

## Electrical Engineering Services & Solutions for Utilities

Line card—transmission, substation and distribution offerings

# Optimizing utility power systems to align with goals

Eaton helps utilities design, build and maintain a safer, automated, secure and cost-effective grid.

- Investor-owned
- Municipal
- Cooperative
- Transmission
- Independent power producers

## Energizing a world that demands more

Eaton brings new dimensions of expertise to help utilities improve reliability, drive operational efficiencies and reduce costs. Utilities rely on Eaton to assist them in protecting people and assets, processes and the environment with products and solutions that can enhance every aspect of their business; from safety to reliability. Eaton is helping utilities design, build and maintain a safer, automated, secure and cost-effective grid. Eaton delivers support in the wake of extreme weather conditions, aging infrastructure, workforce changes and stakeholder expectations, all while managing power, complying with local and federal government regulations and emissions standards, and providing solutions that help utilities make smart capital investments for the future.

Eaton's service team is one of the largest and most experienced teams of power system engineers in the industry, with industry-standard software and advanced modeling and analysis capabilities at their fingertips. Their comprehensive portfolio of design services includes safety studies and energy management, power quality and reliability audits. Eaton's extensive services offerings combine a geographically dispersed field organization to support testing, troubleshooting, maintenance and emergency needs with a dedicated turnkey projects organization to solve the most difficult power management problems.

Eaton understands your business requirements and sets strategies for your power system. With Eaton's help, you'll witness a range of business benefits, from reduced costs to a more effective use of assets. Our engineering and consulting services help you manage your power system as a strategic resource, providing cost-effective solutions to increase safety, reliability and efficiency.

# EATON

*Powering Business Worldwide*

Contact your Eaton sales representative or call Eaton Care for more information on Eaton's Electrical Engineering Services & Systems' offerings  
PH: (877) ETN-CARE  
trc@eaton.com

Locate an Eaton services office  
Eaton.com/service



## DESIGN

Eaton provides you with expert engineering support to ensure a proper and safe design

Engineering and consulting services focus on understanding your requirements and setting strategies for your power system in order to satisfy your business needs.

### System design and monitoring

- New substation design and construction
- RTU configuration, programming, commissioning and testing
- Greenfield and existing RTU replacement
- Substation ground grid design
- Protection and control design
- Distribution system design
- Dynamic simulation
- Training
- Generator, transmission and distribution system design
- Energy storage
- IED configuration
- SCADA design and implementation
- Commissioning and configuration of self-healing grid and volt-VAR optimization systems
- Microgrid design, engineering and turnkey installation
- Alternative power generation design, engineering and grid integration
- Monitoring solutions: power quality and energy management
- Motor control center systems integration to parent system
- Control systems / power systems automation
- Programmable logic controller (PLC) automatic transfer schemes

### Power system studies and analysis

- Load flow analysis / power factor correction studies
- Motor starting studies
- Advanced design and analysis
- Switching transient analysis
- Distribution systems reliability analysis
- Disturbance monitoring
- Harmonic analysis
- Effective grounding
- Power quality site surveys
- Energy management
- Power system design

### Safety and reliability studies

- Short circuit
- Protective device evaluation
- Protective device coordination
- Power system investigations
- Grounding
- Arc flash
- Power system audit
- Troubleshooting

## BUILD

Eaton provides cost-effective, on-time system improvements with a single point of contact

Modernization and turnkey power system services deploy personnel in the field to complete projects, whether upgrading an existing installation or building a brand new facility.

### Turnkey services

- Modular integrated transportable substation (MITS)—a turnkey engineering substation solution
- Complete turnkey substation expansion and refurbishment
- Remote terminal unit turnkey replacement services
- Turnkey substation capacitor bank design, installation and commissioning
- Construction services including site, civil, electrical and structural
- Standardized documentation practices including scheduling, reporting and project closeout
- Installation services including subcontracting capability of all trades with on-site project management
- Turnkey hydroelectric solutions
- Turnkey synchronous condenser projects
- Mobile apparatus including substations, voltage regulators and switchgear
- Multi-vendor equipment supply chain
- Supply of the complete range of Eaton products
- Coordination and purchase of all third-party customer-preferred components
- Prefabricated control house
- Modular collector substation
- Utility grid management and monitoring systems
- Demand management

Eaton can maximize your uptime, reliability and safety with ongoing services

**Contract and support services provide the maintenance, parts and service needed to get the best performance from your existing power systems.**

### Startup and commissioning

- Acceptance testing and installation certification
- Ground fault certifications
- Interconnect confirmation and commissioning
- Warranty extension
- Installation support and supervision
- Startup and training
- Ground grid testing

### Preventive and predictive maintenance

- Maintenance program design and implementation
- Periodic testing and maintenance services
- Thermographic surveys
- Troubleshooting/testing
- DC power systems
- Ultrasonic partial discharge detection
- Transformer oil processing
- Battery/cell testing
- Generator load bank testing
- Transformer/breaker oil testing
- Contact alignment

### Maintenance and emergency services

- Complete scope of testing, repair and evaluation
- Short-/long-term maintenance contracts
- Crisis response personnel dispatch

### Direct results tests

- Insulation resistance
- Contact resistance
- Turn ratio testing
- Primary injection testing
- Secondary injection testing
- Dielectric withstand test—hi-pot (destructive)
- Breaker injection testing
- Protective relay testing and calibration
- Power factor
- Ground grid testing
- Transformer/breaker oil test and breaker time/travel test

### Electrical equipment life extension and modernization

- Class 1 breaker reconditioning LV and MV
- LV air replacement breakers
- MV vacuum replacement breakers
- LV-VSR (breaker to motor starter replacements)
- MV-VSR
- Upgrade equipment front door metering and relaying
- RPR-2 remote power racking systems

### OEM equipment services and upgrades

- Westinghouse®/Cutler-Hammer®/Eaton/Cooper®
- Square D®
- General Electric®
- ITE®/ABB®
- Allis-Chalmers/Siemens®
- Federal Pacific®/Federal Pioneer®

**Emergency response line**  
PH: (800) 498-2678

**For more information on Eaton's utility offerings, visit [Eaton.com/utility](http://Eaton.com/utility)**





## About Eaton's Electrical Engineering Services & Systems

Eaton's Electrical Engineering Services & Systems is one of the largest and most experienced industrial service organizations in North America. With more than 1500 highly trained professionals in 60 engineering service locations throughout the U.S. and Canada, Eaton's Electrical Engineering Services & Systems has complete local, national and international capabilities to provide a full range of electrical, civil and mechanical equipment services. This broad range of service capabilities has established us as a leader in the engineering service industry.

For more information, visit  
[Eaton.com/service](http://Eaton.com/service) or [Eaton.com/utility](http://Eaton.com/utility)

**Eaton**  
1000 Eaton Boulevard  
Cleveland, OH 44122  
United States  
[Eaton.com](http://Eaton.com)

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