

# K&A Substation Services



## Overview:

We offer extensive engineering support, from design and drafting to calculations to professional engineer stamping (Engineer of Record). Our internal quality control process ensures our designs and other work products are precise, reducing the field's risk of errors.

## Structural Engineering:

### Drawing and Detailing

- ❖ Detail engineering
- ❖ Design requirements/drawings (Layouts, clearances, loading trees, foundation loads)
- ❖ Detail drawings (Shop Drawings)
- ❖ Erection drawings (Mounting of Pylon)

### Review and Evaluation

- ❖ Evaluation and validation of existing towers and foundations
- ❖ Towers and foundations reinforcement
- ❖ Seismic analysis of equipment and supports

### Engineering Design

- ❖ Designing and optimization of towers and foundations
- ❖ Lattice tower design
- ❖ Steel and wood poles design
- ❖ Prototype testing supervision
- ❖ Cable routing
- ❖ Substation Gantry

## Protection & Control Engineering

### Protective Relay Systems

- ❖ Overhead line, reactor, busbar, feeder, and cable protections
- ❖ Generator and transformer protection
- ❖ AC distribution and DC auxiliary power for systems

### Control Systems

- ❖ Start/stop automatic control and DCS data/local site control
- ❖ Auxiliary unit fully automated control
- ❖ Automatic voltage control

### Communication Systems

- ❖ LAN and WAN digital communication multiplex
- ❖ Power line carrier communications
- ❖ Microwave and HF radio
- ❖ (analogue/digital systems)

### Auxiliary and Ancillary Systems

- ❖ 220-24 v DC battery systems, UPS, statistics switching, and inverters
- ❖ Fault monitoring, the sequence of events, and oscillography
- ❖ Protective relay setting calculation, provision, and management
- ❖ Path loss, attenuation, and routing



## Services Offered:

### Physical Design

- ❖ General Arrangement
- ❖ Bill of Materials
- ❖ Erection Diagram
- ❖ Grounding
- ❖ Conduit
- ❖ Lighting
- ❖ Lightning Protection

### Electrical/ Relay/Control

- ❖ One-Line Protection Design Schemes
- ❖ AC and DC Schematics
- ❖ Relay Panel Design
- ❖ Wiring Diagrams
- ❖ Logic Diagrams
- ❖ ASPEN – Short Circuit Coordination
- ❖ Relay Settings
- ❖ Load Flow
- ❖ Harmonics Studies

### Civil / Structural

- ❖ Structural Calculations
- ❖ Steel Assembly Diagrams
- ❖ Steel Fabrication Drawings
- ❖ Foundation Calculations
- ❖ Foundation Plan and Detail Drawings
- ❖ Site Grading

### SCADA/ Substation Automation

- ❖ Interface with all RTU's
- ❖ IEC61850 Digital Substation

### Substation Engineering

- ❖ Feasibility Studies
- ❖ Cost estimates
- ❖ Conceptual and Detailed Design
- ❖ Technical Specifications (Supply and Construction)
- ❖ Defining upgrades and refurbishments to existing substation compensators

## Automation & Communications

- ❖ Allowing high-voltage transmission lines and power plants to operate in real-time
- ❖ Turnkey delivery supporting telecommunication networks
- ❖ Installation of telecommunication networks for fully automated and operationally optimal power distribution networks
- ❖ SCADA systems enable effective, live monitoring for control and protection
- ❖ Presence in administrative buildings, substations, stations, power plants, and dams
- ❖ Microwave relays, fiber optic overhead ground wires, wireless networks, analog to a digital replacement, upgrading power systems in telecommunication rooms

## Headquarters

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