Revue Roumaine des Sciences Techniques

Volume 64, Issue 2, 2019, Pages 143-148

CONTRIBUTION TO RECONFIGURATION OF FAULT-TOLERANT INVERTER APPLIED TO THE WIND PARK CONNECTED TO THE ELECTRICAL NETWORK

Omar Fethi BENAOUDA, Azzedine Bendiabdellah, KAHLA SAMI

Abstract: This paper proposes a new diagnostic technique based on Park vectors associated with polar coordinates for the detection and location of open circuit (OC) faults, as well as the integration of fault-tolerant reconfigurable inverter in order to enable continuity of service of the wind farm system. The model used is that of a variable speed wind turbine coupled to a double-fed induction generator (DFIG) connected to the power grid via a fault-tolerant converter to improve performance after the appearance of the fault. This converter is used based on IGBT to obtain an acceptable accuracy with high switching frequencies. This model is well suited for the observation of harmonics and the dynamic performance of the control system over relatively short periods of time (typically hundreds of milliseconds to one second). This method allows extracting the maximum wind energy during a low wind speed by optimizing the turbine speed while minimizing the mechanical stress on the turbine during gusts of wind. To illustrate the diagnostic improvement of fault-tolerant inverter open circuit faults, several results are presented and discussed in this article.

Keywords : DFIG Turbine, Inverter, diagnosis, Detection, Location, Reconfiguration, fault, Open-Circuit, IGBT