

Ore Concentration

When it comes to driving grinding performance to higher levels, ABB offers a range of solutions.

For example, the Gearless Mill Drives (GMD) for SAG, ball and AG mills. This drive system eliminates the typical mechanical components of the drive train (shaft, gearbox, pinion and ring gear). ABB delivered the first ever GMD in 1969 and this unit is still in operation today. The upper limit of the power range today is about 35 MW. Actually the largest GMDs in the world will be supplied by ABB: a 28 MW GMD for a 40' SAG mill and two 22 MW GMD's for 28' ball mills, to be installed at the highest altitude ever of 4600 m above sea level.

With dual and single pinion drive systems ABB can offer an alternative for mill drive solutions up to a power of around 17 MW where, for the dual pinion solution, the load sharing is handled very accurately within the frequency converter system. ABB simplifies the twin drive system for the High Pressure Grinding Rolls (HPGR), among them, the one supplied for the worlds largest HPGR installed in Australia with a power rating of 2 x 2800 kW.

In addition to the drives solutions, ABB also engineers and supplies plant-wide electrification and automation solutions for hydro-metallurgical plants. Examples can be found in the many large concentration plants for iron ore, copper and other ores around the world.

Processing and Refining

From agglomeration processes such as pelletizing and direct reduction (DRI / HBI) of iron ore to the SX-EW, smelting and refining processes of non-ferrous metals ABB provides a wide range of systems and solutions such as high power converters, variable speed drives, power distribution, process control, instrumentation and process optimisation – linked together by IndustrialIT and combined with proven integration and project management expertise to ensure end-to-end plant connectivity and operational efficiency.

Process Optimization

Through its long involvement and experience in the mineral processing industry ABB has developed and successfully installed knowledge-based solutions. Creating value through integrated solutions for IndustrialIT is provided by OptimizeIT Expert Optimizer for increased production through better average grind size, lower specific energy cost, increased reagent efficiency and improved recovery. The InformIT Knowledge Manager provides important plant operational information such as metallurgical accounting, mass balancing, production and process management & KPI's, energy management and optimisation.

From copper and gold processing in China, Chile, Peru and North America, iron ore processing in Brazil and Venezuela to zinc processing in Australia, Canada and Peru, to name a few, ABB electrifies around the world.

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ABB in Mining & Mineral Processing From Mine to Market

Availability, Productivity and Profits

Costs of exploration and development in inaccessible areas. Volatile market prices. Rising costs. Safety of workers. Stringent environmental requirements. 100% availability, often in the harshest of climates. These are major challenges facing mining and mineral processing companies today.

Team up with ABB

Whether you are mining base metals, precious metals, coal, or industrial minerals, the key is to manage operations and information more productively. And availability of your equipment is crucial for your process – from the mine to your markets. For more than 100 years we have been meeting these challenges head-on. ABB's experienced engineers help you increase productivity and profits in mining and mineral processing operations worldwide.

Underground Mining

ABB has a unique position as a supplier of complete mine hoists, including both their electrical and mechanical equipment. It has delivered more than 600 hoists and undertaken the modernization of hundreds of existing plants worldwide. Working closely with the customers, ABB has introduced a number of technological breakthroughs for

mine hoisting systems, such as state-of-the-art drive and control systems, hydraulic disc brakes and controlled retardation, etc.

ABB has the capability to work with you from concept development through project execution to service and long term support. One stop shop! Our mining Centre of Excellence in Montreal has the largest team of dedicated hoist professionals in North America. This centre is also responsible for the engineering, sales and service of Kiruna electric trucks for the North American market. Kiruna electric trucks provide shorter cycle times up steeper inclines for the most efficient ore haulage with faster returns on net capital employed and minimal environmental impact.

State-of-the-art drive and control systems

The latest technology for drive systems including Direct Torque Control (DTC) for torque and speed control of AC motors is now well proven for hoist applications. The first system to be installed is the mine hoisting system at Pyhäsalmi Mine in Finland. It has by now been in commercial operation since 2001 with the highest possible availability. This new drive system offers high efficiency, superior control performance, low voltage drop in the supply network and low harmonic distortion as well as very low flicker. As of 2008 ABB has been awarded more than 50 contracts of this kind for friction and double-drum hoists for motor powers up to about 10 MW.

Complying with stringent safety and availability requirements of mine hoist

applications, ABB's powerful, user-friendly control system is based on IndustrialIT technology that includes control of feeders, conveyors and measuring flasks at the loading level as well as pushbutton control of multi-level man/material hoists. The AHM Advant Hoist Monitor is an independent unit that provides protection against over-speed and over-winding.

Hydraulic disc brakes and controlled braking

Multi-caliper disc brakes are used for emergency stop and holding at standstill. The hydraulic control unit is equipped with dual systems to meet the highest safety requirements. Controlled retardation maintains the set retardation rate independent of the actual payload and direction of movement.

Open Cast (Pit) Mining

Large open cast mining operations throughout the world have used control and drive systems from ABB for decades. ABB electrifies and controls the full range of new and used mining equipment, including bucket-wheel and bucket-chain excavators, spreaders, belt-conveyor systems, belt wagons, stackers-reclaimers, crushers, shovels and draglines. The high reliability and top performance of ABB equipment have been proven to withstand the extreme conditions of open cast mining – with dust, severe vibrations, and temperatures ranging from -50°C to +50°C – in over 1,000 large mining machines during the past 50 years.



Power and productivity
for a better world™ **ABB**

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From Mine to Market

Look no further than ABB. At ABB, our approach covers the complete value-added chain, from your mine to the product you market. We excel at merging equipment, skills, and services to develop a complete, customized solution to strengthen your entire operation, from mine to market, regardless of project size. ABB's capabilities and global and local resources offer integrated power, control, and information solutions. You specify the requirements just once, and we take the responsibility for creating a solution that works smoothly and efficiently. Above all, it is a solution based on our solid, worldwide experience in the industry.

Drives Applications

You need more than electrical knowledge to interpret application specifications and select the correct drive system. ABB engineers and manufactures motors and drive systems worldwide, from sub-kilowatt applications to the megawatt ratings of gearless drives for the largest SAG and ball mill applications. As a global leader, ABB combines its extensive industry knowledge with its application expertise to select the most economical drive solution for your particular, often unique circumstances. From single/dual pinion and high pressure grinding rolls to material handling, pumping and conveying systems, we continually strive for the highest availability, productivity and energy efficiency your operations can achieve.

Process Control and Automation

Mines and processing plants need integrated process control systems that can improve plant-wide efficiency and productivity. Our Industrial^{IT} solutions for process control, optimization and management information provide easy access through a «single window» to the process, production, quality and business information – from the most remote location to corporate headquarters. Whether you are building a green-field plant, extending or modernizing an existing plant, ABB provides tailored automation solutions that use real-time data – enabling constant monitoring and analysis of your process combined with improved asset availability.

Power Distribution and Conversion

When you need efficient and reliable power distribution in your mining and mineral processing operations look to ABB. We offer the broadest range of high, medium and low voltage equipment for switching and distributing electrical power. Solutions are engineered for safety, flexibility and security to keep operations running day and night, including emergency power generation and UPS, industrial sub-stations, power factor compensation and harmonic filtering equipment, switchgear and transformers. ABB is a leading supplier of rectifier systems required as a key element in the electro-winning process. ABB provides you with state-of-the-art technology to exceed today's rigorous demands.

Services

Mining and processing thousands of tons of ore in a rugged environment places substantial demands on well trained human resources complemented by fast response service capabilities of the major equipment suppliers. Life cycle support: ABB has an extensive network of local service centers to support your facilities. Our expert field engineers are available day or night to diagnose, repair, upgrade, install or perform on-site maintenance for ABB systems. Reliability management services the local centers can also provide training to your operating and maintenance staff in the local language. When it comes to service, ABB focuses on helping your company succeed.

ABB in Mining & Mineral Processing



Northern Ontario electro-winning plant 110Vdc at 44,000 Amps, 0.99 PF



Gas insulated switchgear and industrial substations in an aluminum plant in Canada. Several references in America



Automation and drives for draglines and shovels at the Canadian Oil Sands and in Mexico



Team of more than 15 project managers devoted exclusively to large mining projects in North America



Infrastructure: grounding, lightning protection, lighting, cabling, communication systems, fire protection



Emergency power generation and UPS



Static VAR compensation and harmonic filters



Multiple site locations in North America, offering:
- 24hrs support line
- 24hrs parts line
- reliability consulting
- remote access & diagnostic



Transformers, rectifiers, switchgear and power factor correction



Process optimization and management



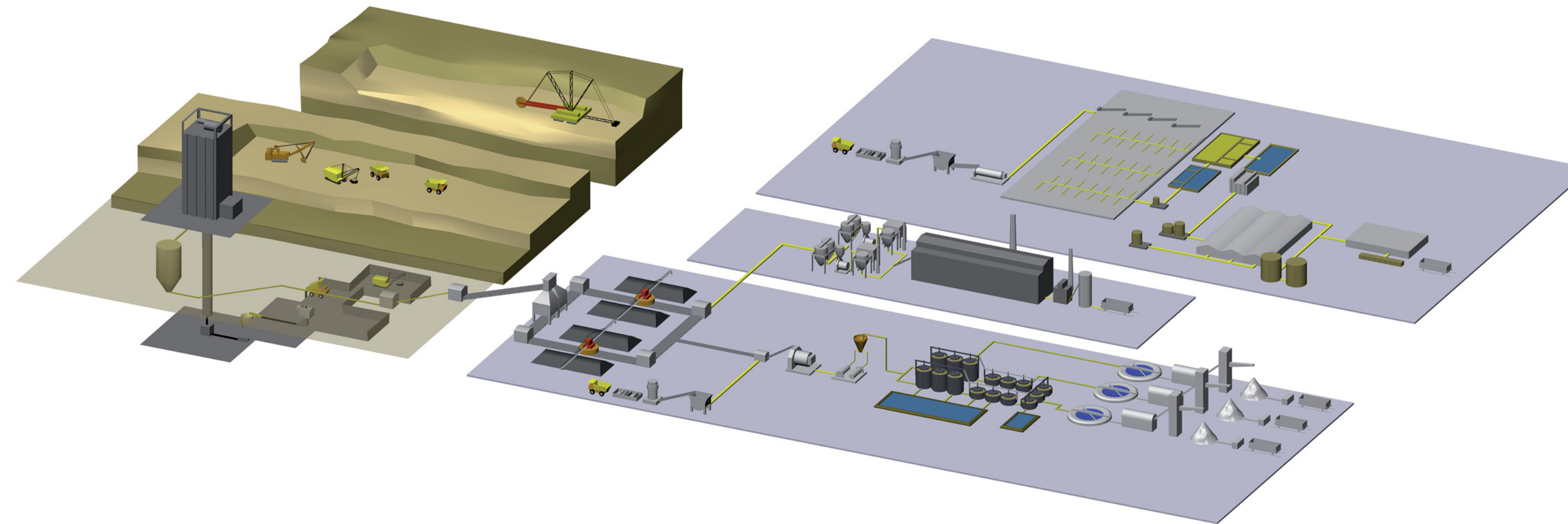
Hoist haulage system in Saskatchewan. Over 150 references in Canada and USA, 650 worldwide



Power circuit breakers, relays, disconnect switches



Explosion proof equipment



ABB's Strength

ABB is a global leader in providing state-of-the-art technology to mining and mineral processing companies.

While ABB can access the best technology from anywhere in the world, its strong presence provides complete support through the life cycle of an installation – including engineering, training, commissioning, service, and support – every day of the year. As a technological leader, ABB optimizes processes wherever mining and mineral processing are done.

Because of its vast global resources, ABB can provide you with many advantages, from supplying a single product to delivering large turnkey electrification for all stages of mining and mineral processing, including such solutions as distributed control systems, sensors and instrumentation, drives and environmental products.

ABB is well positioned to help you achieve industrial efficiency and environmental compliance with products, systems and services that ensures product quality, minimizes environmental impact and reduces production costs.



One of many turnkey surge plants delivered to the Canadian oil sands



High voltage turnkey sub stations throughout Canada and USA



Main power supply and rectifier at a Canadian smelter



Electrification of crushing plants at the Canadian oil sands project



Statcom in an underground potash mine in Canada



Ore pocket weighing systems



Drive and control systems for open pit mining equipment



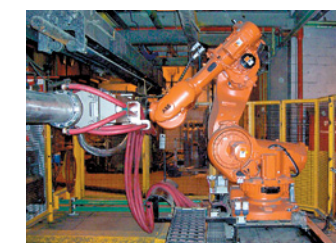
Processing plant automation and central control



Material handling systems – several projects in North & South America



AC/DC drives, drives systems and motors



On-line accretion removal sever duty smelter application by Lewis Australia using ABB robots. Reference northern Ontario smelter



Gearless mill drives – multiple sites globally including Canada and USA



Integrated plantwide distributed control



Motor control centers – Arc resistant, NEMA or IEC



Underground electric haulage trucks available per unit or as a complete solution. NA references in northern Ontario and USA.



Total mine electrification and automation, including ventilation on demand. "The Mine of the Future" Reference: northern Ontario