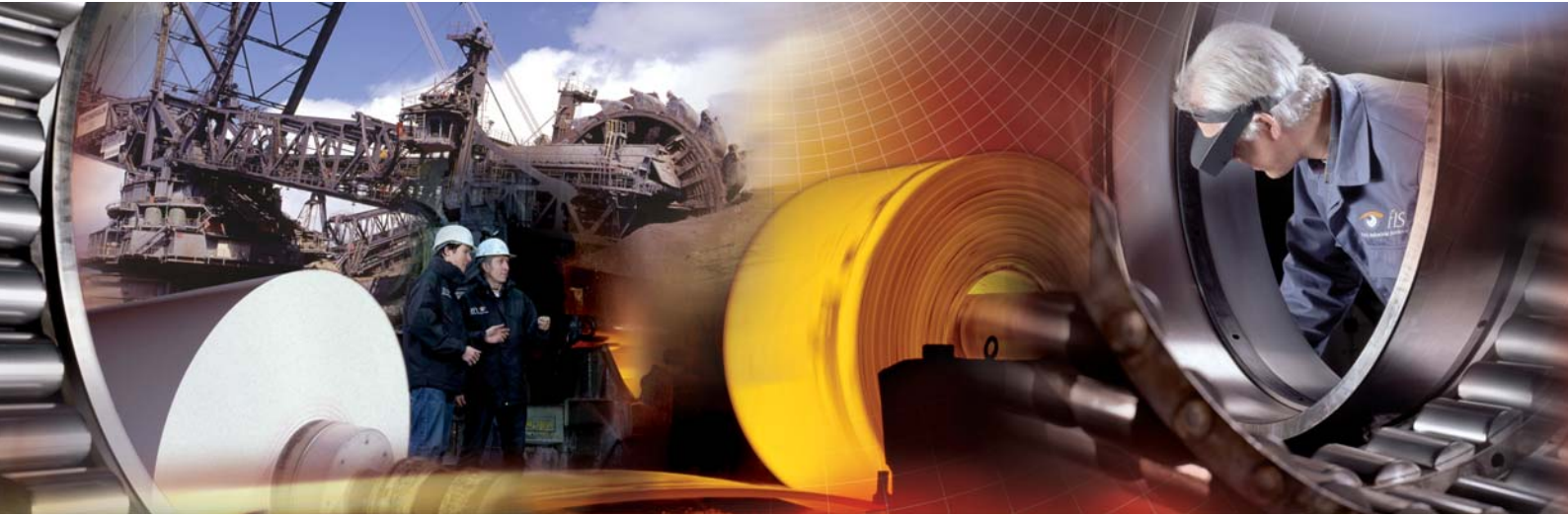


# Smart Performance Program



## Online Vibration Monitoring on Tube Mills in the Cement Industry

**Industry:** Raw material extraction and processing

**Customer:** Spenner Zement, Erwitte (Germany)

Spenner Zement offers its customers a wide range of products and services in the fields of cement, lime and dry mortar. In addition, Spenner Zement develops disposal concepts for many industry sectors whose waste products can be used for secondary raw materials and as fuel.

### Challenge for Schaeffler

The customer has several cement mills (tube mills) at its location in Erwitte, Germany, and runs its production at full capacity despite the difficult market conditions in the sector. Despite monitoring with a temperature sensor, in 2002 one of the mills had to be shut down for three weeks because of a gearbox damage. The gearbox showed already heavy deterioration and had to undergo cost-intensive reparings.



### Technical Information about the Plant

**Production facility:**

Tube mill (tube grinding)

**Driving power:**

1 MW (triple shaft helical gearbox)

**Length:** 8 m

**Diametre:** 3 m

**Speed:** 15 RPM

## Schaeffler Solution

F'IS installed the online monitoring system FAG DTECT X1 with five sensors at the main gearbox and reduction gear. Whilst F'IS experts supported the customer for three months in analysing the data, Spenner employees were trained in vibration monitoring and they started to operate the system on their own. In 2004, the FAG DTECT X1 detected a tooth damage in the gear mesh which was confirmed after a visual inspection by Spenner Zement. The gearbox was replaced during a planned shutdown. At the same time, abrasion on the tothing of the layshaft gear pinion was identified and removed.

## Customer Benefit

Thanks to an early detection of the damage with the FAG DTECT X1, an unscheduled shutdown, and thus a major loss of production, could be prevented. Considerable repair costs could be saved through preventing secondary damage on the gearbox. This means in figures:

### **Before installing the Online Condition Monitoring System:**

Repair costs in case of major gearbox damage	€ 50,000 – 100,000
Production loss	approx. € 6,000/h
Total cost	> € 50,000

### **With Online Monitoring System FAG DTECT X1:**

Project costs for monitoring system incl. service	€ 18,000
Actual repair costs with early detection of damage	€ 5,000
Total cost	€ 23,000

Savings

> € 27,000

## What's special

Particularly challenging from a vibration diagnostic point of view is the monitoring of gear meshing on a slowly rotating assembly. The success of the project convinced Spenner Zement to expand their monitoring system. What is more, the customer reported the monitoring success to the professional journal "Automation & Drive" (edition April 2006). This solution can be transferred to nearly all tube mills used in raw material extraction and processing as well as coal pulverizers in fossil power plants worldwide.

## Technical Information about the Solution

### Monitoring system:

8-channel FAG DTECT X1

### Sensor system:

ICP acceleration sensor (5 pcs.)

### Housing:

IP66

### Communication:

Com-Server (TCP/IP)

### Additional signals:

Speed and load (motor current)

### Monitored machine elements:

3 sensors at the gearbox:  
Monitoring of the gear bearings and gear mesh

2 sensors at the reduction gear:  
Monitoring of gear rim and pinion



Contact details for worldwide contact persons as well as further

**Smart Performance Solutions** can be found on our homepage

[www.smartperformanceprogram.com](http://www.smartperformanceprogram.com)