

Solutions for conventional power generation  
Enhanced performance, efficiency and  
reliability



ABB is one of the world's leading power and automation technology companies. It provides integrated power and automation solutions for all types of power generation plants, including coal, gas, combined-cycle, nuclear, hydro, waste-to-energy, and a range of renewables such as biomass, solar, wind, tidal and wave. ABB technologies and services help optimize performance, improve reliability, enhance efficiency and minimize emissions throughout the plant life cycle.



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Note: In this brochure ABB defines conventional power plants as those that burn fossil fuels such as coal, natural gas and oil, as well as nuclear power plants. Hydro power plants are also covered, even though they do not fall within the above definition of conventional power plants.

# Challenges for conventional power generation

ABB has a long history of supplying products, solutions and services to renewable and conventional power generation. We understand that even though energy generation from renewable sources is increasing, conventional power plants will remain the backbone for a secure supply infrastructure in the foreseeable future — but not without challenges.

## Operational flexibility to meet load fluctuations

With the increase in renewable energy, power producers are facing new challenges. In the past, coal and gas-fired power plants had to offset fluctuations in power consumption only. Today they need to continuously balance renewable energy feed-in fluctuations to provide grid stability. The need for frequent load adjustments requires a higher degree of operational flexibility from coal, gas-fired and hydro power plants.

## Improving efficiency to remain competitive

Power producers operate in a highly competitive marketplace. Business pressure from market liberalization and rising fuel costs require every producer to look for the most effective ways to convert a bigger share of fuel's energy into salable kilowatt hours (kWh). Improving the heat rate of power plants is becoming increasingly important.

A thermal power plant usually consumes 5 to 10 percent of the electricity it produces. Due to the installation of anti-pollution devices this share has been increasing in recent years. Improving the plant's efficiency is the most cost-effective way to increase its heat rate and power output.



### ABB, your partner in power generation

At ABB, we understand the demand on conventional power plants to become more competitive; to be more flexible and efficient and provide more output at lower cost and with fewer emissions.

With over a century of power generation experience and an extensive portfolio of products, solutions and services, ABB is here to help improve your plant's reliability and availability, optimize its efficiency and performance and minimize its environmental impact.

### A complete range of products, solutions and services

ABB offers an extensive selection of products, solutions and services which provide safe and efficient performance throughout the entire power generation cycle.

- Motors and variable-speed drives
- Generators
- Mechanical power transmission products
- Generator protection and circuit-breakers
- Switchgear and motor control centers
- Excitation and synchronization systems
- UPS and power conditioning systems
- Transformers
- Measurement and analytical solutions
- Low voltage electrical products
- Control systems
- Life cycle services



# Product and solution highlights



## Motors and variable-speed drives

ABB offers the widest selection of motors and variable-speed drives for applications such as fans, pumps, conveyors, compressors and crushers. The offering includes LCI-type medium voltage soft starters for gas turbines and pumped storage power plants.



## Generators

ABB offers a broad range of generators powered by gas and steam turbines, gas and diesel engines and wind turbines, with extensive applications experience from thousands of installations around the world.



## Excitation and synchronization systems

With its world leading position, ABB offers the complete range of excitation systems, combined gas turbine starter and excitation solutions, as well as synchronization systems.



## Generator protection

ABB's portfolio includes generator protection for all types of generators.



## Generator circuit-breakers (GCBs)

ABB offers the widest and most modern portfolio of GCBs in SF6 and vacuum technology across a wide range of short circuit ratings to meet the demand of all types of power plants.



## Mechanical power transmission products

A wide range of mechanical power transmission products such as enclosed gearing, couplings, mounted bearings and conveyor components.



### UPS and power conditioning systems

Industrial UPSs, active voltage conditioners and reactive power conditioners to deliver reliable supply of clean power for SCADA, DCS, turbine controllers, fire and gas systems, emergency lighting, security and telecommunication systems and low power loads such as motors and pumps.



### Transformers

ABB offers a complete range of power and distribution transformers, including liquid-filled and dry-type.



### Switchgear

A complete portfolio of low, medium and high voltage switchgear and motor control centers.



### Measurement and analytical solutions

A broad range of measurement and analytical solutions designed to maximize power plant efficiency. From boiler optimization, to turbine efficiency and emissions control.



### Low voltage electrical products

ABB provides a full range of low voltage solutions to connect, protect, control and measure a wide range of electrical installations, enclosures, switchboards, electronics and electromechanical devices.



### Control systems

ABB's offering includes SCADA and DCS power automation solutions for plant control and optimization as well as DCS turbine control systems for steam, gas and hydro turbines.

# Life cycle services

ABB products and solutions are backed by comprehensive life cycle services, from the customer's initial inquiry throughout the product's entire life cycle.

ABB offers a comprehensive portfolio of life cycle management and service products for the power generation industry; from installation and commissioning to operation and maintenance, upgrades and retrofits and replacements.

ABB protects your investment through the stepwise evolution and upgrading of your equipment to minimize energy consumption, prolong asset operating life and minimize the cost of ownership.

## Installation and commissioning

ABB's certified commissioning engineers have extensive know-how and experience, which makes commissioning fast and smooth and lays the foundation for high reliability and efficiency.

## Operation and maintenance

The equipment performs critical duties in the power generation process and its failure may result in loss of production and

revenue. ABB provides remote services for fast failure analysis as part of its maintenance program.

Implementing ABB's preventive maintenance schedules reduces the risk of failure and increases the lifetime of the equipment, lowering overall operational costs. ABB developed preventive maintenance kits containing genuine spare parts, helping to swiftly retaining production uptime.

ABB can also help plan spare part stocking throughout the life cycle of the equipment.

## Upgrades, retrofits and replacements

ABB provides upgrade services to improve the performance and extend the functionality and lifetime of products and systems. ABB also offers retrofits and replacements. Depending on the situation, a retrofit can be a more economical way to modernize an old installation by reusing all relevant parts of the



original equipment and purchasing new parts where necessary.

### Technical support

Throughout each and every life cycle stage, ABB offers technical support and advice. On customer request, a 24/7 support line for getting instant advice by ABB's certified engineers, and on-site field support can be provided.

### Training

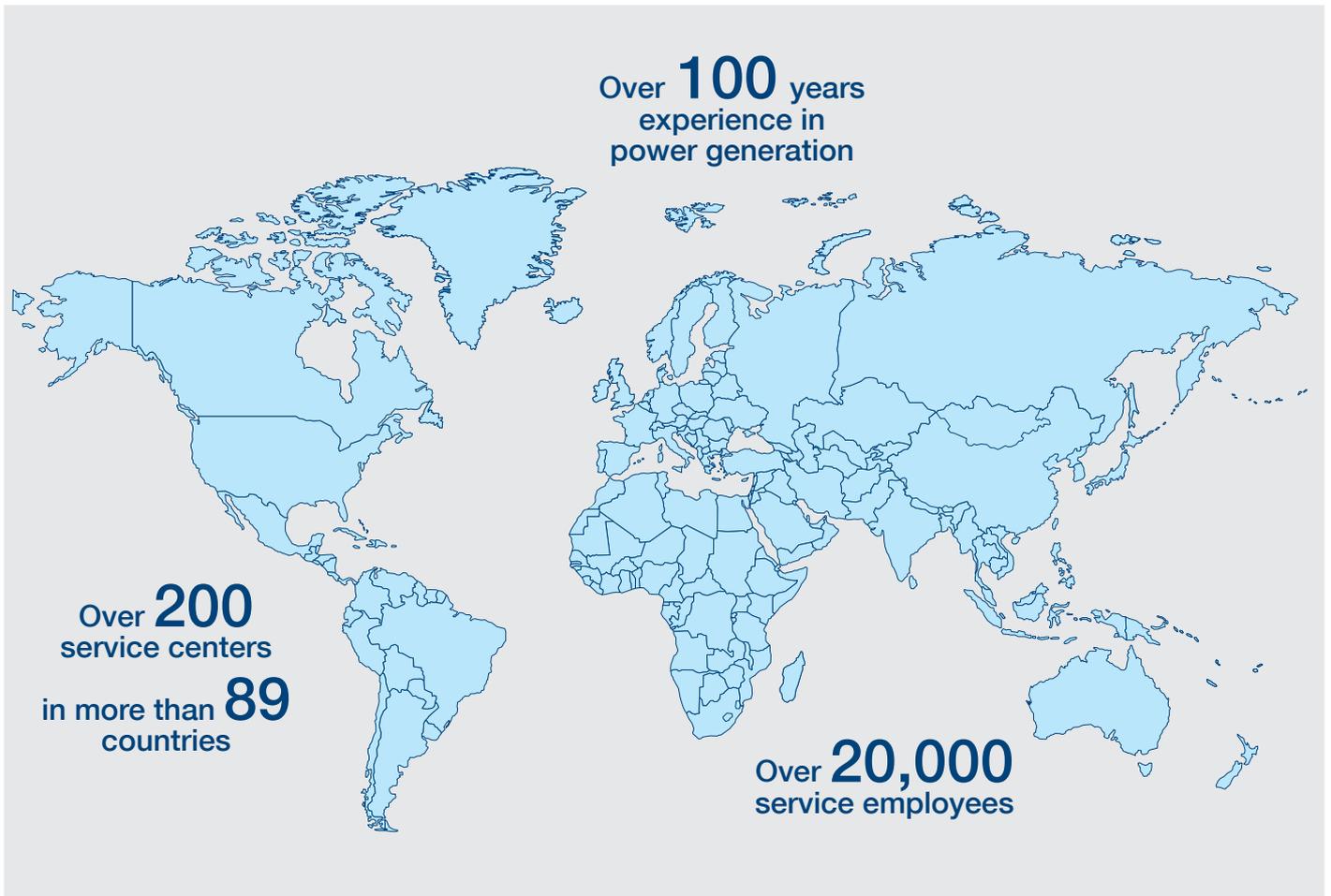
ABB provides a wide selection of product-specific training to OEMs and plant operators. The training can take place at ABB training centers or at the customers' locations.

### Service agreements

Depending on the needs of the OEMs or plant operators, ABB can bundle individual services into one contract. A contract can be made at any stage of the equipment's service life.

### Life cycle services

- Service agreements
- Installation and commissioning
- Training
- Spares and consumables
- Maintenance
- Repairs
- Engineering and consulting
- Extensions, upgrades and retrofits
- End-of-life services
- Replacements
- Advanced services for production optimization and energy efficiency



# References

With over a century of experience in power generation, ABB has the know-how and experience you can trust.



## Grosskraftwerke (GKM) Mannheim, Germany

ABB supplied medium voltage drives for the refurbishment of the 280 MW boiler of block 6 at GKM's coal-fired power plant. Two out of three boiler feed-water pumps of 5.8 MW were retrofitted with variable-speed drives, replacing the hydraulic couplings which had a poor efficiency. The replacement resulted in energy savings of more than 12,000 MWh per year and a reduction of CO<sub>2</sub> emissions by about 10,000 tons per year.



## Mälarenergi, Sweden

ABB supplied medium voltage drive systems to Mälarenergi, a city-owned electric power and district heating provider based in Västerås, Sweden. An ABB energy audit had revealed a huge energy saving potential by upgrading the district heating pumps with variable-speed drives. Four resistors and slip-ring motors were replaced with variable-speed drive systems, each rated at 1,765 kW. The heat losses caused by the flow control method were reduced considerably and the production of electrical energy was increased by 35 GWh per year.



## Riskulla, Sweden

ABB supplied more than 100 motors powering pumps, fans, conveyors, screen shakers and crushers, more than 60 variable-speed drives and the ABB 800xA control system to the combined heat and power district heating plant. Energy savings of up to 80 percent can be achieved by using drives instead of throttle valves and guide vanes to adjust the flow of air and water.



## Essent, Claus C, the Netherlands

ABB supplied MEGATROL gas turbine starters and UNITROL® 6000 excitation systems to the 1,300 MW combined cycle power plant in Maasbracht, the Netherlands. The equipment ensures power availability through cross start.



#### Malta hydro power plant, Austria

The Malta hydro power plant began operation in 1978. It consists of several hydro power stages with the upper stage being the largest storage lake in Austria. The power station has two machine units with a total installed nominal output of 120 MW. Each machine unit is made up of one pump turbine and one motor/generator set. As part of a modernization project, the excitation systems of the generators were replaced with ABB's static excitation system UNITROL® 6000. With the modernization, the power plant meets the latest requirements for grid stability, increasing the availability of the plant.



#### Kraftwerke Oberhasli (KWO), Switzerland

ABB supplied the world's most powerful frequency converter for pumped storage to the Grimsel 2 plant of KWO. The plant connects the upper reservoir to the 400 m lower lake. In the past, pump operation could only be controlled by regulating the number of pumps in operation up to a maximum of four. The 100 MW converter allows the speed of one of the pumps to be controlled according to the surplus energy available. The pump can now be started, operated and stopped more quickly, and water used more efficiently and flexibly for power production.



#### Valorsul waste-to-energy plant, Portugal

Valorsul operates a waste-to-energy plant close to Lisbon center, which converts waste into electricity. It has three blocks and a total capacity of 50 MW. The plant receives about 2,000 tons of waste per day and produces enough energy to supply a city of 150,000 inhabitants. Six ABB variable speed drives have replaced damper control on the plant's induced draft fans and secondary air fans. The result is an annual energy saving approaching € 240,000.



#### Suralaya power plant, Indonesia

ABB energy efficiency improvements are saving the equivalent of 10,000 MWh of energy per year at Indonesia's largest coal-fired power plant, the 3,400 MW Suralaya generation station on the island of Java. It is owned by PT Indonesia Power. The energy savings in the 400 MW Suralaya Unit 2, one of the power station's seven generating units, was the result of a multi-stage ABB Service energy appraisal, followed by a feasibility study, master plan and implementation process.

# Contact us

For more information contact your local ABB representative or visit:

[www.abb.com/powergeneration](http://www.abb.com/powergeneration)

Watch the video on YouTube:



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