Title:	Performance analysis of self-excited induction generator for different excitation and loading condition in wind turbine application
Author(s) Name:	Rupak Kanti Dhar, Mrinal Kanti Dhar and Mohammad Abdul Mannan
Contact Email(s):	mdmannan@aiub.edu
Published Journal Name:	Int. J. Industrial Electronics and Drives (IJIED)
Type of Publication:	Journal
Volume:	4 Issue 2
Publisher:	Inderscience Enterprises Ltd.
Publication Date:	May 22, 2018
ISSN:	1757-3874
DOI:	https://doi.org/10.1504/IJIED.2018.091802
URL:	https://www.inderscienceonline.com/doi/abs/10.1504/IJIED.2018.091802
Other Related Info.:	Page 85-95

and loading condition in wind turbine application," Int. J. Industrial Electronics and Drives, Vol. 4, No. 2, pp. 85-95, May 22, 2018.

Abstract:

To ensure the complete control of AC machine, state analysis is highly required during the dynamic modelling. In this paper, a mathematical model of the self-excited induction generator (SEIG) is developed to analyse its operation in wind energy systems. A generalised steady state model using d-q stationary reference frame of such a three phase SEIG has been developed. The model has been analysed for balanced and unbalanced excitation condition. Moreover, the effect of wind speed and pitch angle in generator response is observed. Eventually, the model is tested for static and dynamic loads. The analysis of the results could help to determine the efficiency solutions for the system to supply isolated areas even when the loads are unbalanced. The derived equations and developed model are verified through the simulation results of MATLAB simulator.

Keywords: Self-excited induction generator, SEIG, wind turbine, excitation capacitor, pitch angle, dynamic load