

## Commissioning and Startup

- Equipment installation
- Acceptance testing and calibration
- Full life cycle commissioning
- LEED commissioning
- Commissioning plan development
- Project management
- Performance baselining
- Integrated systems testing
- Code compliance evaluation
- Personnel training

## Electrical Maintenance Services

- Maintenance planning and program development
- Turnaround and outage support
- Preventive maintenance
- Periodic inspection, cleaning and lubrication
- Equipment calibration
- Emergency response and recovery services
- Electrical system troubleshooting and repair
- Transformer vacuum filling
- Insulation oil filtration

## Electrical Testing Services

- Standby and emergency system testing
- High potential testing
- Cable fault location
- Ground fault testing
- Ground resistance testing
- Breaker time travel analysis
- Power quality/line disturbance analysis
- Battery testing
- Voltage/load recording
- Load bank testing
- Magnetic field (EMF) testing and mitigation
- Contact resistance testing

- Insulation resistance testing
- Insulation power factor testing
- Motor surge comparison testing
- Transformer turns ratio testing
- Winding resistance testing
- Frequency response analysis
- VLF testing

## Online Predictive Diagnostics

- Equipment inspection
- Infrared/thermography
- Partial discharge testing and monitoring solutions
- Ultrasonics
- Oil analysis

## Engineering Services

- Short circuit and coordination studies
- Arc flash solutions
- Single-line diagram development
- Power quality studies
- Harmonic analysis
- Transient stability studies
- Load flow analysis
- Power factor studies
- Grounding studies
- Voltage imbalance/regulation studies
- Power system reliability studies
- Reliability centered maintenance studies (RCM)

## Power System Protection Services

- Power system studies
- System logic and control settings
- Protective system functional testing
- End-to-end testing
- Relay maintenance and calibration
- Relay design/integration

- Fault analysis/troubleshooting
- NERC compliance services
- Turnkey relay retrofits, upgrades, and replacements

## Life-Extension Services

- Modernization of outdated and under-rated equipment
  - 480v circuit breaker retrofits
  - 2400v to 15000v circuit breaker upgrades (vacuum, SF6)
  - Fused switches
  - Static exciter retrofit
  - High pressure switches, starters/contactors, motor control center
  - Automatic transfer switches
- Battery replacements
- Direct replacement breakers
- Circuit breaker repair
- Transformer repair/replacement (tap changers, gaskets, bushings, leaks)
- Replacement parts
- Emergency services

## Educational Services

- Performance solutions
  - Skill and training needs assessment
  - Personnel safety
  - Policy and procedures
  - Regulatory compliance
  - New equipment training
  - Maintenance practices
- On-site and classroom courses
- Computer-based and self-paced learning
- Certification to recognized industry standards

### Ordering Information

To learn more about these services and other Vertiv™ solutions, please contact your local Electrical Reliability Services sales representative office or visit [VertivCo.com](http://VertivCo.com). In the U.S., call (877) 468-6384.