

CASE

STUDY

Retrofit to IEC 61850 SAS
Beizi SS (Taiwan)



161/69/23/11 kV Beizi SS had a control system based on wired RTUs, which limited the information that could be controlled. With the migration to an IEC 61850 SAS, all the protection, control, measurement and supervision functions are integrated in one system, combining Ethernet technology with availability and safety.

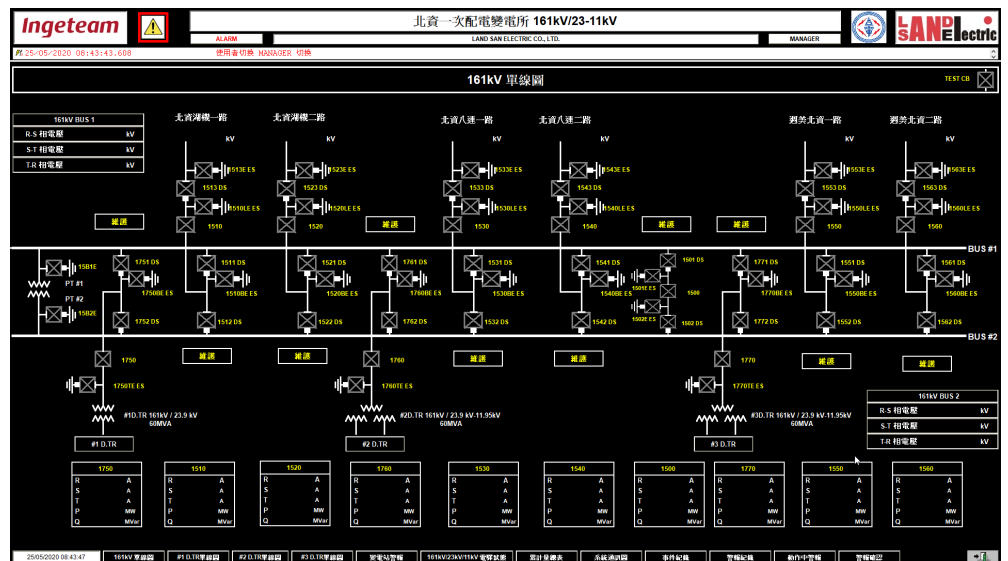
Ingeteam has participated in this project with the engineering, supply and commissioning of the Protection and Control system of the substation that integrates the power generated into the grid, using INGEpac™, INGESAS™ and INGESYS™ equipment.

The control architecture is based on the IEC 61850 standard with **PRP communications redundancy**, which guarantees high system availability and reliability.

Substation protection and control

Applications

- Renewable plants evacuation substations
- High and medium voltage substations



Overview

Substation gateway

Substation local SCADA

20 x MCC IED
(Measuring, Control &
Communication IED)

49 x PMCC IED (Protection,
Measuring, Control &
Communication IED)

Control and protection devices

INGESYS™ IT-eFS operation software - Gateway in hot-standby redundancy for Remote Substation monitoring, with DNP 3.0 redundant communication

INGESYS™ IT-eFS display and operation software - HMI in hot-standby redundancy for substation monitoring

Single Line diagram

- Different Voltages representation: 161 kV, 69 kV, 11-23 kV
- CB / DS / ES status
- Power flow
- Bus Line color change

Each Bay Single Line diagram

- Control
- Measurement
- Detail Information

System Architecture

- Communication Health

Protection Relay Overview

- Relay function: enable / disable
- Each Bay Control position

Measurement Overview

Trend

- Real-Time Trend
- Historical Trend

Daily Report

INGEPAC™ DA PT - Control and measurement IED

Located in 161/69 kV GIS room, transformer, line and substation switchyard protection

INGEPAC™ DA PT - Control and protection relay

Located in 22/11 kV CGIS room

Engineering services

- System control programming under IEC 61850 standard with PRP redundancy
- Database configuration and programming by means of DNP serial protocol
- Integration of existing protection relays by means of dry contacts
- Cybersecurity: Multilevel password system that makes available only the functions necessary to the different users
- FAT
- Control commissioning
- Point-to-point tests in order to check the correct communication with the Control Center
- Operation & Maintenance training

Highlights

- System according to IEC 61850 standard with Parallel Redundancy Protocol (PRP) and both Gateway and HMI in Hot-Standby redundancy
- All the screens display the information in the local language (Chinese)