



# State Grid of China Expands Network with Automated Design Tool

Connected Grid Design Suite Helps Plan Thousands of Substations

**Customer Name:** State Grid of China Corporation

**Industry:** Electric Utilities

## Business Impact

Powerful tool enables faster expansion planning:

- Supports rapid growth strategy, including up to thousands of substations
- Reduces costs and remote visits to sites
- Promotes rapid, accurate communications network design
- Allows auto-discovery of IEDs
- Enables modeling for standardized implementations
- Optimizes substation commission and operations



## Business Challenge:

State Grid of China Corporation provides more than three-quarters of the energy used in China today, including both residential and industrial customers. The company continues to face rapidly increasing demand over the next five years, with an anticipated growth requirement of 18 percent.

To meet this challenge, State Grid has set the ambitious goal of building 5000 new substations and retrofitting 2000 more by 2016. Each substation is supported by an IP-based communications network to enable efficient monitoring and maintenance. By relying on a digital model, the organization benefits from safer, more reliable stations which are cheaper to run.

However, the company has been challenged on how to rapidly implement, commission, and monitor so many new facilities quickly. Typically, utilities must manage multiple types of vendor equipment in the substation, creating a complex configuration at each site. State Grid turned to Cisco Services and the Cisco® Connected Grid Design

Suite to help create a standard deployment plan, debug installations, and efficiently test and monitor each newly commissioned system.

## Solution and Results:

The Cisco Connected Grid Design Suite provides an interface that allows engineers to dynamically design, secure, model, and test the LAN both before and after deployment. Using the tool, State Grid engineers worked with Cisco Services experts to create a substation design that utilizes original and imported Common Information Model (CIM) models and International Electrotechnical Commission (IEC) 61850 intelligent electronic device (IED) Substation Configuration Language (SCL) configuration files. Auto-discovery of IEDs allowed the team to visualize the relationship between the energy delivery network and its protection schema, rendering the energy delivery network and its protection as an easy-to-use, one-line diagram overlaid by the communication network. Engineers also were able to track changes to the network and identify gaps between the design and actual configuration,

while storing information from routers, switches, and IEDs in a central data repository.

Cisco Services successfully created the Yunhui 220 kV substation communications network strategy as a proof of concept for the State Grid subsidiary Hangzhou Electric Power Company, with two more to be commissioned within a few months. The tool is now being used to test and simulate the communication network in real time in the new substations. It also provides logs to support real-time monitoring and an audit trail.

## Cisco Connected Grid Services

Cisco Connected Grid Services partners with utilities to prepare for the future of the smart grid, helping to secure and automate the entire energy chain and increase grid reliability and responsiveness. Providing comprehensive planning and development services, Cisco experts assess a utility's current position and capabilities, and provide innovative, cost-effective options for optimizing present and future investment.