POZNAN UNIVERSITY OF TECHNOLOGY
FACULTY OF ELECTRICAL ENGINEERING

POLISH SOCIETY FOR THEORETICAL AND APPLIED ELECTRICAL ENGINEERING
POZNAŃ SECTION

In co-operation with
EPE - PEMC COUNCIL
and EUROPEAN POWER ELECTRONICS AND DRIVES ASSOCIATION

EPE – PEMC 2008

13th International Power Electronics and Motion Control Conference

ABSTRACTS

September 1 – 3, 2008, Poznań – Poland

machine), active and reactive power, direct power control of the line side converter, direct controls of both of the converters in a DC link inverter. The idea is the same for all of them and can be generalized. Looking deeper into the operation of the direct controls, some special effects can be found: different resulting error bands and switching frequency in different operation modes of the converter, large delay in reference tracking. These can badly affect the operation of the control: larger (not the expected) error, larger switching frequency, slower control. Methods are given against them: modified switching tables, increasing the number of sectors, selecting proper sector orientation.

Keywords: Direct power control, direct torque and flux control, Voltage Source Converter (VSC), windgenerator systems.

Session [D12] Dialog Session – Renewable Energy Sources
Date September 1, 2008 (Monday)

Paper ID: 139   [D12] ■

Multipolar Double Fed Induction Wind Generator with a Single Phase Secondary Winding

Leonids Ribickis[1], Guntis Dilevs[1,a], Nikolajs Levins[2] and Vladislavs Pugachevs[2]
[1] *Riga Technical University, Faculty of Power and Electrical Engineering, 1 Kalku Str., LV-1050, Riga, Latvia. E-mail: [a] guntis.dilevs@gmail.com*
[2] *Institute of Physical Power Engineering, 21 Aizkraukles Str., LV-1006, Riga, Latvia. E-mail: magneton@edi.lv*

The project concerns the practical applications of multipolar induction machines as generators for small and medium wind turbines. Such a multipolar generator should be built in a way that the primary and secondary windings are placed on the stator, and the rotor is tooth-like without windings, with each tooth equivalent to one pole pair. The most reliable design is that with a single-phase secondary winding, which provides efficient control of the generator.

Keywords: IEEEtran, double fed, induction generator, paper, multipolar.

Paper ID: 187   [D12] ■

The Measurement on the Solar Cells in Liberec City

Jiri Kubin
Technical University Liberec/Institute of Mechatronics and Computer Engineering, Liberec, Czech republic. E-mail: jiri.kubin@tul.cz

In the years 2005–2007 was realised the project "Pilot project of the power-produsing yield of the solar photovoltaic system in our climatic conditions for requirement of the supplying of the information and monitoring system of Liberec city". The project was solved at Technical University of Liberec (TUL) with the cooperation of High School for Electrotechnics and Mechanical Engineering in Liberec (SPŠSE). The project was financed by statutory city of Liberec. The paper deals with realisation of the project, measurements proceeding and some particular results.

Keywords: IEEEtran, solar cell system, renewable energy systéme, photovoltaic.

Paper ID: 217   [D12] ■

Rotor Turn-to-Turn Faults of Doubly-Fed Induction Generators in Wind Energy Plants — Modelling, Simulation and Detection –

Vincenz Dinkhauser[a] and Friedrich W. Fuchs[b]
Institute of Power Electronics and Electrical Drives, Christian-Albrechts-University of Kiel, Kaiserstr. 2, 24143 Kiel Germany. E-mail: [a] vvd@tf.uni-kiel.de, [b] fwf@tf.uni-kiel.de

This work considers the seldomly treated case of rotor turn-to-turn fault of a doubly-fed induction generator. This fault can take place where the doubly-fed induction generator is a standard solution in wind power stations. For investigations an error-adoptable three phase machine model is derived and simulated. Furthermore the model is integrated in a wind energy plant model and simulated for a turn-to-turn fault in one rotor phase. Motor current signature analysis, wavelet transformation and the Luenberger observer are used for detection and are compared.

Keywords: Diagnostics, doubly-fed induction machine, fault handling strategy, wind energy, simulation.

Paper ID: 286   [D12] ■

Static and Dynamic Response of a Photovoltaic Characteristics Simulator

Anastasios Ch. Nanakos[a] and Emmanuel C. Tatakis[b]
University of Patras, Department of Electrical and Computer Engineering, Laboratory of Electromechanical Energy Conversion, Rion - Patras, Greece. E-mail: [a] tnanakos@ece.upatras.gr, [b] e.c.tatakis@ece.upatras.gr

In this paper a simulator of photovoltaic generators with programmable electrical characteristics is presented. The proposed system has the ability to generate the current-voltage curves of photovoltaic modules under any desirable insolation and temperature conditions. The system is also capable of integrating any maximum power point tracking algorithm under a unified control. The simulator's aim is the introduction of a faster, spherical and more effective approach in experimental investigation of photovoltaic systems, either in standalone or grid connected applications, independently from the atmospheric conditions. Towards this aim, the use of a DC power supply, controlled through a data acquisition card by appropriate algorithms, is proposed. These algorithms are implemented on a personal computer. Special effort was given in the development of a simplified user interface that monitors and controls the entire system offering effortless and faster conclusions.

Keywords: Photovoltaic, solar cell system, renewable energy systems, simulation, virtual instrument.