



Shawan Cascade Control System - SCADA/GMS

**Sector of activity :**

Energy Control Systems

**Client :**

Sichuan Electric Power Company

**Year of completion :**

1999

**Financing :**

Export Development Corporation

**Mandate :**

To design, supply, install, and commission a new Shawan Computer Control and Supervision System (CCSS) for the Sichuan Electric Power Company, which operates the provincial power transmission network in Sichuan province of China. The scope of work included the delivery of all hardware, software, documentation and training for the new system, as well as all necessary testing, field installation and adaptation services.

**Description :**

Sichuan Electric Power Company operates and maintains the transmission network in Sichuan Province of China. Located in southwest China, Sichuan is one of the largest provinces in the nation, covering an area of 485,000 square kilometres and boasting the largest population in China, with 87 million people. The provincial power network has a total installed capacity of 15,000MW, 62% hydro and 38% thermal. The power network consists of ten 500kV lines, one hundred forty-three 220kV lines, two 500kV substations, and fifty-six 220kV substations.

The SCADA/GMS supplied by SNC-Lavalin Energy Control Systems for the Shawan CCSS is used to monitor and control two cascade hydropower stations, Gongzui and Tongjiezi, located

on the Dadu river. Gongzui is situated approximately 33 km upstream of Tongjiezi, and has an installed capacity of 700 MW (7x100 MW). Tongjiezi has an installed capacity of 600 MW (4x150 MW), and the two combined have an installed capacity of 1,300 MW. These hydropower stations have the two largest installed capacities among power stations in the Sichuan province. They play an integral role in the power network including peak load, frequency regulation, and serving as reserved capacity under abnormal conditions.

The SCADA/GMS performs centralized remote real-time control and coordination of the two power stations, and provides sophisticated cascade control applications such as load forecasting, generation scheduling, automatic generation control, automatic voltage control, economic dispatch, interchange scheduling, and reserve monitoring.

The SCADA/GMS is based on a distributed client/server architecture designed to internationally recognized standards. Commercial off-the-shelf equipment is used throughout the system, which provides simplified maintenance and easier system expansion. The system includes HP Alpha servers, HP Alpha workstations, console furniture, communication

equipment, uninterruptible power supplies, large screen display, and other peripheral equipment connected to a local area network. The system is fully redundant to ensure high availability, and provides automatic fail-over features.

The SCADA/GMS software is based on the GEN-3 product developed by SNC-Lavalin Energy Control Systems, and uses the Oracle RDBMS for database management, historical data storage, and reporting. The system uses the DL-476-92 protocol for communicating with the power stations. The user interface supports Chinese character entry and display capabilities.

Customer training consisted of formal classroom training and on-the-job training (OJT) for operating and maintaining the SCADA/GMS.

**Services provided :**

A turnkey contract including project management, hardware, software, system integration, acceptance testing, documentation, customer training, and all necessary field installation and adaptation services.



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