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Article
PCS100 ESS - Reducing electric power generation costs and emissions

Three-thousand feet above sea level, on mountainous Pegunungan Bintang, Oksibil, Papua, Indonesia, ABB's PCS100 Energy Storage System (ESS) in a solar power plant has radically changed community life.

Oksibil is a remote regency located in Papua province, Indonesia. The limited infrastructure and mountainous landscape have made the area only accessible by aeroplane. The area has been relying only on a single diesel power plant to generate power. However, it was costly and challenging to ensure the reliable supply of diesel. PT PLN (Persero), a government-owned electricity company, decided to build an off-grid solar power plant. With 1,280 solar modules, the plant has a 300 kWp capacity. ABB took pride to support this project by supplying:

ABB's solar solution

– One unit PCS100 ESS with four modules inside and maximum capacity of 315 kVA; The main function of PCS100 ESS is to perform automatic energy storage management system. The batteries are used to store excessive electrical power generated from PV modules during day time to be distributed during night time, or whenever required. The PCS100 ESS converts DC voltage of the batteries storage into AC voltage of the distribution grid (discharging mode) and also from AC voltage of the distribution grid into DC voltage of the battery storage (charging mode).
– One unit of 500 kVA dry type coupling transformer; The coupling transformer is the interface between 315 V output of PCS100 ESS and 380 V distribution grid voltage.
– One unit AC500 PLC - PM573: complete with HMI display CT430. The PLC acts as remote monitoring and automatic coordination control between PCS100 ESS and the back-up diesel generator.

Ferdinand Sibarani, Sales Engineer of ABB Power Electronics said, "This simple yet reliable system operation has significantly reduced power generation cost by minimizing the solar fuel consumption for diesel generator. ABB delivers high quality power in terms of voltage, frequency, as well as harmonic content". Additionally, he explained, "The PCS100 ESS has built-in web server so that its performance can be easily monitored using any web browser via LAN (Ethernet) as well as Internet. This feature helps a lot for monitoring". First commissioning was done in May 2012. The solar power plant operation started on 24 October 2012.

ABB's technology

Based on a low-voltage converter platform, the PCS100 ESS provides wide bandwidth performance with a flexible and highly modular power electronic configuration. New energy storage devices such as the latest generation batteries, flywheel and super capacitors enable energy from the electrical grid to be stored and later returned as needed. ABB offers innovative products for energy storage systems to support the increasing demand for highly efficient energy storage, renewable power integration and grid stabilization solutions. ABB's energy storage systems product portfolio highlights the ever growing demand for energy storage products, which empower industries to manage electrical grids and renewable energy sources more efficiently. ABB's tailor-made solutions for energy storage systems meet these requirements, providing high return on investment, minimal environmental impact and the required technology for smart grids.

For further information please visit:
www.abb.com/converters-inverters
(Converters for energy storage and grid stabilization)

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