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Design of Public Plug-in Electric Vehicle Charging Station for Improving LVRT Capability of Grid Connected Wind Power Generation

Publisher: IEEE Cite This Cite This PDF

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Abstract

Document Sections

I. Introduction

II. Proposed System

III. Control Strategy and Modes of Operation

IV. Simulation Results

» Result

Authors

Figures

References

Citations

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Metadata

Abstract: The growing worldwide mindfulness for a eco-friendly environment include with cost effective and greater accessibility of small scale generating units such as wind and PV which hoisted the interest in distributed generation. The promising emerging future transportation technology is Plug-in Electric Vehicle (PEV). But the issue coupled with the implementation of PEV is the utilities should upgrade the distribution system to meet the demand of this extra load. Thus the integration of microgrid and PEV with distribution system reduces the stress on distribution transformer to meet the demand of the extra load. In this work, the PEV charging station with small scale wind energy system as a primary source to this smart charging station. The control strategy proposed is the coordinate control based on DC link voltage to encourage the operation of PEV charging station in both standalone and grid connected mode. There is a drawback when using Doubly Fed Induction Generator (DFIG) based wind turbine is Low Voltage Ride Through (LVRT). In order to overcome from this issue the charged even in the smart charging station used to improve the LVRT capability.

Published in: 2018 International Conference on Soft-computing and Network Security (ICSNS)

Date of Conference: 14-16 Feb. 2018 **INSPEC Accession Number:** 18345662

Date Added to IEEE Xplore: 13 December 2018 **DOI:** 10.1109/ICSNS.2018.8573632

Publisher: IEEE

ISBN Information:

Conference Location: Coimbatore, India

Contents

I. Introduction

Already the Plug-in Electric Vehicles (PEVs) entered into the automotive market and it becoming a part of electrical power system. In entrance of PEVs in market makes the genuine impact in the life span of distribution transformer. In order to reduce the load on distribution transformer there is a need of smart charging station with renewable energy sources [1]. Charging station of PEVs which is supplied by small scale wind energy system is reasonable option because of the following reasons: •

Immense advancement in the innovation of power converter technology for small scale wind energy system.

- Excess electricity productivity of the system from slow winds which are frequent.

Authors

Figures

References

Citations

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