CASE STUDY 1:
KEITH HILL WINDFARM
POWER SYSTEM STUDIES

WINDCARE

Client:	**Windcare**
Industry:	**Renewables**
Plant Type:	**Wind Farm**
Project:	**System Studies**
Contract:	**Lump Sum**
Date:	**2016**

"SPE carried out a P28 Transformer Energisation Study, G5/4 Stage 3 Harmonics Study, Fault Ride Through Study, Reactive Power Compensation Study and an Earthing Study."

SPE was appointed by Windcare to undertake a series of power system studies for a new 4.5MW windfarm, connected at 33kV at the Keith Hill site near Edinburgh. Unusually for the project, the 33kV busbar was classed as a transmission system, so as well as the usual studies required by the DNO additional studies and coordination were required with National Grid.

SPE was responsible for carrying out all the key power system studies for the site in order to obtain approval of the DNO and National Grid. The studies carried out included a P28 transformer energisation study with PSCAD, a G5/4 Stage 3 harmonics study, a fault ride through study and reactive power flow study with ETAP and an earthing design study using CDEGS.

Liaising directly with the Client, the DNO, National Grid and the equipment manufacturer SPE was able to develop a detailed power system model of the network. Various simulation studies were then undertaken to demonstrate compliance with the standards. At the same time SPE also built a model in Digsilent to compare the performance of the two simulation packages, to begin the roll out of DigSilent across SPE's future T&D projects.

As part of the earthing design study, SPE subcontracted a soil resistivity to a local company, SPE then used CDEGS to develop a detailed model of the soil layers, fault current return paths and the earth grid, allowing us to perform a series of detailed touch and step voltage calculations for the site.

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