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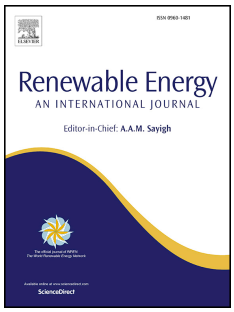

Current signature analysis to monitor DFIG wind turbine generators: A case study

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Current signature analysis to monitor DFIG wind turbine generators: A case study

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Abstract

As wind energy continues to develop with increasing wind turbine power capacities often deployed offshore, reducing operation and maintenance costs have become a critical aspect. Condition monitoring has been found to be the key to achieve this goal. Under this framework, the induction generator of a wind turbine is a major contributor to failure rates and downtime where doubly-fed induction generators are the dominant technology employed. This paper presents a spectral analysis of a real doubly-fed induction generator of an in-service wind turbine. A one-year measurement campaign on an operating wind turbine has been used to perform the study. Three test cases representing different wind turbine operating conditions are presented to illustrate the results. All the peaks found in the spectra have been identified, and the frequency components related to electrical rotor unbalance have been found. The results show which components are more suitable for effective condition monitoring.

Keywords: Doubly-fed induction generator; current signature analysis; condition monitoring; wind turbine.

1. Introduction

Predictive maintenance based on condition monitoring is currently recognised as the most efficient maintenance strategy for wind turbines [1] where

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