



## Single-Source System Provider

Water-to-Wire, Turbine-Valve-Controls Integration,  
Motion & Control Engineered Systems

### Sorensen Provides Station Automation, Governor Conversion & Turbine Rebuild

When the Massachusetts Water Resources Authority (MWRA) determined that turbine generators at its Clinton MA location along the Wachusett Reservoir needed upgrading and refurbishment, Sorensen Systems was awarded the contract for the project. The two vertically oriented, full Kaplan type 1,600 KW generators with six adjustable runner blades and two 2,240 HP turbines had been in operation since 1969. The upgrade was necessary to integrate the turbine operation with newly configured water supply system.

The hydroelectric facility, locally referred to as the Cosgrove Intake, regulates the flow of water from the Wachusett Reservoir into the Cosgrove Aqueduct, which is an important transmission leg in the supply of water to the Boston Metropolitan area. There are two sections, the North and South intakes, and both intakes include a hydraulic turbine and two bypass lines. Each intake has three channels with traveling water screens. Each intake also has an upper intake sluice gate and lower intake sluice gate that allow operational flexibility to draw water from different levels of the reservoir.

#### Hydroelectric Refurbishment

Sorensen Systems provided the design, manufacturing, installation supervision, commissioning and training for the entire project, which included the disassembly and refurbishment of the existing turbine generators, new static excitation systems, new turbine bearing cooling water systems, refurbished switchgear panels, new digital governor heads with the refurbished governor hydraulic pumping units and new station battery charging system.

Sorensen Systems has over 50 years experience with new installations, refurbishment projects and station automation for the hydroelectric, power generation, water and waste-water industries. It has established a reputation as a leader in the design and manufacture of electro-hydraulic governors, gate-operating systems, and hydraulic lubrication and bearing cooling units.

#### Sorensen Systems Design/Build

Its in-house staff of engineers and design technicians have extensive experience with applications ranging from turbine speed control to water level management. System design, fabrication, installation, start-up and field maintenance are provided for:

- High and low pressure electro-hydraulic conversion systems
- Remote gate positioning systems
- Ball valve, butterfly valve and fixed cone operating assemblies and systems
- Turbine lubrication and cooling systems
- Crest, slide and roller gate control systems
- Gas/steam turbine combined cycle diverter systems
- Electro-hydraulic governor control systems

#### Full Service Project Engineering

From its 60,000 square foot engineering and manufacturing headquarters in Massachusetts, Sorensen Systems works closely with its customers and with any globally recognized hydraulic and electrical component manufacturer to provide full service project engineering from initial concept through commissioning. Its team of mechanical,

electrical, hydraulic, electro-mechanical, and pneumatic engineers, support customers in the following ways:

- We provide complete design documentation
- We follow a compressed turn-around design-to-production schedule
- We offer worldwide field assistance for on-site engineering of special applications reducing installation and commissioning costs
- We offer customized testing procedures at our facility allowing the customer to put their equipment to work sooner



Sorensen Systems upgraded and refurbished the two 1.6 MW generators at the MWRA Cosgrove Intake facility in Massachusetts.



Sorensen Systems built two new digital excitation control systems as part of refurbishment.

ISO 9001 Certified  
UL 508A Panel Shop

#### Sorensen Systems

70 Bearfoot Road  
Northborough, MA 01532

Tel: 508-393-7660  
Fax: 508-393-6042  
[www.SorensenSystems.com](http://www.SorensenSystems.com)