CASE STUDY
RENEWABLE ENERGY
INTEGRATION

S&C ELECTRIC COMPANY
Excellence Through Innovation

Power from the Sun: Mark V Circuit-Switchers with Solar-Powered Type CS-1A Switch Operators

S&C Featured Solution: Renewable Energy Integration

Location: Brazil

Customer Challenge

One of the largest utilities in Brazil has 80 Mark V Circuit-Switchers installed on their transmission system—custom-engineered to mount on 50-foot-high tower structures. A recent expansion of their system called for the installation of three new Mark V Circuit-Switchers and retrofitting of two existing Mark III Circuit-Switchers. The five Circuit-Switchers were to be furnished with automation controls that would allow them to be operated by the utility's SCADA system. The challenge… finding a cost-effective way to provide control power to the associated Type CS-1A Switch Operators.

S&C Solution

After considering several options, S&C suggested using inexpensive solar panels to charge the battery array installed under each tower.

The power requirements of the Type CS-1A Switch Operators were a major concern. Although the Circuit-Switchers would mainly be used for sectionalizing and load switching, and only operated 5 or 6 times a month, the RTUs and space heaters would need a constant supply of power. To select the correct configuration of solar panels and batteries, local weather records for the Sao Paulo region were checked to estimate the available daily sunlight.

A system consisting of four solar panels, a battery-charger control module, batteries, and battery enclosure was selected. Temperature and humidity controls were installed in each Type CS-1A Switch Operator to prevent the space heater from unnecessarily drawing power from the batteries during hot, dry weather. And voltage sensors were installed to allow the SCADA control center to monitor available solar control power at each Circuit-Switcher.

Results

Utility engineers visited S&C's Brazilian facility to witness factory testing of the automation controls. The solar panels and batteries were connected to simulate real-life field conditions—including available sunlight and simulated switching duty. During the test, the RTU was signaled directly from the operation center, located 248 miles away! The cellular-phone-based control system allows operating personnel to check the status of the Circuit-Switchers—open or closed—as well as monitor control voltage, and select local or remote operation.

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The utility is thoroughly pleased with their solar-powered Circuit-Switchers. Solar panels can be similarly used to provide control power for Series 2000 Circuit-Switchers and Trans-Rupter II® Transformer Protector. Contact your nearest S&C Sales Office for details.