



# Turnkey Unit-Substation Control Panel Upgrade Project Adds Remote Control and Data Acquisition

**S&C Featured Solution:** Unit-substation protection and control panels

**Location:** Eastern United States

## Customer Challenge

A large Eastern U.S. electric utility company, with the engineering, equipment supply, and project management assistance of S&C Electric Company has undertaken a project to upgrade the protection and control panels for a number of unit-substations feeding suburban-type loads. The utility has an installed base of more than 800 unit-substations furnished by five different manufacturers. Each unit-substation consists of a transformer and a load-side circuit breaker. At some sites, two transformers and breakers are duplexed, with a tie breaker installed on the load side. The tie breaker is used to transfer load to the second transformer if service to one transformer is lost. The existing equipment includes a variety of electromechanical relays and control devices that were replaced with a single microprocessor-based distribution protection and control terminal from S&C/ZIV.

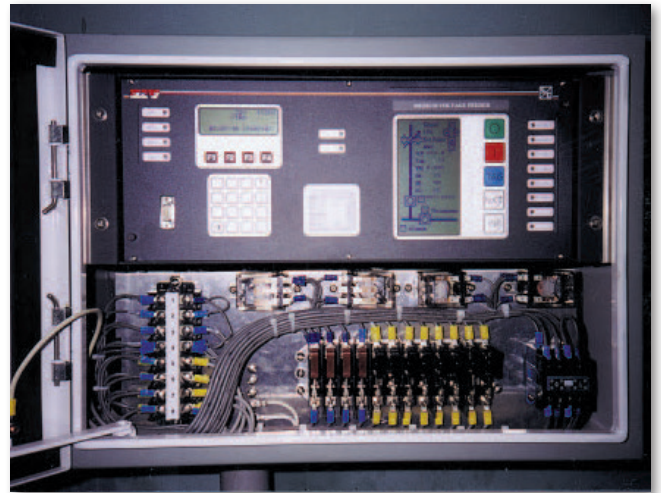
The new protection and control panel performs the following functions:

- Load-side circuit-breaker control and indication
- Tie circuit-breaker control and indication (for duplexed unit-substations)
- Transformer tap-changer control and indication
- Relay protection
- Supervisory control and data acquisition

## S&C Solution

S&C engineered and supplied a turnkey control-panel upgrade solution for a pilot group of four unit substations—two duplexed sites. Major phases of the project included the following:

- System design and communications engineering
- Cabinet fabrication (including mounting and wiring of materials)
- Programming



- Documentation
- Factory testing
- Site-specific engineering drawings and diagrams, as are necessary for installation, operation, maintenance (including troubleshooting and testing), or modification of the equipment
- Installation
- Field testing

The new control panel has been designed to be universally suitable for use with all of the customer's unit-substations, regardless of manufacturer or style. The control panel communicates with the master station through a modem contained in a separate communications and power supply unit, which also provides control power for the unit-substations. The communications protocol is DNP 3.0.

## Results

The primary benefit afforded by the new control panel is remote supervisory control and data acquisition. The utility can now monitor load current at the unit-substations and reconfigure circuits as necessary to avoid transformer-life-reducing overload currents.