



Integrated solutions from Circular Economy Centre

The SKF Circular Economy Centre is securing new customers on the strength of its ability to combine deliverables that optimise operations and cost savings with environmental benefits.

Aligning with SKF's circular economy drive, the organisation continues to innovate its products, systems, and services. One of SKF's greatest strengths is the development of new technologies and value-adding solutions to assist customers in achieving their economic and environmental sustainability goals.

"This proud reputation prompted the customer, who is a leading operator in the mining sector based in Gauteng, to approach us in August 2022 for a bearing remanufacturing solution," says Lourens Pretorius, SKF Circular Economy Centre Manager. "The customer later called for a further eighteen additional gearbox bearings to be sent to SKF's Reman Centre for assessment."

What initially started with a request for a site inspection of SRBs (spherical roller bearings) – while still running on their respective shafts – to determine if they were suitable for remanufacturing, was followed by a fully integrated solution from the SKF Circular Economy Centre. This included the supply of new and refurbished bearings, mounting tools, and local engineering components as well as additional support services such as

professional bearing fitment and a condition monitoring solution that called on the expertise of SKF's Mechanical Field Service and Connected Technologies team.

"We remanufactured a total of 25 bearings and replaced three bearings that did not pass our remanufacture assessment requirements," explains Pretorius. "We also supplied eleven new units as well as local engineering components, including new bearing sleeves and lock nuts."

Pretorius weighs in on the value that SKF's specialist Remanufacturing Centre adds. "In the true sense of what makes up a circular economy, our remanufacturing capabilities enable us to reduce, reuse and recycle. Instead of being replaced, remanufactured bearings are given a new lease of life and are reused. As remanufactured bearings are much more cost-effective than new bearings, we can keep costs down significantly for our customers."

"Moreover, the waiting period for certain large size bearings can be up to several months but as we are able to remanufacture bearings within three to five working days we substantially reduce the lead times, getting our customers fully operational within a few days."

Pretorius adds that SKF's remanufactured bearings and units conform to the same geo-

metric, form and quality specifications as new SKF products. Remanufactured components carry a one-year conformance warranty, which is testament to the high quality and reliability of these products.

Finally, Pretorius points to the fact that bearing remanufacture reduces material consumption; while bearings not eligible for remanufacture can be recycled to produce new bearings, effectively closing the reduce/reuse/recycle loop.

SKF's Mechanical Field Service team stepped in to ensure that the bearings were correctly fitted by using a selection of MaPro mounting tools including a bearing heater, hydraulic nuts and spanners; and a C-Spanner was purchased by the customer.

In addition to providing a baseline vibration monitoring required by the customer to ensure that the equipment passes all the necessary requirements before commissioning, SKF's Connected Technologies team was also able to provide baseline readings on other critical equipment.

The complete SKF solution includes condition monitoring; vibration and temperature data is collected in real-time and is analysed to identify potential issues on the bearings. Alongside extending bearing life and increasing mean time between failures (MTBF), condition monitoring and data analytics can also identify potential bearing failures, enabling the unit to be removed timeously for repairs or replacement and thus reducing the risk of costly production stoppages.

Pretorius sums up the sustainability benefits of SKF's turnkey solutions: "Benefits for our customers include increased service life, machine and equipment reliability and longer lifecycles, as well as operator safety and all the related cost savings. These factors are fundamental to ensuring sustainable operations. Furthermore, reduced material consumption, direct energy consumption and emissions because of our reman process also reduce impact on the environment."

Pretorius confirms that the work for the new customer is ongoing. "We have identified more areas where we can add further value for this customer and are bringing our other departments on board to lend their professional expertise."

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Online condition monitoring improves diamond plant efficiency

A leading global diamond producer has raised plant efficiency by installing SKF automated machine health monitoring and surveillance systems, along with the @ptitude Observer (@O) software.

A diamond producer in Botswana was looking for an online condition monitoring system to align with its digital transformation strategy in a cost-effective way. In addition, the customer required support for its reliability strategy in a bid to reduce unplanned downtime at its mining operations.

Owing to its proven world-class online condition monitoring systems and outstanding service solutions, SKF was selected to be a long-term partner on the customer's journey to full digitalisation at the client's four mining sites.

Kutsi Jaka, SKF Product Manager: Condition Monitoring (CoMo), explains that the mining company was already familiar with SKF having been an indirect customer for several years. "SKF South Africa has been supplying products and services including bearings, seals, MaPro, power transmission, training, as well as several other related services to the customer via distributors in Botswana. The customer has also been using the SKF Microlog hand-held vibration analysers and @ptitude Analyst software."

Before building a proposal, the SKF team held several online meetings with the customer, building up to a scoping visit at the mine site, to understand and define the necessary requirements. SKF South Africa recommended the Enlight IMx-1 automated machine health monitoring system and Multilog IMx-8/16 surveillance systems complete with the @ptitude Observer (@O) software to monitor the customer's critical and semi-critical assets.

Satisfied with SKF's proposal, the customer gave the green light to implement the online condition monitoring project to monitor all its critical assets at the mine site. The critical assets monitored in real-time by the wired SKF IMx data acquisition devices include High Pressure Grinding Rolls (HPGRs), Gyratory Crushers and Conveyor Drives, whilst the semi-critical equipment is looked after by the wireless SKF Enlight Collect IMx-1.

The SKF Enlight Collect IMx-1 system, comprising vibration and temperature sensors and gateways, collects critical data on the health of machines and equipment. Both the Multilog IMx-8/16 surveillance and Enlight Collect IMx-1 systems provide data to the

customer's historian (data store) for machine learning algorithms and analytics.

The historian uses the SKF @ptitude Observer suite (@O) data through the Phoenix API (Application Programming Interface) enabling the customer to access condition monitoring data onsite, saving significantly on possible PLC I/O card costs they would have had to invest in. The data is analysed by specialists based at the SKF Africa RDC in Johannesburg, and an overview and detailed asset health report is created periodically for the customer.

The data store collects history data such as temperature, pressure, current, voltage, and any other type of operational data, from the SKF IMx range data acquisition devices. Each of these data sets or signals also has a time stamp assigned to it in order for the historian to simplify the most demanding data reporting and analysis requirements.

Primarily developed to work with on-line condition monitoring systems, @O is a core platform in a family of reliability software applications that work together as the SKF @ptitude Monitoring Suite.

The software offers an easy-to-use operator interface and intelligent diagnostics



SKF's Enlight Collect IMx-1 is a scalable and easy to set up mesh sensor network for data collection from condition-based monitoring sensors.

functions. "The expert diagnostics and analyses functionality resident in @O provide unrivalled application insights to maximise rotating equipment performance (REP)," states Jaka. "This optimises safety, reliability and sustainability and allows the customer's business to be more agile and deliver greater output."

By providing real time data on the condition of the customer's assets and general plant health, SKF's holistic online condition monitoring solutions contribute to optimised equipment performance, efficiency, reliability, and reduced life cycle costs. The subsequent optimised plant and machine availability enhances uptime and production at mine sites, for ultimate customer peace of mind.

According to Jaka, based on the success of this project, SKF will be rolling out further online condition monitoring systems to the customer's other three mines in due course. □



SKF Enlight IMx-16 automated machine health monitoring systems provide for early fault detection and improved reliability, availability, and performance of rotating equipment.