitoring technicians analysed the data and made recommendations to the customer for continuation of service for the trunnion bearing. The benefit and value to Sunstate Cement Ltd. was obtaining assurance that the bearing was suited for further operation whereby a considerably more cost-intensive exchange could be avoided.

Cost of a new trunnion drive end bearing:	€ 105 000
Average downtime cost per hour:	€ 1 500 – 3 500
Average downtime for a bearing replacement:	3 – 5 days (min. 72 hrs.)
Cost savings for every avoided bearing replacement:	> € 200 000

In the same plant, two of the three mills were already equipped with FAG ProCheck and remote monitoring service. Meanwhile the customer has also equipped its third mill with a permanent FAG ProCheck monitoring system to effectively continue monitoring the remaining life of its bearing with Schaeffler online monitoring services. FAG ProCheck is used in general to monitor the vibration behaviour and other process parameters. In this application it allows in particular the vibration monitoring of the slowly turning trunnion drive end bearing.

What's special

Before the final use of FAG ProCheck it was possible to provide a short-term cost-efficient monitoring solution with FAG SmartCheck. The project shows how Schaeffler adds value to the customer by combining flexible solutions and initiatives with the right products and service team that takes time to understand the uniqueness of your plant and and your needs.

Technical Information about the Solution

Monitored bearing:

Trunnion drive end bearing (249/1500CA)

Monitoring systems applied:

- First: 2 FAG SmartCheck systems
- Later: FAG ProCheck

FAG SmartCheck signal transmission:

- 2 high resolution piezo sensors
- Remote wireless network system

Operating parameters monitored:

- Bearing temperature
- Bearing vibration
- Fixed Speed
- Bearing components

Diagnostic methods:

- Time signal
- Envelope curve
- Speed and frequency monitoring
- Spectrum and trend analysis