Who do you turn to for substation solutions up to 345 kV?

Complete Substation Services and Solutions from Schneider Electric

Make the most of your energy
Setting the industry standard ...

... for quality and reliability, Schneider Electric™ serves utilities and large power users with superior products and services for their outdoor substations.

Products supported include:

- Bushings
- Circuit Breakers: Oil/SF₆/Vacuum
- Circuit Switchers
- Control Systems
- Isolated-Phase Bus
- Power Switches
- Relays: Electromechanical and Electronic — all brands and types
- Switchgear: Gas-Insulated
- Transformers: PTs/CTs
- Transformers: GSU/Power/Auxiliary — to 600 MVA

Any brand. Any industry. Any time.
Schneider Electric Services
Your trusted single point of contact for all of your substation needs

Ranging from small jobs to turnkey design and build contracts, our broad range of capabilities includes:

- Engineering, Procurement, and Construction
- Maintenance, Repair, and Upgrade
- Power Transformer Services
- Instrument Transformer Services
- Substation Equipment
Engineering, Procurement, and Construction

For all aspects of your substation construction, upgrade, and/or expansion projects, up to 345 kV

Services include construction means, methods, techniques, sequences, procedures, and programs such as temporary utilities or facilities, fencing, signs, scaffolding, barricades, and project cleanup.

Engineering Services

Combining our design services with engineering analysis provides our utility and large industrial customers with a complete engineered solution. Projects can be customized from basic design consultation to feasibility studies to a complete turnkey solution. Our substation services include:

- Substation layout, elevation drawings, and oil containment
- Design services
  » Civil and structural design
  » Protection and control system design
  » Control house design
  » Conduit and trench design
  » Grounding system design
- Equipment sizing and specification
- Power system analytical studies
  » Overcurrent coordination
  » Time-current coordination analysis
  » Arc flash analysis
  » Motor starting analysis
  » Ground-grid analysis
  » Stability studies
- Power factor correction and harmonic filter design

Installation Services

As part of our turnkey solution, Schneider Electric Services provides the necessary labor, equipment, and supervision for a streamlined project.

- Transmission towers and substation bus
- Steel structures
- Transmission breakers and switches
- Transformers
  » Haul and install/dress out/hot oil fill
- Isolated-phase bus
- Switchgear and distribution breaker instrumentation
  » Category 5/fiber/multiconductor cabling
- SF6 equipment
- Grounding systems
  » Ground grids/detection/relaying
- UPS and battery systems
- Control and substation automation
- Duct banks and cabling
  » MV and HV cables

Utility Coordination

This critical function coordinates the requirements between a variety of project participants such as electric utilities, co-ops, and municipalities.

Civil Work

These services include surveying, right-of-way development and clearing, foundations, piers, placing transmission tower foundations, drainage, roadway work, ground grids, and guy wires.

Procurement and Project Management

Our offer includes developing specifications, releasing requests for quote for major equipment purchases, evaluating bids, ordering equipment, and providing complete project management services.

Solar Power Systems

Schneider Electric also offers a variety of solar project solutions including: solar power conversion substations, photovoltaic box (PV box), design and build of grid-tie substations, and complete turnkey capabilities.
Maintenance, Repair, and Upgrade Services

Solutions to help reduce outages, lower costs, increase energy efficiency, and extend equipment life

> Predictive Maintenance
  - Infrared thermography and continuous thermal monitoring
  - Corona camera with continuous partial discharge monitoring
  - Acoustic surveys, vibration analysis, and scheduled inspections
  - Samples and analysis: oil and SF₆

> Preventive/Corrective Maintenance
  - Regularly scheduled maintenance, shutdowns, inspection programs, and multiyear contracts
  - Protective relaying and calibration services
    - Available on all types: electromechanical, solid state, and microprocessor based
  - Transformer oil purification
  - Substation yard maintenance
  - Busway repair: feeder, non-segregated
  - Air switch repairs

> Disaster Recovery
  - Flood damage assessment and repair
    - Trained specialists in water-damaged systems will assess equipment and advise options to repair, recondition, or replace
  - Supply and install replacement equipment
  - Provide temporary power
    - Generator rentals and hookup

> SF₆ Gas Management Program
  - Covers the life cycle of SF₆-filled switchgear or equipment, from installation to disposal
    - Supply SF₆ gas
    - Documentation and inventory control

> Upgrade Solutions
  - Switchgear modernization
    - Magnum™ replacement MV circuit breakers
    - Retrofit cells to accept modern circuit breakers
    - Replace SF₆ equipment
    - CT/PT replacement
    - Add new vertical sections
    - Replace old or damaged wiring
  - Protective relays
    - Rewire cubicles for new relaying
    - Install new cut-outs and cubicle fronts
    - Point-to-point wiring and loop checks
    - Add new wiring for communications
    - Connect relays into DCS or SCADA
  - Grounding systems
    - Ground grids
    - Ground detection packages
    - Ground fault protection relaying
  - Oil circuit breakers
    - Install/replace/relocate/reconnect
    - Replace with SF₆ or vacuum circuit breakers
  - Bus work additions or modifications
  - Cables (MV and HV)
    - Install new or replacement cables in conduit, cable tray, or overhead

Having a preventive maintenance program in place can reduce the risk of unplanned downtime by as much as 66%.*

*Source: IEEE

> Turnarounds and Shutdowns
  - Provide/install temporary lighting and power
  - Extensive turnaround experience; ability to mobilize crews from 1-50+ field service representatives
Power Transformer Services

Proven service solutions to promote reliability and extend transformer life

> Assemblies
- Mount header banks, radiators and bracing, bushings/bushing housings, pumps, conservators, gas relays, and N2 systems
- Inspect and verify tap changer operation and position

> Testing and Condition Assessment
- Factory acceptance and troubleshooting testing: includes insulation power factor, turns ratio, winding excitation, insulation resistance, winding resistance, sweep frequency analysis, leakage reactance, CT saturation and ratio, alarm functional checks, electronic thermal monitor programming, and dissolved gas analysis
- Perform predictive maintenance
  » Check fluid levels, oil sampling and analysis, N2 pressure, temperature readings, and visual inspections
  » Infrared thermography, ultrasound transformers and pumps
- Trending of test data
- Load tap changer inspection, testing, and component replacement

> Hot Oil Processing
- Oil purification: includes dehydration, degasification, thermal cleaning, and removal of particulates and contaminants
- Dissolved moisture (ASTM-D1533) reduced from 100 ppm to < 10 ppm in single pass and < 3 ppm in three passes
- Dissolved gas (ASTM-D2945) reduced from 10% to < .25% in single pass and < .15% in three passes
- Equipment utilized
  » 1,800 GPH inlet and discharge pumps
  » 170 CFM piston backing vacuum pump
  » 1,450 variable speed rotary booster vacuum pump
  » 5 micron prefilter with 0.5 micron particulate polishing filter
  » In-line moisture monitoring system
  » Vacuum degassing chamber with secondary dispersal system
  » Processing rigs include Stokes brand and SESCO

> Repair Services
- Transformer gasket replacement
- Bushing gasket repairs and change-outs
- Bushing and lightning arrester replacement
- Welding repairs
- Pump repair and replacement
- Radiator and cooler replacement or gasket repair
- Replace and repair cooling fans
- LTC maintenance and retrofits
- Filtration installations
- Thermal upgrades to increase cooling capacity
- Customer-specific modifications/engineering
Instrument Transformer Services

Testing services to minimize billing inaccuracies between new, high-accuracy meters and existing equipment

> Current/Potential Transformer Verification (CT/PT)
  - Current transformer verification (CTV) dynamically verifies the accuracy of existing installed current transformers or the full CT measurement channel
    » Performed as a service on an energized system with no need for outage or on de-energized CT (primary injection)
    » Findings can be used for compliance documentation or for correction and/or upgrade

> Current Transformer Reclassification (CTR)
  - Dynamically reclassifies existing relay-class CTs for metering applications
  - Eliminates the need for costly CT upgrades for new metering points

> Accuracy Improvement of Metering Systems (AIMS)
  - Dynamically verifies and improves the accuracy of existing revenue metering points
  - Results are an industry-compliant metering solution with the highest possible end-to-end metering

Industry-Leading Substation Equipment

- **VOX Outdoor Dead Tank Circuit Breaker** — With ratings up to 38 kV/2,000 A/40 kA, VOX dead tank circuit breakers perform well in harsh ambient conditions and require limited maintenance. They feature a small footprint and easy-to-access construction.

- **Powersub™ Vacuum Circuit Breaker Type FVR** — These industry-standard outdoor distribution circuit breakers feature arc-resistant enclosures. In addition, Powersub medium-voltage circuit breakers are durable, flexible, and easy to maintain.

- **Metal-Clad Switchgear** — This equipment protects transformers, motors, generators, distribution lines, and feeder circuits. Masterclad™ switchgear is available in voltages from 4.76 kV to 27 kV and current ranges from 1,200 A to 3,000 A. For most ratings, one basic size unit is used. Other solutions available up to 38 kV.

- **Walk-In Enclosures** — Developed for the protection of equipment in outdoor or adverse environments, the custom design allows virtually any size layout or configuration. They are typically built and shipped in one module requiring no assembly at the job site.
Why Choose Schneider Electric Services?

As part of Schneider Electric, the global specialist in energy management, you can count on Schneider Electric Services to help manage the life cycle of your equipment.

We will be there to support you now and in the years to come, from start-up and commissioning, to training, to preventive maintenance and testing, to upgrade and modernization solutions.

With a nationwide team of professional engineers and qualified field service representatives, we are committed to providing you with innovative solutions, best-in-class customer service, advanced technical support, and exceptional quality in everything we do!

- Our professional engineers are strategically located throughout the U.S. and collectively registered in every state.
- Our field service representatives are qualified, as defined by OSHA and NFPA 70E®.
- Our culture of safety helps mitigate your risks.
  » Our North American Operating Division is the only company to simultaneously hold the Robert W. Campbell Award (2009) and the Green Cross Award (2011).
  » Schneider Electric Services has been awarded 15 Operational Excellence Awards, 8 Perfect Record Awards, and a Superior Record Award by the National Safety Council.

Any brand. Any industry. Any time.

For more information:

📞 888-778-2733

🌐 Visit www.SEreply.com and enter key code p358v

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