Business Unit Mining

Agenda

- ABB Structure
- Overview of BU Mining
- Product Groups
  - Electrification, Control & Instrumentation Systems (ECIS)
  - Underground Mining
  - Material Handling & Grinding
  - Service
How ABB is organized
The way to your industry

Corporate Functions
Division Power Products
Division Power Systems
Division Discrete Automation and Motion
Division Low Voltage Products
Division Process Automation

Local operation and service centers
Argentina, Australia, Brazil, Canada, Chile, China, Colombia, Germany, Greece, Indonesia, Kazakhstan, Malaysia, Oman, Peru, Poland, South Africa, Sweden, Switzerland, and USA.

Main technology centers
Underground mining (Sweden)
Material handling (Germany)
Electrical, control & instrumentation systems (Switzerland)
Grinding solutions (Switzerland)

Business units
Mining
Control technologies
Full service
Measurement products
Marine & cranes
Oil, gas & petrochemical
Paper, metals & cement
Pulp & paper
Service
Turbocharging

Industries served:
Copper, gold, iron ore, coal, various other commodities
Business Unit Mining Overview

- Worldwide responsible unit offering turnkey solutions for the electrification, automation and optimization of the complete plant solution.
- Combines global and local ABB competencies and resources as needs dictate.
- About 2,000 employees in 27 countries
- Three industry focused Main Technology Centers:
  - Switzerland, Sweden and Germany
- Utilising Global manufacturing resources.
Business Unit Mining Expertise

- Plant and systems engineering
  - Plant electrification
  - Automation and instrumentation
  - Drives and motors
- Service
  - Life cycle services
  - Asset management solutions
# Business Unit Mining

## Product Groups

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<th>MH&amp;G</th>
<th>SERVICE</th>
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Business Unit Mining
Product Group ECIS
Complete plants or individual products for:
- Gold, copper and platinum mining & processing industry
- Iron ore processing industry
- Uranium and coal mining and processing plant
- Other ore mining & processing industries
PG ECIS
Scope

Engineering, Procurement, Construction, Management, Service

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<th>Infrastructure</th>
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<td>HV/LV drives &amp; motors</td>
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<td>Optimization Packages</td>
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<td>Lighting</td>
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<td>DC Power</td>
<td>Rectifiers</td>
<td>“Smart” MCCs</td>
<td>Ventilation Air-Condition.</td>
<td>Operations Assistance</td>
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<td>Emergency Power</td>
<td>Power Factor Correction</td>
<td>Application Software</td>
<td>Communication</td>
<td>Life Cycle Support</td>
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PG ECIS
From product supply to plant solution

- Electrical and control – turn key
- Integrated engineering / composite plant
- Erection supervision

- Services
- Main substation
- GMD / Mill drives & PFC study
- MV distribution
- Motors & drives
- E-houses
- Process control
- Infrastructure

- Engineerered packages
- Plant solution

- Bundled products
- Sales coordination / Common terms and conditions with any combination of products

- HV Substation
- PFC & filter
- MV Motors
- Variable speed drives
- Process control
- CPM solutions
- Instrumentation
- MV switch-gear
- LV Motors
- LVD/ MCC

- Power trafo
- Distribution trafo
Integrated EC&I systems
Capabilities & services

- Power Factor Correction System
- Mv Switchgear
- Power Transformer
- Over Head Lines
- HV Switchgear
- Control System
- Instrumentation
- LV VSD
- Motor Control Center
- Containerized Electrical Room
- LV Motor
- MV Motors
- MV VSD
- Distribution Transformer
- Drive Transformer
PG ECIS
Advanced control and drive systems

- extended operator workplace
- operation, engineering and maintenance
- process optimization
- production management
- ERP and business IMS systems
- mobile / remote operation engineering and maintenance

- main process and power control

800x:A integrated sub systems

Process Plant  Mine Operation  Material Handling
ABB Business Unit Minerals provides the following scope and services for EC&I solutions

- Planning (feasibility studies, conceptual design, tendering)
- Product supply
- Engineered products (hardware and software)
- Control system process application design plus EC&I integration
- Interface and wiring engineering
- Infrastructure and cable engineering
- Erection and commissioning
- Maintenance and support
PG ECIS: Scope
Business Unit Mining
PG Underground mining
PG Underground Mining

Overview

Main Technology Center – Sweden and S.A.

Customised solutions for:

- Mine winders
- Winder upgrades
- Ventilation on demand systems
PG Underground Mining
Mine Winders

Solutions for:

- Complete Mine Winders - both **Mechanical** and **Electrical**
- New winders and winder upgrades
- Refurbishment of existing installations
- Replacement of brake systems and hydraulic power pack
- Service and maintenance
- Annual compulsory inspections
PG Underground Mining
Expertise in Winders

Winder Configurations and Services:
- Single Drum Winders
- Double Drum Winders
- Blair Multi Rope (BMR) Winders
- Koepe (Friction) Winders
- Finite Element Analysis Studies
### Main content:

**Control and Monitoring system incl. HMI**

Drive systems AC and DC

Brake system with brake units, brake stands and hydraulic units

Pulley with brake disc, shaft and bearings

Sheaves

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PG Underground Mining

Winders - Typical Scope

- Main Control Desk
- Hoist Control Cubicle
- Shaft level equipment
- Cage level box
- Dumping
- Loading
- Profibus
- Process Portal Compact HMI
- Compact HMI
- Ethernet
- Module bus
- VSD
- Transformers
- Exc.
- PE
- PG
- BCC
- AHC
- TG
- PG
- VSD
- Transformers
- Exc.
- PE
- PG
- Drive
- AHM
- Hoist Brake Hydraulic Units
Mine ventilation accounts for a great portion of an underground mine energy consumption – up to 45%.

OMVOD - Energy management system - important to be competitive as energy prices are rising.

Increased energy consumption due to deeper extraction, more efficient production and aggressive mineral pricing.

Underground mines need to be ventilated to remove hazardous substances.

Create a fresh environment and climate for the workers in the mine.

Concentrate the ventilation demand where there are activities only.
Business Unit Mining
PG Material Handling & Grinding
PG Material Handling and Grinding

Overview

Customised solutions for Open cast mining & material handling
Main Technology Center: Germany
- Continuous mining equipment
- Material handling
- Conveying

Customised solutions for Grinding
Main Technology Center: Switzerland
- Gearless Mills, Single & Dual Pinion Mills and High Pressure Grinding rollers
- Crushing
PG Material Handling and Grinding
Open cast mining

Responsible for electrification and automation of:

- Bucket wheel excavators
- Draglines & Shovels
- Overburden Bridges
- Stockyards
- Stacker / Reclaimers
- Spreading and Blending
- Central Control rooms and stockpile management systems
PG Material Handling and Grinding Scope - Open cast mining

Open Pit Mining

Continuous Mining

- Soft- Medium Material Overburden, Lignite, Coal
  - Bucket Wheel Excavator
  - Belt Conveyor
  - Spreader

Discontinuous/Continuos Mining

- Soft- Hard Rock Material Overburden, Metallic Ores, Hard Coal Oil Sand
  - Belt Conveyor (overland)
  - In Pit Crusher/immobile/mobile
  - Dragline
  - Shovel
  - Truck

Scope - Open cast mining
PG Material Handling and Grinding

Material handling

- Engineered Solutions for conveyors:
  - Geared or gearless conveyor drive systems
  - Regenerative power on downhill lengths
  - Mobile in-pit crushing and conveying equipment
  - Longest conveyor system – 51 km (20 & 31 km)
Engineered Solutions for Comminution:

- Gearless Mill Drives
- Single and dual pinion ring gear mill drives
- High Pressure Grinding Rollers drive systems
PG Material Handling and Grinding
Grinding & crushing

- Gearless mill drive systems
  - Most efficient mill available
  - Power Level: 4-35 MW up to 42 ‘ diameter
  - Over 60 installations Globally

- Single / Dual pinion ring gear mill drive systems
  - Powerful Mill Controller Application with
    - Frozen charge detection and removal function, controlled roll back,
    - mill positioning. Inching and creeping functionality
  - Power Level: 0.5 to 18 MW
  - Low and High Speed Solutions

- High Pressure Grinding Rollers
  - LV and MV Motor and VSD Solutions
  - Power Level: 300 kW to 3 MW
Business Unit Mining
PG Service
PG Service Overview

- 20,000 direct service employees worldwide in 100 countries.
- 450 Plus Service Personnel in South Africa and SSA
- Most comprehensive Service portfolio on the market
- We are backed up by a global service infrastructure of product and solutions experts, advanced software tools, and a global communications infrastructure
- We have advanced tools, training and methods for Maintenance Excellence
- Together with our Global experts, we can deliver specific expertise anywhere and anytime it is needed.
PG Service
Service portfolio

- ABB Service has over 20,000 people in 100 countries and is today a business of over 5 billion USD serving everything from automation and instrumentation, to power generation and substations.

- Portfolio:
  - Life-cycle services on ABB’s installed base
  - ABB Full Service®
  - Training
PG Service Lifecycle Services
1. **Spare Parts (contracts)** – spare parts and spare parts kits, inventory management and logistics solutions, repair

2. **Support and long term maintenance services (contracts)** – diagnosis, maintenance and field services, repair and refurbish, support and remote services, maintenance activity plan, extended start-up support, resident engineers, maintenance strategy and tools, supervision

3. **Asset optimization - engineering and consulting (contracts)** – identify opportunities and implement solutions to improve system and equipment performance, production processes and regulatory compliance

4. **Retrofit and modernization** – environmental services, extension, migration and upgrades, retrofit

5. **Training** – for customer’s personnel, educational partnerships, training demo unit supply and integration
Business Unit Mining
Mining – how can we assist you

**ECIS**
Minerals and Aluminum Mining & Processing
Integrated Automation
Instrumentation
Electrical Power Distribution

**UGM**
Integrated Mine Automation
UGM Electrification
Hoisting
Ventilation On Demand

**MH&G**
Mobile Mining Equipment
Material Handling
Crushing & grinding
Stockyard Management Systems

**SERVICE**
Advanced Service & Training Solutions
Services Agreements
Spare Parts
Maintenance & Repairs
Up-grades and Retrofits
Power and productivity for a better world™