

CASE

STUDY

34.5 / 230 KV Magdalena II
Substation Project (Mexico)



The **34.5 / 230 kV Magdalena II substation project** is a perfect example of the application of a **compact installation**, which houses all the control, protection and measurement panels in a prefabricated container.

E-House solutions guarantee the same functionality as conventional substations, reducing both the location space and installation and assembly time. Additionally, the allocation of all the equipment in a prefabricated building shelter allows **easy transport and relocation**, if necessary.

The control system supplied is based on a fiber optic ring topology under the **IEC 61850** standard, with control and protection equipment of the **INGEPAC™** product range.

E-House solutions



Applications

- Integration of renewable generation substations
- High and medium voltage substations



Unloading of the pre-fabricated hut with a crane

Overview

SE Magdalena II

Pre-fabricated hut

Pre-fabricated control building type SHELTER of 14 m x 4 m x 3 m (L x W x H) built using a combination of carbon steel structural profile, rigidly joined by micro-wire welding and steel sheet. The pre-fabricated container is equipped with interior and exterior lightning, grounding system, cooling vents, fire control system, stairs, air conditioning, trays, control cabling, fiber opti and desk.

230 kV line cabinet

2300 x 800 x 800 mm control and protection panel for 230 kV line
INGEPAC™ EF CD - Data acquisition module (MCAD)
INGEPAC™ EF LD - Breaker fail protection
L90 and SEL411L - Line protection relays
SEL735 meter
Switch

230 kV transformer cabinet

2300 x 800 x 800 mm control and protection panel for 235 kV transformer
INGEPAC™ EF CD - Data acquisition module (MCAD)
2 x INGEPA™ EF TD - Transformer differential protection
INGEPAC™ EF LD - Breaker fail protection
2 x INGEPA™ EF MD - Multifunction relay
Switch

Disturbance fault recording

2300 x 800 x 800 mm panel for Digital Fault Recorder
3 x Tesla 4003 - Digital Fault Recorder
Switch

DAG (Generation Automatic Trip)

2300 x 800 x 800 mm panel for DAG
INGEPAC™ EF CD - Data acquisition module (MCAD) for ancillary services
INGEPAC™ DA PT - Protection relay
GPS
3 x Switch

Engineering services

- Control, protection and measuring cabinet engineering
- Control system configuration under IEC 61850 standard
- Cabinet's FAT
- Control system preoperative and functional tests
- Third party relays' integration
- Transport, loading and unloading of pre-fabricated hut with a crane
- Control and protection commissioning
- Start-up of the Substation Assistant
- Training course

Highlights

- Reduced installation, transport and assembly time
- Shorter SAT time due to the equipment being supplied, assembled and tested at factory
- Reduction of the civil engineering works and commissioning at site
- Easy project management and maintenance
- Shorter overall delivery time