



C.V.G. Electrificación del Caroni C. A. (EDELCA) – Guri Hydroelectric Power Plant

Sector of activity :

Energy Control Systems

Client :

Electrificación del Caroni C.A. (EDELCA)

Year of completion :

2001

Financing :

Client

Mandate :

To design, supply, install, and commission a new Generation Management System (SCADA/GMS) for C.V.G. Electrificación del Caroni C.A. (EDELCA), to monitor and control the Guri hydroelectric power generation complex. The scope of work included the delivery of all master station hardware and software, remote terminal units, documentation and training for the new system, as well as all necessary testing, field installation and adaptation services.

Description :

C.V.G. Electrificación del Caroni C.A. (EDELCA) is Venezuela's largest supplier of hydroelectric power. EDELCA operates the Macagua, Caruachi, and Guri hydroelectric generating plants.

The Guri Dam is the world's second largest hydro-electric plant in terms of power production capability. It has two powerhouses, each containing ten hydroelectric generating units; the total capacity of the 20 generating units is 10,000 MW. The power plant has three high-voltage switchyards operating at 800 kV, 400 kV, and 230 kV, each arranged in a breaker-and-half configuration.

EDELCA is a repeat customer for SNC-Lavalin Energy Control Systems, having purchased the previous SCADA/GMS in the 1980's.

For this project, SNC-Lavalin Energy Control Systems provided a new SCADA/GMS systems installed at the Guri Dam in Venezuela. The SCADA/GMS is configured with modern, state-of-the-art generation management functions such as Automatic Generation Control, Automatic Voltage Control, Economic Dispatch, Reserve Monitoring, Spillway Gate Control, Unit Commitment, and Dispatcher Training Simulator. A fibre optic communication network was implemented to connect the power plant RTUs and switchyard RTUs to the master station.

The SCADA/GMS system is based on a distributed client/server architecture designed to internationally recognized standards. Commercial off-the-shelf equipment is used throughout the system, and includes HP Alpha servers, HP Alpha workstations, console furniture, communication equipment, mapboard controller, 32 remote terminal units, and other peripheral equipment. The SCADA/GMS 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. The database is maintained in an Oracle RDBMS stored on RAID-1 storage arrays, and is complemented by a set of memory-resident real-time databases that are replicated to all of the servers and workstations on the local area network for optimal performance. All database edits can be performed online without the need to failover any servers or workstations to bring the changes online. The system includes redundant Ethernet communication channels supporting the DNP3 IP protocol for communicating with the new remote terminal units. Redundant TASE.2 ICCP links were also provided for data exchange with external control systems.

Each SCADA/GMS provides valuable tools to assist in operating the electric power system to high performance standards, in particular, network security.

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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