



General view of LKAB's Malmberget facilities.

Electrical and Process Control Equipment for New Pelletizing Plant

In November 2004, LKAB announced that it was planning to invest SEK 2.6 billion in a new pelletizing plant (MK3) at its Malmberget iron ore mine in northern Sweden. This major investment will raise LKAB's annual production of pellets by about 2 million tonnes to a total of 25 million tonnes. It will also be possible to expand the production capacity at a later date.

By MARTIN D. BLAKE, MDB Communications

The new pelletizing plant is scheduled for completion in the autumn of 2006. It will receive iron ore mainly from the Malmberget Mine, but the Kiruna Mine will initially provide some ore. Blast furnace pellets will be the main product, but the new plant is also intended to produce direct reduction pellets.

The new plant is based on Outokumpu Technology's travelling gate concept. In the pelletizing process fine ground crude iron ore is

mixed with bitumen and additives. This mixture is then formed into spheres, which are sintered at a temperature of 1,250° C. When the new plant comes on stream, it will help LKAB achieve a still higher quality and increase the value added of the iron ore products.

In February this year ABB was awarded a SEK 190 million contract for the supply of the complete electrical equipment and process automation systems. The contract for the new pelletizing plant is shared by ABB Automation Technologies, Metals and Mining, Västerås, Sweden, and the Center of Excellence for Minerals Processing at ABB Switzerland, which has extensive experience of the execution of major mineral processing projects around the world.

Scope of delivery and project management

ABB is responsible for the complete project management, engineering, customer training, erection supervision and commissioning. Deliveries will include:

- Power factor compensation equipment
- Emergency power supply system
- Intelligent motor control centers
- Electric motors and drive systems including low- and medium-voltage drives to increase the efficiency of large process fans
- Instrumentation
- Industrial IT control based on the extended automation system 800xA
- Upgrading of the existing process control system for the ore concentrator, which separates iron ore concentrates and tailings
- Equipment for the railway loading/unloading station close to the Malmberget Mine

ABB has had long-standing relations with LKAB over the years, supplying such a diverse range of products and systems as complete mine hoists, drive systems, electric motors, control systems, equipment for port handling systems in Narvik and Luleå, ore train locomotives and underground transport systems. Another example is the complete modernization of the process control system at LKAB's Svappavaara concentrator and pelletizing plant that is being revamped by ABB over a three-year period up to 2006. This project also includes

the installation of new frequency converters and intelligent motor control centers.

'The execution of such a major project in a comparatively short time requires comprehensive resources,' says Petter Oscarsson, head of Swedish sales at ABB Automation Technologies, Metals and Mining. 'We'll be successful here, as has been demonstrated in earlier projects. Our strong local competence and our co-operation with the Center of Excellence for Minerals Processing in Switzerland with their experience are playing a vital role here.'

At the special request of LKAB, a completely new way of working, 'Partnering', has been adopted for the pelletizing plant project. As a consequence of this new method the customer and ABB are working closely together in a joint project planning organization.

'This requires more active participation of all those involved in the project. We'll work with, for example, the open reporting of the costs as well as with incentives instead of penalties,' continues Petter Oscarsson. 'This is a great challenge, but at the same time it opens the way to a new business culture. The partnership model with its open co-operation was in fact one of the reasons why ABB was awarded the contract.'

Focus on energy efficiency

In the environmental field an important goal for LKAB for many years has been to improve energy efficiency and lower energy costs. Here, the electric motor can be a major consumer of electrical energy in bigger plants. A pelletizing



From the signing of the contract.

plant, for example, needs a large number of motors for the driving of crushers, concentrator, pumps, fans, etc. It is estimated that LKAB today has some 15,000 electric motors in its facilities, with the majority being supplied by ABB. Electric motors in fact account for around 90 per cent of LKAB's annual electricity consumption of some 1.7 TWh.

About ten years ago LKAB decided to purchase only high-efficiency electric motors. Even if the purchase price may be higher, the lifetime cost of a high-efficiency electric motor will be substantially lower than for conventional motors. As an example, it can be mentioned that the cost of the energy consumed by a 37 kW motor over two months can

be as high as the price of the motor itself.

Today, LKAB has replaced most of its electric motors up to 160 kW with high-efficiency machines and is no longer rewinding older motors up to 160 kW. Further, LKAB now requires suppliers to provide guarantee values for their motors.

ABB has been a major supplier of high-efficiency motors to LKAB for their various facilities and they are also included in the delivery for the new pelletizing plant. Recently, ABB added to their series of high-efficiency process industry motors a new range of high performance motors for 11-160 kW. Today, there does not exist on the market any other range of motors with such a high efficiency. ■