

An example of a ball machine

Improved Mill at Metalloys

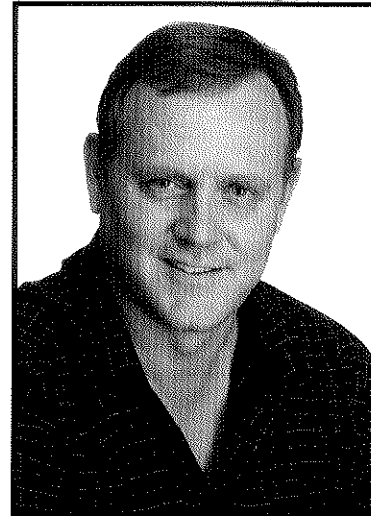
The main ball mill production machine at BHP Billiton's Metalloys has been transformed into a reliable machine - thanks to a new vibration monitoring system installed by leading specialist in machine condition monitoring, Engineering Dynamics. Ball mill MM7 on the site in Meyerton, Gauteng, is operated by DMS Powders - a market-leader in the production and distribution of dense media ferrosilicon powders. The project manager (PM) notes that the company uses the mill to grind ferrosilicon alloy into a fine powder; and that the highly-abrasive nature of the product created by DMS Powders, coupled with constant pressure on the mill's bearings and rotating parts, resulted in numerous breakdowns of the equipment. "Owing to the fact that the mill operates on advanced German technology; technical support in South Africa was lacking. In the event of any mechanical failure, we would be faced with a waiting time for new parts of up to nine months - resulting in prolonged downtime periods and excessive financial costs," he explains. The PM points out that after unsuccessfully attempting to source new gearboxes locally, DMS

Powders realised that it needed to take a proactive approach, and monitor bearings and important rotating parts in the mill. He says: "Due to the amount of regular wear-and-tear on the parts of the mill, we needed to take pre-emptive action and be able to establish the exact time that a part was going to break down."

After inviting companies to tender for the position, the PM notes that DMS Powders was most impressed with Engineering Dynamics - who gave the company a live demonstration, as well as a testing run of the product. "Technical and after-sales support is very important to

us. Engineering Dynamics displayed a broad knowledge of the product, and ensured that we had easy access to any parts," says the PM. Engineering Dynamics managing director Christo van der Walt points out that a system consisting of vibration sensors on the motor, gearbox, pinion bearings and auxiliary equipment, was installed at the mill over a period of five working days. He says: "Mills can be a bottleneck area for many processing plants - if it shuts down, it has a knock-on effect on the entire operation. Due to their sheer size, it is important to keep mills running at optimal efficiency by ensuring that they are constantly monitored. There are also health and safety issues to be considered when trying to take measurements so close to the rotating parts of the mill" Van der Walt

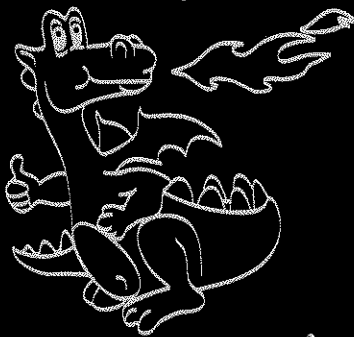
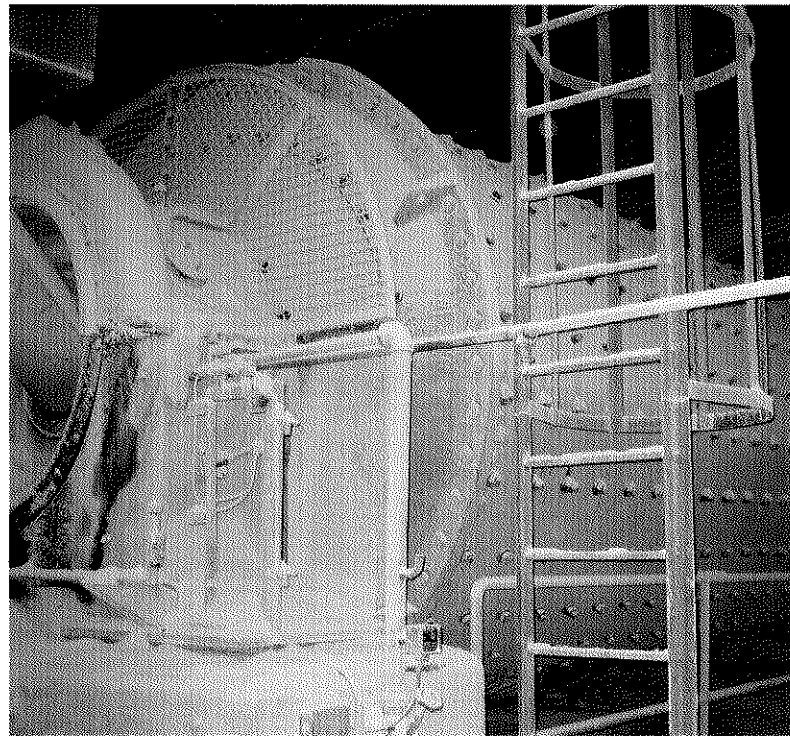
explains that signals from the monitors are passed through the Allen Bradley XM161 vibration monitors in a panel in the Motor Control Centre (MCC). 4-20mA Outputs from the panel then goes directly into their PLC system. "Live vibration data and trends from the PLC are displayed in a SCADA system in the Control Room.



Christo van der Walt

Provision is made, through a switch box, for a vibration analyst to access the raw data for scheduled or call-out situations from the safety and comfort of the clean and cool MCC," he continues. The PM believes that since the system was installed three years ago, it has already paid for itself. "By detecting any faults or damage as early as possible, we have been able to schedule downtime to carry out inspections and minor repairs in the shortest time possible. As a result, we have been able to save a girth gear – which can cost up to a million rand – on two separate occasions," he says. Although the process has been relatively-problem free, van der Walt notes that the biggest challenge in installing the system came from high-frequency sounds created in the ducting of the mill's fans. "The ducting has 90° bends, which result in the air flow becoming unstable, and creating a high-frequency noise above the audible range," van der Walt explains. "The electronics in the transducers; however, are very sensitive to this noise. Initially, we could not understand why the readings were inaccurate. Luckily we have resources overseas, and were provided with another type of transducer. There have been no problems since." The PM notes that an additional challenge was to change the mindset of staff on a mechanical maintenance level - who were initially reluctant to having a new system introduced to the mill. "After staff members from Engineering Dynamics arrived on-site to provide necessary training, the system was widely accepted as being easy to learn and to operate. We are happy with the excellent support

and service that we have received from Engineering Dynamics, and I would not hesitate to approach them for assistance in a future project," the PM concludes.



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