Study of the Integration Method on the Control of Wind Power System

BY

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Abstract

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The paper included theoretical and experimental work on analysis of characteristics of permanent magnet synchronous generator (PMSG) mainly explores on different drive models at all working wind speeds. A latest sensor less control strategy is applied in the algorithm for maximizing the power output. In fact, the new method is modified from the wind turbine control to optimize the operating procedures for obtaining a better change response, by using the space vector pulse width modulation (SVPWM) to activate the generator stator current vector for achieving the control efficiency.

The integrate control strategy is introduced mainly on the connection of permanent magnetic synchronous generators (PMSG) in series or parallel patterns. Related to the reactive power at the same time, the maximum active power can be optimized by a point-tracking approaching at the DC side of converter for whole system. Various simulations and initial measurements are analyzed. The results indicate that influence to the electrical system is reduced during the wind speed fluctuation.

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LIST OF ABBREVIATION

PCC	Power Converter Circuit
WT	Wind Turbine
PF	Power Factor
VSI	Voltage Source Inventor
VSC	Voltage Source Control
GTO	Gate Turnoff Thyristor
IEGT	Injection Enhancement Gate Transistor
IGBT	Insulated Gate Bipolar Transistor
IGCT	Insulated Gate Commutated Thyristor
PMSG	Permanent Magnet Synchronous Motor
IM	Inductance Motor
PWM	Pulse Width Modulation
SVPWM	Space Vector Pulse Width Modulation
IPM	Intelligent Power Module
EMS	Energy Management System
DTC	Direct Torque Control
FFT	Fast Fourier Transformation

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