

Faults signature extraction in wind farm integrated Transmission Line topology

ABSTRACT

The integration of Renewable Green Energy Sources (RGES) like Wind Farm Generators (WFG), and Photo Voltaic (PV) systems into convention power system as a future solution to the increase in global energy demands, generation cost reduction, and limited climate impact. The innovation introduced protection compromise challenges in power system due to in-feeds fault current penetration from RGES on existing system, leading to an undesired trip of the healthy section of TL, equipment damages, and safety failure. A comparison study of extracted faults signature from two proposed Transmission Line (TL) network topologies with and without WFG integration, for onward fault identification, and classification model design. Discrete wavelet multiresolution Analysis (DWMRA) of extracted one-cycle fault signal signatures from 11 faults type's scenarios in Matlab. Result demonstrated a unique fault signatures across all simulated faults scenarios harness for future work of an adaptive unit protection model for this new area of DG integration.

Keyword: Renewable green energy sources; Entropy energy; Unit protection; Standard deviation