





## SUBSTATION CONSTRUCTION & MAINTENANCE

**Whether it's routine maintenance work at an existing substation** or the design and construction of a completely new facility, SERVICE ELECTRIC has the necessary resources and expertise to deliver the most challenging of substation projects on schedule and within budget. We have more than fifty years of HV & EHV substation construction and maintenance experience and we have a well-documented track record with various utilities throughout the southeast. We invest heavily in safety and skills training programs that enable our substation crews to stay abreast of evolving technologies and we have a proven quality control/quality assurance program that is integral to all of our substation projects.

Our crews are provided with the most advanced tools and equipment available and have access to patented tools and work procedures that enable us to perform many substation/switchyard maintenance procedures without taking the facility off-line. We offer complete testing and commissioning services, and with the support of other wholly owned Quanta affiliates, we provide complete EPC services.





## TRANSMISSION CONSTRUCTION & MAINTENANCE

The electric transmission industry has undergone many changes during the last few decades and SERVICE ELECTRIC'S Transmission Services Division has been there to help our customers meet these new challenges. Outage restrictions, right-of-way constraints, environmental considerations and new government regulations are but a few of the challenges that transmission services providers must take into consideration when planning a system upgrade, expansion or maintenance projects. Our response to these challenges has been to place a heavy emphasis on employee training, develop innovative new work procedures, add more modern equipment to our fleet and make the latest tools available to our workforce. The end result is that we have emerged a more competent supplier that is uniquely qualified to provide leading edge technologies to the transmission construction and maintenance sectors.

Our project experience includes all common transmission voltages up to and including 765kV and we are one of only a few service providers in the nation that have experience in the installation of 6 bundle conductor. We have been privileged to be a part of some of the more important and most challenging projects that have been completed in the last decade and we are uniquely prepared for the challenges of the future.





### DISTRIBUTION CONSTRUCTION & MAINTENANCE

**SERVICE ELECTRIC Company** has played a vital role in the distribution construction and maintenance industry in the southeast for more than 65 years. We have a proven track record of successfully completing challenging projects in a variety of environments ranging from the rugged mountains of Appalachia to the Florida Everglades. We also have extensive experience in densely populated urban settings from Chicago to Miami and many other major cities.

A major testament to our competency is the fact that we can readily provide excellent references from more than 50 electric utility companies.





## EMERGENCY RESTORATION SERVICES

Each year, **SERVICE ELECTRIC** mobilizes hundreds of personnel to the frontlines of recovery operations in the aftermath of hurricanes, tornadoes, ice and snow storms and other natural disasters. **SERVICE ELECTRIC Company** has emergency agreements with municipalities, cooperatives and investor owned utility companies throughout the country. We take great pride in our ability to quickly mobilize significant numbers of employees and equipment to anywhere in the nation. The testimonials we receive from residents and customers are proof positive that our response teams have the experience, know-how and compassion to restore the power safely, expeditiously and professionally.





### ENERGIZED TRANSMISSION & SUBSTATION SERVICES

**SERVICE ELECTRIC Company provides a wide range of HV & EHV energized services** to transmission system operators and the power generation industry. Our energized services resources include patented tools and work procedures, bare-hand, hot-stick and robotic competencies and a complement of managers, field supervisors and journeymen. Our personnel have successfully completed comprehensive safety and skills training programs that were designed specifically for employees assigned to energized projects. We require competency based certification testing for all bare-hand, hot-stick and robotic arm crews. Annual recertification is mandatory.

All SERVICE ELECTRIC energized transmission and substation projects enjoy the full support of Quanta's Energized Services group. Each potential energized project is reviewed

by this group and the work does not proceed until detailed procedures have been prepared and confirmation has been made that the work can be executed safely and efficiently.





## UNDERGROUND CONSTRUCTION & MAINTENANCE

**The demand for electrical services to be installed underground continues to grow.**

Whether in densely populated metropolitan areas or suburban residential communities, owners and customers have a need and desire to go underground. Our capabilities and experience encompass a full range of services including:

- Power and control cable pulling, splicing, terminating and testing
- Installation, terminating and switching of underground transformers
- Joint Trench, Electric, cable and telecommunications installations
- Network/Ductwork (trenching, directional boring, duct banks, manholes and electrical vaults)
- Replacement and re-routing of existing underground cable without service interruption
- Site preparation and civil work, including foundation for major equipment, buildings and structures
- Concrete and Asphalt restoration associated with duct work
- Specializing in Deep Shoring in unstable soil conditions





## COMMISSIONING & TESTING



**SERVICE ELECTRIC'S engineers and technicians can provide** complete new installation start-up as well as routine maintenance testing for all electric substations.

### OUR TESTING AND SERVICES INCLUDE:

- Automatic Complex 3 Phase Relay Units
- Control Scheme Verify (Trip Checking)
- Battery/Charger System Analysis
- Power Factor Test
- Sweep Frequency Response Analysis
- Transformer Turns Ratio
- Transformer, Breaker, and Switch Resistance
- Breaker Timing
- SF6 analysis
- Megger/Hipot
- Current Transformer Test
- Potential Transformer Test
- Ground Grid Resistance
- Ground Bonding
- Oil/Dielectric Integrity

## HIGH VOLTAGE OIL & SF6 BREAKERS

**SERVICE ELECTRIC offers expert installation and commission** of new and used high voltage circuit breakers. With the expanded use of SF6 gas in the electric industry, our technicians are trained in proper handling and testing techniques of this new medium.



## TRANSFORMER ASSEMBLY

**SERVICE ELECTRIC provides power transformer assembly and oil filling services** that include assembly of radiators, bushings, pumps, gauges and associated electrical components.

After SERVICE ELECTRIC arrives on site, our transformer specialists will assemble the transformer components and conduct a pressure test. The vacuum system in our oil processing rigs pulls vacuum to manufacturer's specifications and maximizes our ability to remove moisture and air voids in the windings as well as moisture in the oil. We utilize our rigs for test monitoring, standard oil testing, and dew point testing.

When assembly and vacuum filling are completed, SERVICE ELECTRIC trans-

former technicians can perform all electrical testing, including Power Factor testing and acceptance testing.

If you are planning to relocate, install or replace a transformer, SERVICE ELECTRIC offers the following services:

### OUR SERVICES INCLUDE:

- Complete transport and rigging
- Complete transformer assembly
- Pressure testing
- Commissioning
- Degasification and dehydration
- Power factor testing
- Electrical Testing
- Vacuum filling

## LOAD TAP CHANGER (LTC) REPAIRS

Load tap changers account for 20 percent of all power transformer failures. In substations, problems with LTCs are the single largest maintenance and repair issue.

### SERVICE ELECTRIC CAN PROVIDE LTC:

- Inspection
- Oil Filtration Upgrades
- Upgrades
- Fluid Replacement
- Rebuilds

*We provide comprehensive LTC service with minimal outages for testing, repairs, rebuilds, or upgrades.*



## SUBSTATION EQUIPMENT SPECIALIST:



- Transformers
- Load Tap Changers
- Current Transformers
- Potential Transformers
- Reclosures
- Oil Circuit Breakers
- Vacuum Circuit Breakers
- SF6 Breakers
- Circuit Switchers
- Voltage Regulators
- Switchgear
- Control Cables

## ELECTRICAL TESTING

Substation equipment reliability and stability are fundamental to the power delivery systems in your facility. Power transformers and associated equipment are a significant investment and you expect to keep them functioning trouble-free for as long as possible. SERVICE ELECTRIC has the tools, instrumentation and technical expertise to perform any electrical testing needed for analysis of your equipment's condition.

### OUR CAPABILITIES INCLUDE:

- Power factor testing
- Sweep Frequency Response Analysis
- Transformer Turns Ratio
- Resistance
- Megger
- Current Transformer test
- Potential Transformer test



## TRANSFORMER OIL SERVICES

### FLUID ANALYTICAL SERVICES AND OIL PROCESSING FOR YOUR TRANSFORMER:

As transformers age, gases and contaminants can dissolve in their fluid and lead to transformer failure. Transformer oil maintenance is the key to transformer reliability, performance and longevity.

Your transformer's insulating oil should be free from moisture, dissolved gases and particles that accumulate as the oil ages. Even some new oils may require treatment to limit these contents to acceptable levels.

SERVICE ELECTRIC'S five oil processors (150GPH-2400GPH) have standard transformer oil testing and monitoring, onboard fuller's earth and vacuum filling capabilities with systems designed to ensure the efficient, safe, and most reliable service to process your transformers.

### SPECIALTIES INCLUDE:

- Vacuum filling
- Degasification
- Hot-Oil splash with vacuum
- Thermal Cleaning utilizing Fuller's Earth with inhibitor added
- Dehydration
- Insulation dry-outs
- Cold Trap Moisture Monitoring