AIUB DSpace Publication Details

Title:	Dynamic Analysis of Grid-Connected Hybrid Wind Farm
Author(s) Name:	Jannatul Mawa Akanto, Md. Kamrul Islam, Effat Jahan, Md. Rifat Hazari, Mohammad Abdul Mannan, Md. Abdur Rahman
Contact Email(s):	mdmannan@aiub.edu
Published Journal Name:	International Journal of Power Electronics and Drive Systems (IJPEDS)
Type of Publication:	Journal
Volume:	14 Issue 2
Publisher:	Institute of Advanced Engineering and Science (IAES)
Publication Date:	June 2023
ISSN:	2088-8694
DOI:	http://doi.org/10.11591/ijpeds.v14.i2.pp1230-1237
URL:	https://ijpeds.iaescore.com/index.php/IJPEDS/article/view/22281
Other Related Info.:	Page 1230-1237

Abstract:

Since the last couple of years, the expansion of grid-connected wind farms (WFs) has increased dramatically. The wind turbine might be a fixed-speed squirrel cage induction generator (FSWT-SCIG) or a variable speed wind turbine with a doubly-fed induction generator (VSWT-DFIG). The main disadvantage of FSWT-SCIG is its lack of ability to adjust power quality. Inversely, the VSWT-DFIG is a competitive wind turbine technology that allows for the effective management of both active and reactive power outputs. Moreover, it has some extraordinary functionaries rather than FSWTSCIG. However, the major downside to this system is that it only has a partial rating AC/DC/AC power converter, which is extremely expensive. Hence, to reduce the overall cost combining the implementation of VSWT-DFIG and FSWT-SCIG in a WF could be a feasible alternative. Therefore, a novel DFIG control technique is proposed in this article, which can keep the connection point voltage of the hybrid WF stable during dynamic analysis. To evaluate the proposed controller responses PSCAD/EMTDC software has been used.

Keywords:

DFIG; dynamic analysis; hybrid wind farm; PI controller; SCIG