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## Speedy overnight delivery of a crusher bearing saved the maintenance schedule at Outokumpu's Kemi mine

In order to minimize downtime, maintenance shutdowns at mines require careful planning. The precisely timed exercise is comparable to a Formula 1 pit stop. Outokumpu Chrome's chrome mine in Kemi, Finland – the only one in Europe – also goes through the exercise once a year.

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A recent spare part delivery, where a bearing for Metso's primary gyratory crusher was transported overnight from Sweden to northern Finland – a distance of more than 1,700 kilometers – in just 18 hours, was also an exercise in speed. The customer was able to stick to the shutdown schedule, and the robust gyratory crusher started crushing chrome ore exactly as planned.

'Metso has always been able to meet our expectations. The collaboration has been smooth, and Metso's experts have provided us with important crushing-related guidance. They have also always delivered the required spare and wear parts to our mine according to schedule', says Outokumpu Chrome's Underground Maintenance Foreman Jarkko Puumalainen.



Outokumpu Chrome's Underground Maintenance Foreman Jarkko Puumalainen is pleased with Metso's expert and spare part services.

'Due to an installation mishap, we unexpectedly needed a bearing during the maintenance shutdown, which is performed after every three million metric tons. Fortunately Metso's Trelleborg plant had the right part, and a van and two drivers came through for us in this challenging situation', Puumalainen comments.

'We keep critical spare parts stocked in Kemi, and the rest we order from Metso well before the maintenance shutdown. This arrangement helps to ensure that we can use the Superior® 50-65 primary gyratory crusher whenever the concentration plant needs it', he adds.

### Optimized wear parts guarantee economic operation

Metso's and the Kemi mine's experts have been collaborating on wear part optimization of the primary gyratory crusher for several years now, with the purpose of increasing the durability of the Superior® primary crusher's mantles and outer lining.

Chrome ore is challenging in terms of crushing. The crusher is fed by two vibrating feeders and one hydraulic push feeder in pulses, which means that the crusher cavity is rarely full, and most of the ore is crushed in the lower parts of the cavity. At times, the ore also has a high fines content.

Ore types vary greatly, as in addition to brittle and chalky feed, the crusher occasionally has to cope with very hard ore. The mine is currently starting the extraction of harder ore, which will also most likely result in increased wear, from the new ore body of Surmaoja.

### Longer life for outer lining

As a result of the wear parts optimization, extra-thick double-tier segments engineered by Metso are used as the concave liners. This increases the wear life of the concave liner to twice the life of the mantle.

'After three million metric tons of material has been crushed, the extra-thick concave liners are worn down to normal thickness and the worn mantle has to be replaced. At that point we only replace the extra-thick mantle, and leave the concave liners in place until the next replacement.

It brings us major savings in parts and the shutdowns are shorter. The modular feed hopper design enables quick replacement of the mantle, while replacing the concave liners takes about a week," Puumalainen explains.

### Digging deeper

Metso's Superior® primary gyratory crusher is currently in use roughly at the 500 meters level, with an output of around 1,000 metric tons an hour. The mine is extending to far greater depths, and the paved, sloping tunnel already reaches down to 890 meters.

The vertical sections of the flat ore body are unknown. Explorations of the vertical sections will be started in the coming years.

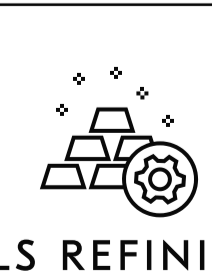
In 2014, ore production at the Kemi chrome mine totaled 2.4 million metric tons. Chrome ore production in 2015 is estimated to be around 2.1 million metric tons.

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