Challenge & GE Value

With a global population growing by around 75 million every year, water is essential for sustaining life. A rise in food needs, rapid industrialization and climate change all add up to ever-increasing pressure on global water resources. Emphasis is needed on conservation, quality and more efficient ways to make water readily available.

Transforming salt water into fresh water through desalination, providing access to distant freshwater resources via upgraded water transportation and treating low-quality wastewater to turn it into drinking water are all viable solutions. However, they have one thing in common: they require energy.

Optimizing these processes and seeking out the most efficient solutions are among the key challenges.

Cost-Effective and Flexible Operation for Water Equipment Supply

Energy Efficient

Our leading technology motors plus MV and LV drives combined with automation and controls provide:
- Reliable and proven products and components
- System engineering to meet customer specifications
- System solutions that include additional electrical balance of plant products
- Possible equipment installation services

Outage Excellence

Electrical System Optimization for Planned Outages

To manage timing, execution and performance of service for critical pumping assets, we provide customized support, upgrades and life extensions for water pumping systems:
- Focusing on component level up to the broader electrical system
- Increasing performance of pump systems and overall plant efficiency
- Providing maintenance, upgrade or replacement of GE and other OEM equipment

Asset Performance Management

Productivity Solutions that Minimize Unplanned Downtime

For our motors and drives we offer digital solutions enabling:
- Equipment insights to ‘see’ failures before they occur
- Correct information at the right time to enable optimization of maintenance costs
- Process-based analytics at plant level, optimizing asset performance
- Outcome-based service agreements
Water Solutions

Fully Integrated Electric Solutions to Help Improve Efficiency

A growing global population, rising food needs, rapid industrialization and climate change are applying pressure to global water resources. Collectively, we need to focus on conservation, quality and new ways of making water more available.

Water desalination, used water treatment and more efficient transportation are all technologies that decrease production costs, in particular by optimizing energy consumption, improving operational efficiency and limiting maintenance needs.

GE offers the water industry complete electrification packages for pumping systems. The value lies in our ability to meet the exact requirements of industrial users through power system studies. These can determine expected levels of voltage flicker, power factor, harmonic distortion and bus-bar voltage stability.

With over 1,000 field service engineers and a presence in more than 170 countries, GE operates as a global and local partner for motors, drives and electrification systems. This allows us to operate wherever and whenever you need us.

An Offering Tailored To Your Needs

Desalination

The most energy-efficient way of producing fresh water is to desalinate sea and brackish water using the reverse osmosis process.

GE’s customized solutions are designed to improve the efficiency of your processes, increasing their reliability and availability.

We offer a wide range of solutions including products and systems.

GE’s expertise in the power conversion field allows us to provide advanced technology to solve electrical and automation issues.

Water transportation

Water transportation encompasses pipelines carrying water over hundreds and even thousands of kilometers. Medium- and high-power systems are essential to transport large quantities over such long distances.

GE has many years of expertise in MV drive trains, providing customers with solutions that address key needs such as:

• Water process control, leakage detection and pipe integrity
• Improving the pipeline’s lifetime
• Preventing the ‘water hammer’ pressure surge effect, allowing a reduction in the sizing of mechanical parts
• Increasing availability in case of grid fault
• Raising efficiency across the transport velocity range

GE’s wide range of solutions and technical expertise allows us to help customers choose the best technical solution. This combines reliability, availability and efficiency, and meets grid quality requirements.

Wastewater and sludge treatment, drinking water treatment and distribution

Wastewater, sludge and drinking water treatment – and its distribution – require a wide variety of drive train systems and automation solutions. GE addresses these market needs with a full range of converters and motors (both low-voltage and medium-voltage), and by designing solutions for the supervision, automation and control of the water processes.

GE supports its water customers with solutions that provide high efficiency in any flow range – as well as improving availability in case of grid fault.

Water Product Portfolio

Variable-Frequency Drives

Delivering high power density, reliability, availability and scalability.

Models
• MV6 Series
• MV7 Series
• LV drives

Technical Capabilities
• Output power: 0.5 to 18 MW
• Output voltage: Up to 13.8 kV
• Output frequency: Up to 300 Hz
• Input frequency: 50 or 60 Hz +/-5%
• Variable-speed systems for main, major and auxiliary drives
• HV/LV power supply
• Air- or liquid-cooled

Motors

Reliable and efficient motor technology for water processes.

Models
• Induction motors
• Synchronous motors

Technical Capabilities
• Power: 0.5 to 40 MW
• Voltage: Up to 13.8 kV

Automation and Control

The controls across our automation and drive systems platform are built using a suite of reliable and secure automation components. We then assemble them into modular, flexible and scalable automation solutions.

Models
• Controllers, I/O, Motion
• HMI/SCADA
• Leakage detection and pipe integrity
• Process and production management and optimization
Key References

**Victorian Desalination Project, Victoria, Australia**

Australia’s largest seawater desalination plant with reverse osmosis technology capable of 450,000 m³/d.

**Scope of Supply**
- Variable-Speed Drive Systems (VSDS) using Diode Front End (DFE) technology architecture for:
  - 27 first-pass high-pressure pumps
  - Six transfer pumps
  - Three booster pumps
  - Low-voltage high-power converters
  - Low-voltage harmonic passive filters

**Benefits**
- 30% CAPEX savings
- +1.5% energy efficiency
- Improved reliability (reduced number of active components)

**Strategic Tunnel Enhancement Programme (Step), Abu Dhabi, Uae**

World’s largest wastewater treatment plant with 45 km of underground pipelines capable of 1,300,000 m³/day.

**Scope of Supply**
- Eight 6.38 MW pump drive trains (motors, VSD and transformers) running at 500 rpm plus pump process automation
- Very strong collaboration with the EPC and the pump OEM to define the optimum solution, applying state-of-the-art hydro technology
- Full simulation of electrical architecture to ensure a perfect fit with power grid requirements

**Benefits**
- Increased energy efficiency
- Reduced maintenance
- Controlled plant water flow

**Water Security Mega Reservoirs Project, Qatar**

Five potable water mega reservoir sites (including reservoirs and pumping stations) with initial storage capacity of about 2,300 million gallons of water with 480 km of buried ductile iron pipelines with a diameter up to 1.6 m.

**Scope of Supply**
- Variable-Speed Drive Systems (VSDS) for booster pumps:
  - Four 0.35 MW low-voltage VSDS
  - Nine 2.3 MW medium-voltage VSDS

**Benefits**
- Increased energy efficiency
- Reduced maintenance
- Controlled plant water flow
For more information on GE Power Conversion’s Water Solutions, please contact your local sales representative.

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