Wind Farms operation improvement and grid codes compliance.
Inrush blocking and sequential reconnection automatism in a self-powered protection unit.

Mrs. Izaskun Zamacona, Mr. Gorka De Elordi, Mr. Gorka Puertas
Ormazabal

PO.182

Abstract

The increase of the nominal power of WTGs implies more complex requirements in wind farms installations to fulfill different grid codes emitted by each country, and also more and more complex protection and automation functions to ensure the highest degree of availability and efficiency of the wind turbine systems.

New protection & control ekor.wtp rage is designed to continuously optimize the performance and energy generation of WTGs.

Objectives

To maintain the WTG under protection including the energizing process with a self-powered ekor.wtp protection unit which integrates a second harmonic blocking unit to avoid tripping due to inrush current.

To connect the WTGs sequentially by an automatism managed by a multifunctional ekor.wtp control unit. Different grid codes specify the voltage dips that the WTG must bear without disconnecting, and also the maximum voltage dip at the connection point caused by the inrush current when energizing too many transformers at the same time.

To gather and send to the SCADA the real status of the MV switchgear, the programmed automatism as well as the measurements (V, I, P, E) by these new multiprotocol ekor.wtp devices.

Methods

ANSI protection functions diagram:

Results

Dual & self powered ekor.wtp protection, metering and control devices that combine a full range of equipment to form comprehensive wind turbine generator protection units.

Conclusions

From its design phase to the operation and maintenance phase during the total working hours of a wind turbine generator, the ekor.wtp model range non-stopped optimizes the performance and energy production of on/offshore WTGs, improves turbine reliability and grid service capacity, while keeping them protected against electrical faults.

Features:

» Modular functionality
  » Self-powered protection features
  » Scalable automatisms
  » Remote control & comms

» Reliability
  » MTBF optimization
  » Programmable automatisms vs wired ones
  » Functional at low temperatures

» Personnel safety
  » Programmable automation
  » Alarms

References

1. Detected problems in wind farms electrical network and operation improvement. Advanced WTG dedicated protection and control systems, Mr. Iker Martin Guantange
2. How much does a wind turbine cost?, www.renewablefirst.co.uk