

### Project Summary

GE Energy was awarded a contract by Harbin Electric Machinery Co., Ltd. of Harbin, China, to provide 12 sets of turbine governors for the Three Gorges Right Bank Power Station. Located in Yichang City, China, Three Gorges Project is the largest hydropower project in the world.

Backed by GE Energy's industry-leading capabilities, the comprehensive hydro controls solution will deliver increased water usage efficiency – through improved water levels – and improved grid stability – through increased turbine availability – to the customer, far surpassing the solutions offered by Alstom, the leading competitor in this space.

GE Energy will provide a comprehensive hydro controls solution, combining digital governors, FC\*20000 flow control valves and installation, commissioning, and start-up services. GE Energy's solution combines the MicroNet™ digital governor with proprietary hydro controls algorithms to create a customized controller with triplex redundancy. Capable of delivering up to 23,700 liters/minute at 1,100 psi, the FC20000 valve was designed specifically for the Three Gorges project.

"As the largest in the world, Three Gorges is the industry flagship hydro plant," says Ric Artigas, president of Energy Services. "GE Energy's advanced control solution continues to demonstrate our long-term commitment to the Chinese power market, as well as aid Three Gorges to efficiently meet its energy demands."

### Customer Benefits

In the Three Gorges Project, Harbin Electric Machinery Co., Ltd. sought a single controls provider that could help them reliably generate hydroelectric power using their 12 multi-OEM Francis turbines. Harbin also needed competitive pricing and a solutions provider with the solid history, proven technology and expertise that only GE Energy could provide. By combining the FC20000 and a fully digital control system, GE was able to provide a custom-designed control solution, resulting in the following benefits to the customer:

### Project Benefits

- Greater operational efficiency by ensuring that the correct amount of water flows through the turbine
- Enhanced operating revenue through decreased maintenance costs – the FC20000 is nearly leak proof
- Improved turbine availability
- Minimized downtime and simplified maintenance enabled by solid, modular design
- Sustained ability to meet energy demands
- One-stop resource for total controls solution



Three Gorges Dam, China

# project overview

## About the Three Gorges Project

Launched in 1993, the Three Gorges Project is being built on the middle reaches of China's longest waterway, the Yangtze River. When it is completed in 2009, the Three Gorges Project will consist of 26 generators with a combined energy generation capacity of 18,200 megawatts and will be able to generate 84.7 billion kWh of electric power annually. This project is one of multiple contracts that GE Energy has recently won in conjunction with China's Gas Turbine Power Plants Construction Project.



Three Gorges Dam, China

## Why Harbin Electric Machinery Chose GE – How to Grow a Global Opportunity

The GE team knew that the caliber and scope of this project required significant teamwork and engineering support. "The technology in the FC20000 was a key contributor to GE winning this contract," said Bill Geisler, Product Line Manager, Hydro Controls. "We worked with Harbin to identify their CTQs and designed and built this valve specifically for Three Gorges." The Account Team comprised of key individuals from GE Energy, who have been working with Harbin since the project commenced in 1993.

Customer segments that are candidates for both new and retrofit flow control valves include:

- Power generators with multi-OEM Francis turbines;
- Plants with the desire to reduce operating costs by increasing the efficiency of water use; and
- Operators that require turbine performance improvements with a precise flow control valve, like the FC20000.

## GE Energy Control Solutions

GE Energy's Control Solutions are custom-designed solutions for turbine generator and compressor controls, as well as plant-wide systems. Optimizing performance for turbines from a variety of equipment manufacturers, GE's solutions are focused on enhancing our customers' operating revenue and providing tangible bottom-line benefits.



For complete product specifications and ordering information:  
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\* FC is a trademark of the General Electric Company.  
MicroNet is a trademark of the Woodward Governor Company.

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