



Water Industry Sector

Products and solutions for pumping stations
Enhanced plant performance, efficiency
and reliability

Power and productivity
for a better world™



Moving Water Everywhere



A global challenge

Nearly twenty percent of the world's energy is employed for pumping and a majority of that is used for water pumping, a key process in the water lifecycle.

Pumping stations are used for reliable and efficient transport and distribution of fresh water to guarantee the availability of this precious resource for human consumption, and for industrial and agricultural production, for waste water discharge or for seawater intake at desalination plants. The challenges for creating new infrastructures as well as modernization of existing ones are not only limited to ensure the basic availability of water but also to guarantee a sustainable development considering important factors like energy efficiency, productivity, reliability and life cycle cost.

Technology and process know-how

The ABB portfolio includes products and solutions covering the entire electrical and automation scope for pumping station projects: drives and motors, soft-starters, low, medium and high-voltage switchgears and components, transformers, instrumentation, control products and PLCs (Programmable Logic Controllers), DCS (Distributed Control Systems), and optimization and asset management tools.

Moreover ABB provides engineered packages as well as turnkey pumping stations, including electrical and mechanical BoP (Balance of Plant).

- Complete and reliable portfolio
- System integration and optimization
- A presence in over 100 countries

From Products to Turnkey Projects



A leader for integrated solutions

ABB combines in-house technology with process know-how to develop complete and integrated solution. We serve end users, EPC contractors, and pump OEMs, delivering turnkey pumping stations, integrated systems, power and automation products.

ABB is the ideal partner for large water transfer projects and can take the responsibility for building complete solutions, including pumping stations, electrical substations, pipeline control systems, and communication networks. By serving as a single interface for the project, we reduce costs significantly.

Electrical balance of plant

ABB offers integrated electrical balance of plant solutions for pumping stations. We have the knowledge to assess the degree of customization required, and we have the electrical products and services to create a fully integrated solution. Electrical balance of plant covers electrical equipment and systems from pump level up to grid connection, ensuring that the pumping station runs efficiently, safely, and reliably. ABB (eBoP) solutions include the following equipment and systems: high-voltage substations, grid connections, medium-voltage systems, low-voltage systems, emergency systems, and facility management. ABB is a single source for design, engineering, supply, installation, commissioning, testing, and maintenance, reducing the cost of ownership.

- Design
- Engineering
- Procurement
- Installation
- Commissioning
- Service & Maintenance

Power and Automation



Motor and drives: a choice to increase efficiency

Motors and drives play a significant role in pumping stations and can drastically affect the long-term operational management of pumping stations.

ABB motors and drives – which can be used for regulating a variety of pumps, bring many benefits, including efficiency improvements, energy savings, and reduced wear and tear on moving equipment.

ABB is a world leading supplier of highly energy efficient motors. We deliver a full range of high efficiency and a broad range of premium efficiency as well as super premium efficiency motors. Using our motors will substantially contribute to make your operation more energy efficient. ABB variable speed drives (VSDs) are used to control the motor speed of pumps with a typical 30 to 60 percent savings in energy consumption. The use of drives also reduces mechanical and electrical stress on pumps and aeration equipment components.

VSD's in combination with high efficiency motors does not only make water processes in all parts of the water cycle more efficient, but also help reduce maintenance costs.

Instrumentation and Control

ABB's programmable logic controller (PLC) and supervisory control and data acquisition (SCADA) platforms as well as our distributed control system (DCS) provide an innovative, consistent and flexible control solution for small to large size pumping stations. The solution handles all plant operations as well as information management (historian functions, archiving, reporting, performance calculations) and optional added-value applications, such as Pump Efficiency Monitoring System (PEMS), simulation and leakage detection.

ABB's instrumentation portfolio includes flow, pressure, and level measurement, quality analyzers and recorders. Field devices, instrumentation, and control systems can be easily integrated to deliver complete plant automation solutions.

- Measurement, monitoring, and control
- Energy management
- Performance optimization
- Longer asset life

Added-Value Applications



An easy way to plant optimization

The ABB portfolio includes a suite of dedicated software applications for pumping stations. The Pump Efficiency Monitoring System (PEMS) provides rapid and detailed real-time information on pump efficiency. Based on a thermodynamic measuring method using ABB patented components, this solution calculates pump efficiency by processing water temperatures, pressures, and the motor power associated with each pump. Customers are able to monitor the status of their assets and improve maintenance activities.

Less stress means cost savings

The ideal solution to reduce pressure surges and mechanical stress is a gradual startup and shutdown of the pumps, using (for instance) a soft-starter with torque control. This approach prevents damage to pipelines, less wear and tear on pumps and guarantees better management of water networks. ABB products and automation solutions reduce stress on the pumps and allow more flexible management, slowing down the ageing process of key components.

From single plant to water networks

A single pumping station is often part of a complex water network. To manage cascaded pumping stations and complex transmission and distribution schemes, ABB developed advanced solutions for on-line monitoring and control, network management, simulation and leakage detection.

- Simulation
- Water management
- Pump efficiency
- Leakage detection

From Challenge to Projects



Abu Dhabi: long-range power and control

ABB supported Abu Dhabi Water & Electricity Authority (ADWEA) by delivering the complete electrical, control, and instrumentation system for the Shuweihat Water Transmission Scheme, one of the most important projects ensuring adequate supplies of water in the United Arab Emirates. Water is transferred from the Mirfa Pumping Station to the Mussafah Pumping Station and further on to the Unit IV Pumping Station and Distribution Network in Abu Dhabi.

The system includes a parallel double pipeline 1.600 mm in diameter. Each pipeline is 250 km in length, with a transfer capacity of 375.000 m³/day. ABB's solution (including engineering, installation, and commissioning services) integrates a wide range of ABB products: medium and low-voltage switchgears, power, distribution and phase shift transformers, motors, variable speed drives, DC/UPS systems, automation system, and field instrumentation – all under the control of a SCADA and telemetry system that allows centralized management of the plants.

Mubarak: the world's largest pumping station

Collecting water from Lake Nasser is one of the basic irrigation aims of the Egyptian government. Water transfers to the irrigation area via the Sheikh Zayed canal system through the Mubarak Pumping station in Toshka. This gigantic plant, which is located at the intake basin, uses 24 variable speed pumps with a total capacity of 288 MW (24x12 MW) and a total discharge of 350 m³/s (21x16.7 m³/s).

Project development and execution were headed by the Ministry of Public and Water Resources, Egypt. As subcontractor for electrical works, ABB delivered a complete solution, including equipment (220 kV substation, medium and low-voltage switchgears, busducts, variable speed drives, and transformers) as well as engineering, installation and commissioning services.

From Challenge to Projects



Singapore: PUB's Changi Water Reclamation Plant

Singapore's national water agency, PUB's Changi Water Reclamation Plant is the cornerstone of the first phase of the Deep Tunnel Sewerage System project. The Deep Tunnel Sewerage System is an efficient and cost-effective solution to meet Singapore's long-term needs for used water collection, treatment and disposal. The first phase of the project features a state-of-the-art, compact and covered used water treatment plant designed to handle 800.000 m³/day of used water per day, expandable to an ultimate 2.400.000 m³/day. The plant will provide a high standard of treatment to used water before it is discharged through the deep sea outfalls.

ABB was selected for the complete range of high quality products as well as our ability to deliver the equipment as turnkey solution, coupled with a strong local service and support team, which is our key differentiating factor. The complete portfolio meant one single contact point, quicker response time and more efficient service, essential for a project so critical for the future of Singapore.

Both the influent and the effluent pumping stations have ABB medium voltage motors and drives, providing energy efficiency and reliable power to the connected pumps. Power is supplied via two ABB 66kV high voltage switchgears with full redundancy. Various ABB medium voltage and low voltage systems, including transformers, distribute power to the plant equipment, such as ABB instrumentation which monitor key process parameters.

Istanbul: Melen and Cumhuriyet pumping stations

The main aim of the Melen Project is to secure drinking water supply of the 15 million population city of Istanbul up to the year 2040. River water from Melen near the Black Sea is pumped 200 km via a pipeline and two pumping stations at a rate of max.

720.000 m³/day into the water treatment plant in Cumhuriyet. Treated water is then pumped through an undersea tunnel below the Straits of Bosphorus to Istanbul. ABB was part of a consortium, which is responsible for civil, mechanical and electrical works (turnkey) of the two pumping stations. The client is the Directorate of State Hydraulic Works (DSI), Ankara Turkey. ABB solution, for both Melen and Cumhuriyet pumping stations, includes equipment (Centrifugal Pumps, Medium Voltage Motors, Power Factor Correction System, DC and UPS System, Distribution Transformers, MV and LV Switchgears, Instrumentation and Control System, Ventilation System, Surge Vessels, Weir and Header Tank) as well as engineering, installation and commissioning services.

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