How sealed bearings make sense in mining

The mining industry is under continuous pressure to boost operational efficiency. Delaying the introduction of modernization risks not reaching business targets for throughput due to breakdown or plant availability below competition.

"Conveyors are the most problematic asset in mining and pulley bearings are often the root cause. The harsh and punishing conditions of mining put bearing technology to a real test," says Daniel Agnemar, Senior Business Developer, Mining at SKF.

In a survey presented at the SKF Life Cycle Management Conference 2018 in the US, 44% of mining operators ranked conveyors as the most problematic asset in terms of reliability followed by 17% for mobile equipment and 11% for grinding mills.

An in-depth analysis of two years' online monitoring of a conveyor system at an iron ore mine in Sweden revealed that bearing damage in both the end pulley and drive pulley is the chief cause of conveyor breakdowns.

Still few technology measures have been deployed to ensure that pulley bearings, and conveyors, last longer. In fact, many mine operators expect bearing failure and use frequent and excessive maintenance to deal with the problem.

Upgrade bearing technology

Mining conveyors traditionally use standard open bearings because they are less expensive. An audit including visual inspection of 11 conveyors at a major iron ore mine in Australia including 39 pulleys with 78 bearing housings in total revealed that contamination and improper lubrication are the main issues in breakdowns of conventional open pulley bearings.

However, by upgrading to sealed bearings, mine engineers can simply remove pulley bearings as a major reliability headache, and cause of production loss and downtime.

Engineered to minimize maintenance

Three-barrier solutions developed by SKF resist contamination by combining a taconite or custom-machined sealed housing with a biodegradable-grease barrier and sealed spherical roller bearing inside. This ensures that punishing conditions, such as dust, dirt, vibration and rigorous washdown procedures, do not cause any ingress of dirt or the escape of precious lubricant. The pulley bearing will keep on working with an average service lifetime of three times that of a conventional open bearing.

With the extended service life provided by SKF Three-barrier solutions, preventive replacement of pulley bearings can often be timed with major conveyor lagging maintenance. This means that the time-consuming intermediate pulley bearing exchanges or repairs can be skipped altogether providing a significant boost to conveyor uptime. In addition, grease consumption is reduced by 90% or more. This typically reduces preventive relubrication from once a week to every three months for a conventional open pulley bearing. Consequently, maintenance efforts are lowered even further while taking conveyor uptime to a new level.

No additional skills necessary

SKF sees enthusiastic support for its three-barrier solution among mining engineers. To facilitate the transition, the sealed bearings are the same size as their open counterparts. No extra training or tools are needed to install the new bearings. Most of the SKF Three-barrier solutions are readily available from stock.