Nidec
All for dreams

Case study

Battery energy storage system
United Kingdom

Project Summary

Project: Power grid stabilization and supply security
Application: Battery energy storage system

Nidec's Role

A large renewable energy development company chose Nidec Industrial Solutions to supply a 49 MW battery energy storage system for the United Kingdom's national grid.

Scope of Suppy

- 10 – 450 V, 6.6 kV Step up transformers
- 2 – HV distribution containers, with 9 switchgears each
- 20 – PCS and battery containers, including 5,044 battery modules
- HVAC system
- Fire protection system
- Electrical and mechanical erection
- Power and energy management systems
- SCADA system with national grid interface

The challenge:
To help achieve the United Kingdom's goals for power network stabilization and grid reliability

Due to the growth of renewable energy sources like wind and solar power, and the gradual decommissioning of coal-fired power plants, the grid in the United Kingdom has become more susceptible to sudden variations in power generation or consumption. To address a sudden surplus or deficit in supply, utilities traditionally relied on solutions that could respond to grid fluctuations in as little as 10 seconds. To stabilize today's grid, however, they need technologies that are capable of reaching full output or consumption in less than one second.

Because battery energy storage systems (BESS) can be designed to meet these Enhanced Frequency Response (EFR) requirements, a renewable energy development company sought to build a 49 MW BESS at an existing gas-fired generation site in the UK. The developer sought a partner experienced in electricity stabilization and power conversion technologies. It selected Nidec Industrial Solutions to engineer, supply and build the turnkey solution, which would be integrated with the plant's existing power management system.

The solution:
Europe's largest battery energy storage system

Designed by Nidec, the 49 MW, 36 MWh BESS is part of a new 200 MW EFR system that is being deployed across the UK to balance the nation's energy system, which includes a mix of renewables, nuclear and gas. It works by absorbing power during generation peaks and releasing it during demand peaks. Through frequency regulation and voltage control, the BESS would mitigate the threat of electricity service interruptions to critical load areas, while improving power quality and grid stability.

The new BESS – the largest of its kind in Europe -- consists of 20 "plug-and-play" PCS and battery modules, complete with power converters, transformers, batteries and a control system. Each BESS is mounted inside a container for easy transportation and installation.

In addition to the BESS, Nidec also provided HVAC, fire protection, power and energy management systems for the project, as well as a SCADA system that integrates with the national UK grid for performance and billing.

Nidec's innovative battery storage technology not only enables the UK's power grid to better accommodate renewable energy sources, it also minimizes greenhouse gas emissions and will be a source of revenue for the next two decades.