

# NEW COOLER SUPPORT

DESIGN OF A NEW SUPPORT SYSTEM FOR LKAB PELLET COOLERS



Photo from www.lkab.com, photographer: Fredric Alm

## RESULTS

The Sirius project resulted in a new cooler support, which is to be implemented and tested in one of the pelletising plants in Kiruna during the spring of 2015. Thanks to its flexibility, the new solution is easier to monitor and maintain than the previous design. It is also designed to facilitate the installation and service of the system. A double wheel design distributes the weight of the cooler more efficiently and balances the wheel construction to make sure both wheels are in contact with the rail.

## ASSIGNMENT

This project focused on the support system for the rotating cooler in the pelletizing plants at LKAB. Failure and subsequent replacement of the wheels of the existing support system have led to significant costs and lost production for LKAB. The current system was designed in the 1960's and has never been revised. A new solution must be able to carry the weight of the cooler with its capacity to cool over 500 tons of iron per hour. Accordingly, the solution had to be robust while at the same time adjustable and maintainable for varying cooler loads and geometries of the four pelletizing plants in Kiruna and Svappavaara.

## PROCESS

The process started by trying to understand and define the problems of the existing cooler support. The design space exploration involved qualitative interviews to gather opinions among the workers at LKAB, as well as visits to the pelletizing plants in Kiruna and Svappavaara. The group generated over 100 ideas that were gradually reduced to 10 concept proposals. The 10 concepts were presented to a selected group of engineers and maintenance staff at LKAB and the advantages and disadvantages of each concept were discussed. Based on calculations and simulations the 10 were finally reduced and combined into one final concept to be produced in the LKAB mechanical workshop and tested in the spring of 2015.

### WHEEL DESIGN

The wheel profiles reduce the weight of the wheels while retaining the strength. Holes in the wheel enable lifting with forklift.

### ROCKER BEARING

Facilitates an even distribution of the contact pressure, inspired by classic bridge constructions.

### CUSTOM SHAFT MOUNTS

Adapting the construction to four coolers with varying radius.

### WEAR SURFACES

Enables flexible service of the wheels.

### TRIPLE JACKS

Raise and lower the construction for easy installation and adjustment. Lock nuts secure the jacks by holding the full load mechanically.

### EYEBOLTS

For easy transportation of the construction during installation and service.

