

# High Voltage Protection & Control Project Profiles



*Committed to providing cost-effective solutions that make you more effective!*

## **Dayton Power & Light Company—Killen Station**

Relay Upgrade Project

- Complete upgrade of all plant relaying including Generator, GSU, Combustion Turbine and Auxiliary Transformers
- Types of Relays Included: SEL-300G, 487E, 387, 751
- Project includes engineering, design, drawings, fabrication of new relay panels, installation, relay programming, startup and commissioning

## **National Grid—Kent County Substation**

Commissioning of Complete Upgrade of Substation

- Replacement of existing 345kV and 115kV oil circuit breakers with SF6 breakers
- New relaying cabinets, point-to-point wiring checks and update drawings, replace electro-mechanical relays including uploading and testing relay programming files
- Types of Relays Included: Transmission/Distribution/Generation—GE, ABB, Schweitzer
- Project Notes: Project included testing of new CCVT's, CT's and Instrument Transformers

## **Alabama Power**

Multi-Year Contract for Relay Testing and Maintenance

- Substation/Transformer Protective Relaying
- FERC testing on existing electromechanical relays , 115kV to 230kV
- Types of Relays Included: Transmission/RTU/SCADA-GE, ABB, Westinghouse
- Project Notes: Project is ongoing, multi-year, renewed annually

## **E.ON U.S. – Green River Generating Station**

Green River Unit 3 & Green River Unit 4 NERC testing

- Prime Generating Unit – Generation Protective Relaying
- FERC testing on existing electromechanical relays on generators, GSU's, Unit Aux Transformers
- Types of Relays Included: GE / Westinghouse COQ, COV-8, CA
- Notes: Project involved testing / cleaning / inspecting

## **E.ON U.S. – E.W. Brown Generating Station**

EW Brown CT Units 8, 9, 10 & 11 FERC testing

- Combustion Turbine Peaking Site – Generation Protective Relaying
- FERC testing on existing electromechanical relays on generators, GSU's, Unit Aux Transformers
- Types of Relays Included: GE / Westinghouse (20+ different styles)
- Project Notes: Project involved testing / cleaning / inspecting

## **American Electric Power (AEP) - Tanners Creek, Pirkey, Clinch River Plants**

Protective Relaying and Switchgear Upgrades—Multiple Plants

- Upgrade of protective relaying from electromechanical to solid state relaying
- Design engineering, schematics, fabrication of new panels, assembly of new panels, field installation, testing and commissioning
- Types of Relays Included: SEL, Basler, GE Multilin

## **E.ON U.S. – E.W. Brown Generating Station**

EW Brown CT Units 5, 6 & 7 – ABB relay firmware upgrade and FERC testing

- Combustion Turbine Peaking Site – Generation Protective Relaying
- Upgrade firmware on ABB REG216 multi-function protective relays and perform FERC relay testing & associated documentation
- Types of Relays Included: ABB REG216 relays
- Project Notes: Project involved firmware upgrades / testing / cleaning / inspecting

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**Satellite Service Center Location**  
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### **E.ON U.S. – Ohio Falls Generating Station**

Ohio Falls – Unit 6 Start-up & Commissioning

- Hydro Generation – Generator Upgrade / Relaying Upgrade / Excitation Upgrade
- Work w/ Sub-contractor on start-up / commissioning / old relay testing / new relay commissioning / initial generation
- Types of Relays Included: Basler DECS300, BE1-CDS220, GPS100 / ABB Synchrotract 5 Auto-Synch
- Project Notes: Project involved troubleshooting / mitigating various wiring, infrastructure, insulation and installation-related issues

### **Greater Cincinnati Water Works—Multiple Pumping and Treatment Stations**

Protective Relaying and Switchgear Upgrades—Multiple Projects

- Upgrade of protective relaying from electromechanical to solid state relaying
- Project included 100+ MV motor, transformer and feeder circuits
- Design engineering, schematics, fabrication of new panels and doors, assembly of new panels and doors, field installation, testing and commissioning
- Types of Relays Included: Basler, GE Multilin

### **E.ON U.S. – Ghent Generating Station**

Ghent Unit 1 & Ghent Unit 3 Generator Protective Relaying Upgrade

- Prime Generating Unit – Generator Protective Relay Upgrade & Electromechanical Relay Testing
- Work w/ Sub-contractor on start-up / commissioning / old relay testing / new relay commissioning / initial generation
- Types of Relays Included: Beckwith Generator Protective Relays M3425A/ Existing Electromechanical Relays/ Westinghouse HU, HU-1, CO-7, CO-8
- Project Notes: Project involved design engineering support / testing / troubleshooting / programming / initial start-up

### **E.ON U.S. – Cane Run Generating Station**

Cane Run Unit 5 & Cane Run Unit 6 Auto-Synchronizer Installation / Start-up / Commissioning

- Substation / Generating Plant: Prime Generating Unit – Generator Auto-Synchronizer
- Type of Relaying Project: Work w/ plant personnel on installation / programming / start-up / commissioning
- Types of Relays Included: Basler Auto-Synchronizer
- Project Notes: Project involved testing / troubleshooting / programming / initial start-up

### **Florida Power & Light Energy – Calhoun Station**

Relay Testing

- Substation / Generating Plant: Generation
- Type of Relaying Project: Work w/ plant personnel on installation / programming / start-up / commissioning
- Types of Relays Included: Transmission/Generation, 230kV

### **Kent State University**

Central Utilities Plant

- Generation / Co-Generation
- 5KV Switchgear, Ohio Edison / First-Energy interface relaying, Combustion Turbine Relaying
- Types of Relays Included: GE SR750, SR745, SR735, SR489 / Basler BE1-25A, BE1-32R, BE1-87
- Project Notes: Project was multi-year / engineering / coordination study/ coordinate w- utility / design verification / install / correct prior protective relaying issues / commissioning / start-up / etc

### **Children's Hospital**

Central Garage & North Garage 15KV Generation & Distribution Switchgear w/ Utility Paralleling

- Substation / Generating Plant: Back-up Generation / Peak-Shave Generation / Primary Distribution
- Type of Relaying Project: 15KV Switchgear, Duke (CG&E) interface relaying, Distribution Relaying, Design, Install Oversight, Commissioning
- Types of Relays Included: GE SF750, GE SR489 / Basler BE1-87/ Woodward MSLC & DSLC generation controls
- Project Notes: Project was multi-year / multi-phase / engineering / design verification / coordinate w- Utility / commissioning / start-up

### **Sunoco Oil – SunCoke**

SunCoke – Haverhill Phase II Cogeneration Installation (new installation)

- 80MW Cogeneration HP steam turbine
- Work w/ owner, construction personnel, start-up personnel on total system: Gen Breaker, GSU, Relaying, etc.
- Types of Relays Included: SEL 300G, SEL311L, SEL 351, GE SR745, GE 489, GE L90
- Project Notes: Project involved testing / troubleshooting / programming / initial start-up / wiring check-outs / breaker testing

**Xcel Energy**

Crooked Lake (CRL) Substation – Coon Rapids, MN

- New SEL-421 and SEL-311C line protection (primary and secondary) relaying
- End-to-end testing in conjunction with Great River Energy
- Upload & configure relay settings
- Updated trip switch index cards, updated breaker faceplate push-button index cards
- All new wiring verified, station annunciator points confirmed, alarm points to 'back room' (Xcel master control center) confirmed
- On-site for energization, check loads and confirm with 'back room'
- New GE RFL9745 Transmitter/Receiver

**Xcel Energy**

West Sioux Falls (WSF) Substation – Sioux Falls, SD

- New SEL-451 breaker failure relay
- Upload & configure relay settings
- Performed relay testing, updated trip switch index cards, updated breaker faceplate push-button index cards
- Confirmed/corrected all new wiring
- Confirmed all new alarm points to station annunciator and with 'back room'
- New HV Circuit Breaker BKR 5TR
- Performed all isolation procedures for breaker
- Confirm all new wiring
- Test CTs
- Double check all wiring for tightness, correct CT polarity and taps per three-lines
- Functionally test breaker – including confirming every new device in DC Schematic as well as some prior existing devices
- On-site for energization, check loads and confirm with 'back room'

**Xcel Energy**

Split Rock (SPK) Substation – Sioux Falls, SD

- New Bus 1 CCVT
- Isolate old PT for removal (and temporarily jumper outputs from Bus 2's PT in control house)
- New CCVT wiring verification
- On-site for energization, check voltages and confirm with 'back room'
- Eleven (11) New HV Circuit Breakers
- Performed all isolation procedures for breaker
- Confirm all new wiring, Test CT's
- Double check all wiring for tightness, correct CT polarity and taps per three-lines
- Functionally test breaker – including confirming every new device in DC Schematic as well as some prior existing devices
- On-site for energization, check loads and confirm with 'back room'
- New SEL-451 breaker failure relay
- Upload & configure relay settings
- Performed relay testing, updated trip switch index cards, updated breaker faceplate push-button index cards
- Confirmed/corrected all new wiring
- Confirmed all new alarm points to station annunciator and with 'back room'

**Xcel Energy**

Gleason Lake Substation – Minneapolis, MN

- New SEL387 Current Differential Relay
- Upload & configure relay settings
- Performed relay testing, updated trip switch index cards
- Confirmed/corrected all new wiring
- Confirmed all new alarm points to station annunciator and with 'back room'

**Xcel Energy**

Glen Lake (GNL) Substation – Minnetonka, MN

- Two (2) New HV Circuit Breakers BKR 4M11 & BKR 4M13
- Performed all isolation procedures for breaker
- Confirm all new wiring, Test CT's
- Double check all wiring for tightness, correct CT polarity and taps per three-lines
- Functionally test breaker – including confirming every new device in DC Schematic as well as some prior existing devices
- On-site for energization, check loads and confirm with 'back room'
- Confirm new alarm points/wiring to station annunciator and to 'back room'

**Xcel Energy**

West Fairbault (WEF) Substation – Fairbault, MN

- Two (2) New HV Circuit Breakers BKR TR1 & TR3
- Performed all isolation procedures for breaker
- Confirm all new wiring, Test CT's
- Double check all wiring for tightness, correct CT polarity and taps per three-lines
- Functionally test breaker – including confirming every new device in DC Schematic as well as some prior existing devices
- On-site for energization, check loads and confirm with 'back room'
- Confirm new alarm points/wiring to station annunciator and to 'back room'

**Xcel Energy**

St. Joseph, Lafayette, and Avon Substations – Multiple Sites, MN

- New SEL 2411 Programmable Automation Controller
- Upload & configure relay settings
- Test & Commission SEL2411 controller
- I/O Configuration
- Balance of communication equipment configuration for Capacitor controls including wire tracing, transducers, etc.

**Xcel Energy**

Parker's Lake Substation – Minneapolis, MN

- Two (2) New HV Circuit Breakers
- Performed all isolation procedures for breaker
- Confirm all new wiring, Test CT's
- Double check all wiring for tightness, correct CT polarity and taps per three-lines
- Functionally test breaker – including confirming every new device in DC Schematic as well as some prior existing devices
- On-site for energization, check loads and confirm with 'back room'
- Confirm new alarm points/wiring to station annunciator and to 'back room'
- Two (2) New SEL-451 breaker failure relays
- Upload & configure relay settings
- Performed relay testing, updated trip switch index cards, updated breaker faceplate push-button index cards
- Confirmed/corrected all new wiring
- Confirmed all new alarm points to station annunciator and with 'back room'