



Eaton Electrical Services & Systems offers a full-range of solutions to the hydroelectric industry



Example of a repowered small hydro using front-access medium voltage switchgear before and after.

North America's hydroelectric plants are aging and reaching the end of their lifecycle. However, the growing population and governmental regulations, not to mention the cost and time factor for building new to meet green electrical demand, makes modernization of these plants imperative.

Modernization can consist of several approaches including upgrading equipment and control and automation systems. Eaton® offers decades of experience working with large and small hydroelectric systems to bring them into the twenty-first century and beyond.

We offer exceptional, highly-customized turnkey project management along with our product life extension program, and automation solutions to improve the efficiency, reliability and safety of your hydroelectric plant.

Design/Build Solutions

Modernization and automation projects can be complicated—with many vendors to manage, deadlines to meet and details to oversee. Often, projects extend past planned timeframes and budgets because of the difficulties in maintaining control of the operations.

With the expense and coordination that goes along with large-scale projects, it makes sense to

have a dedicated, experienced project management team to ensure the project is managed properly to meet deadlines and budget requirements.

Eaton Electrical Services and Systems' Project Operations Group offers full turnkey services to the hydroelectric industry. Our expert engineers take your project from conception to completion, following rigorous execution and management processes. With our turnkey services, you'll have a single point of accountability and a reduced risk of project delays and failures. The result is a safer, more reliable and cost-efficient power system.

- Switchgear upgrade – 480V thru 345kV class
- Generator breaker upgrades up to 6000A and up to 15kV with new Eaton breakers
- Exciter replacement and/or modernization
- Complete generator control system modernization – PLC & HMI
- High resistance grounding
- Demolition and site renovation
- Substation yard upgrades
- Civil, mechanical and electrical design services
- Startup and commissioning services



Powering Business Worldwide

Life Extension Program

Eaton provides a comprehensive offering of life extension, modernization and upgrade solutions for the hydroelectric industry installed base of electrical distribution and control equipment. Our solutions include upgrading to the most current control and circuit protection technology and extending the life of existing equipment with genuine renewal parts, replacement components, factory remanufacture and repair, and other services. Eaton is a leader in supporting the installed base of other manufacturers' equipment, as well as those original manufacturers no longer in business.

Low Voltage Air Replacement Breaker

- Cost effective alternative to new switchgear
- Reduces downtime with minimal switchgear cell modifications
- Upgrades using current breaker technology
- Available with Arcflash Reduction Maintenance Switch technology
- Designed and tested to IEEE/ANSI standards

Medium Voltage Vacuum Replacement Breaker

- Vacuum replacement for outdated technologies
- Uses Eaton's VCP-W Vacuum Breaker technology
- Available with patented SURE CLOSE Technology
- Over 200 designs currently available for most ANSI manufacturers

Automation Systems

Our experienced automation engineers will work with you to implement the automation systems required to operate your plant reliability, safely and efficiently. Our solutions assist you to control, monitor and manage your plant to extend equipment life.

- Gate control systems and automation
- Unit automation
- Station automation
- Water level management, river control systems
- Instrumentation upgrades/design
- Remote control and monitoring (SCADA)
- Fire and security systems
- Equipment condition monitoring (temp, vibration, partial discharge)



About Eaton Electrical Services and Systems

Eaton is one of the largest and most experienced industrial service organizations in North America. With over 700 highly trained professionals in engineering services locations throughout the US and Canada, we have complete local, national, and international capabilities to provide a full range of electrical and mechanical equipment services. This broad range of service capabilities has established us as the leader in the engineering and service industry.

Eaton provides a unique capability when you are faced with a major capital project or expansion of your hydroelectric power system. Our organization is staffed with technical and professional experts on power systems. This provides a vast resource from which to draw on in staffing your complete project. Years of experience as an electrical equipment manufacturer and engineering service provider in industrial plant environments uniquely qualifies Eaton to handle a wide range of major projects where it is imperative to provide an efficient cost-effective installation while meeting or exceeding your requirements.

Oftentimes, Eaton's unique and forward-thinking solutions exceed the output requirements specified by our customers. We have in-depth experience in the design and upgrade of various hydroelectric systems, the operation of various generation plants and transmission and distribution substations.

For more information visit www.eaton.com/EESS

Eaton Corporation
Electrical Sector
1111 Superior Avenue
Cleveland, OH 44114 USA
Eaton.com

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