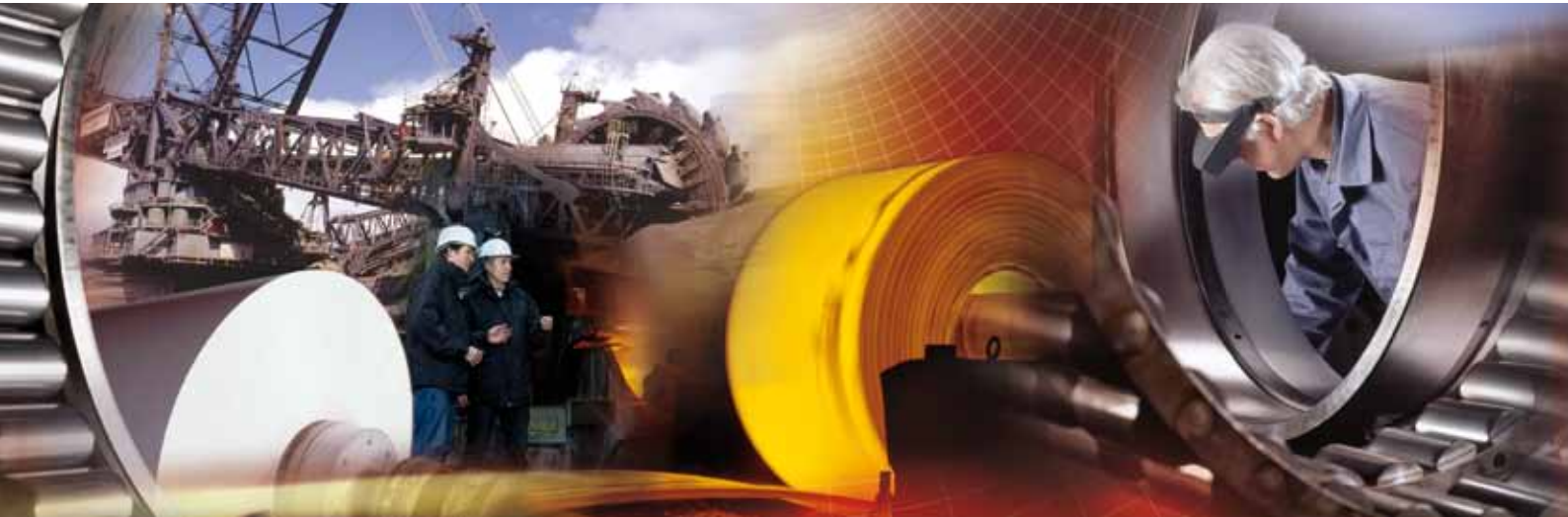


# Smart Performance Program



## Avoiding 72 Hours Fan Downtime by Condition Monitoring



**Industry:** Raw material extraction and processing


**Customer:** Hindustan Zinc Limited, Debari Site, Udaipur (India)

Hindustan Zinc Limited (HZL) belongs to the Vedanta Group and is India's only integrated producer of zinc and lead. With a metal production capacity of currently 754,000 tons per annum the company is among the world leaders. The smelters are situated at Chanderiya, Debari and Visakhapatnam and the mines at Zawar, Dariba and Rampura Agucha. HZL has about 6,400 employees.

### Challenge for Schaeffler

Schaeffler holds a service contract with the Hindustan Zinc Limited plant in Udaipur since two years. In the last year, Schaeffler Field Service Engineers (FSE) were able to avoid 50 hours of unplanned plant shutdown due to advanced condition monitoring services. This success is still continuing by the weekly control of all critical and a monthly control of all non-critical machines using FAG Detector III. Especially in the case of non-redundant equipment the expert know how of Schaeffler is essential to avoid unplanned expensive downtimes.



**Technical Information about the Plant**

**Production capacity:**  
888,000 metric tons (MT)/year

**Process type:**  
Hydrometallurgical process for zinc production

## Schaeffler Solution

During the vibration measurements the Schaeffler FSE detected high frequency vibrations of the roaster air blower. Closer analysis revealed that these high vibrations were caused by a bearing inner ring damage. Based on this diagnosis HZL planned to replace the fan drive end side (DE) bearing. The complete dismounting and assembly was done in four hours by operating the plant in circulation mode, without shut-down.

## Customer Benefit

As the fan is a single equipment, an unplanned fan failure can cause a shutdown of the complete roaster for at least 72 hours (three days). By the early detection the customer was able to plan the necessary repair work betimes and avoid considerable losses as well as damage-expansion to peripheral equipment .

Capacity of roaster furnace:	33 MT/h
Concentration of zinc in output of roaster:	60%
Recovery rate of zinc:	96%
Zinc price:	INR 21,000/MT
Benefit calculation:	$33 \text{ MT/h} \times 72 \text{ h} \times 0.60 \times 0.96 \times \text{INR } 21,000/\text{MT of zinc}$

**Total savings: = 28,740,000 TNR (approx. € 450,000)**

Further benefit resulted from the continuous plant operation. As the zinc production is an exothermic process, such a stoppage had also caused an interruption of the steam generation process.

## What's special

Due to the close cooperation between HZL and the Schaeffler Group the FSE know HZL's plant, processes and critical applications very well. Thus, the FSE can always take special attention to HZL's critical single line equipment. This way they were also able to detect the high vibrations on the roaster air blower in good time and avoid an expensive shutdown.

### Technical Information about the Solution

#### Monitoring system:

- FAG Detector III

#### Monitored components:

- Electrical motors
- Gearbox bearings input shafts
- Gearbox bearings output shafts

#### Technical details of the monitored components:

- Motor speed: 1480 RPM
- Gearbox bearing output speed: 56 RPM
- Motor power: 10 HP

#### Monitoring functions:

- Characteristic value and FFT
- Vibration velocity
- Vibration acceleration
- Demodulation

#### Monitoring frequency:

- Weekly rather monthly



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