

CASE STUDY

Jasper PV plant
96 MW (South Africa)



The **Jasper photovoltaic park**, located near the city of Postmasburg, in the Northern Cape of the South African Republic, is a perfect example of the application of Ingeteam **protection, control and automation comprehensive solution** for electrical plants in the renewable energy sector.

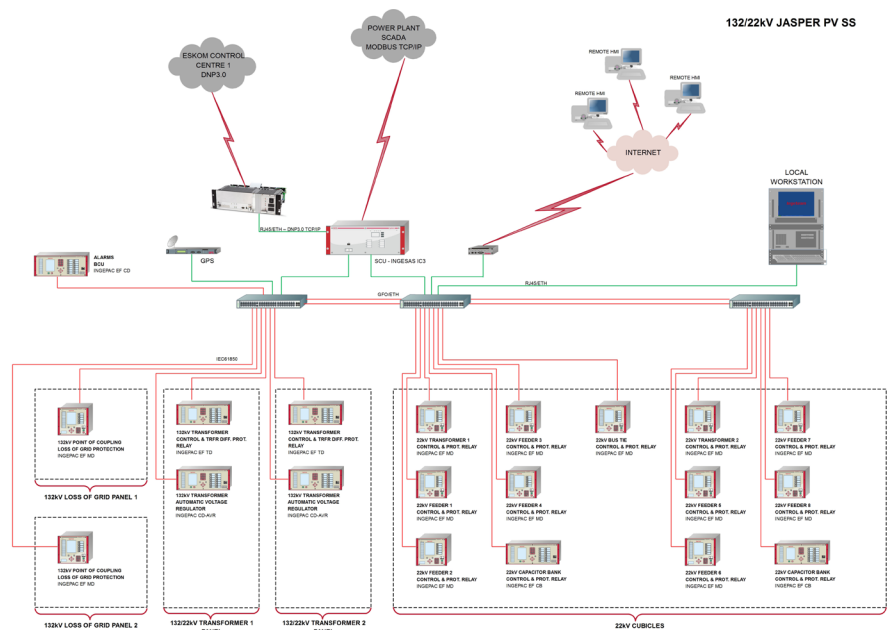
The Jasper PV Plant occupies a **180-hectare** site and is equipped with over **325,000 polycrystalline modules**.

For this project, Ingeteam Pty has supplied both the **control and protection cabinets** for the Kangaroo connection substation, owned and regulated by ESKOM (Transmission Grid Operator), and the comprehensive **IEC 61850-compliant control and protection solution** for the Jasper PV plant substation.

Protection and control for renewable plants

Applications

- Photovoltaic
- Wind
- Cogeneration
- Oil and gas
- Water treatment



Overview

4 x 132 kV line protection and control schemes

1 x 132 kV differential busbar protection scheme

1 x metering panel
1 x metering subpanel

1 x telecontrol system

1 x substation control cabinet

2 x loss of grid cabinet

2 x 132/22 kV transformer cabinet

13 x 22 kV cubicles

1 x metering panel
1 x metering subpanel

132 kV Kangaroo Substation

Control and protection panel with homologated main & backup distance/differential protections

Control and protection panel with homologated high impedance bus zone protection

Metering panel and subpanel
8 x integrated meter equipment

Homologated remote terminal unit (RTU)

132/22 kV JASPER PV Substation

SCU panel
INGESAS™ IC3 - Substation control unit
INGESYS™ eFS PRO - local HMI
INGEPAC™ EF CD - Auxiliary system interface
Homologated remote terminal unit (RTU)
Ethernet Switch

Loss of grid panels
2 x INGEPACTM EF MD - Control and protection relay

Transformer panels
2 x INGEPACTM EF TD - Transformer differential control and protection
2 x INGEPACTM EF CD - Automatic voltage regulator

2 x INGEPACTM EF MD - 22 kV transformer relay
8 x INGEPACTM EF MD - 22 kV incomer feeder relay
INGEPACTM EF MD - 22 kV bus tie relay
2 x INGEPACTM EF CB - 22 kV capacitor banks relay

Metering panel and subpanel
4 x integrated meter equipment

Services

- Full compliant IEC 61850 system configuration
- RTU configuration for communication with ESKOM control centre using DNP 3.0 protocol
- System integration into the Power Plant SCADA with Modbus TCP/IP
- Factory acceptance test of the control and protection panels
- Point-to-point tests of communication with ESKOM control centre using DNP 3.0 protocol
- Control system configuration
- HMI programming
- Control commissioning
- Training course

Highlights

- Supply of comprehensive IEC 61850-compliant control and protection solution