

NORPIE/2008

Nordic Workshop on Power and Industrial Electronics

Workshop Program

June 9–11, 2008

Helsinki University of Technology

**Faculty of Electronics, Communications and Automation
Espoo, Finland**

Lecture Hall S1 (Street Address: Otakaari 5 A)

Monday, June 9, 2008

09:40 – 10:00 Registration and coffee

10:00 – 10:20 Opening the workshop

10:20 – 12:00 Session: Wind power

Session Chair: Prof. Jorma Kyrrä

Keynote presentation: Recent trends in variable speed wind turbine drives

Jouko Niiranen

ABB Oy, Finland

Variable speed pumped storage hydropower for integration of wind energy in isolated grids – case description and control strategies (16)

Jon Are Suul¹, Kjetil Uhlen², Tore Undeland¹

¹ *Department of Electrical Power Engineering, Norwegian University of Science and Technology, Trondheim, Norway*

² *SINTEF Energy Research, Trondheim, Norway*

Power collection and integration on the electric grid from offshore wind parks (22)

Anne Berit Mogstad, Marta Molinas

Department of Electric Power Engineering, Norwegian University of Science and Technology, Trondheim, Norway

12:00 – 13:20 Lunch

13:20 – 14:40 Session: Industrial applications

Session Chair: Prof. Jorma Luomi

Design of master control unit for laboratory prototype of traction converter for locomotives (12)

Jan Žák¹, Zdeněk Peroutka¹, Seppo J. Ovaska²

¹ *University of West Bohemia, Czech Republic*

² *Faculty of Electronics, Communications and Automation, Helsinki University of Technology, Finland*

Reference signal generator for active power filters using MGP-FIR filter designed by evolutionary programming (10)

Tomáš Komrská¹, Seppo J. Ovaska²

¹ *Department of Electromechanics and Power Electronics, Faculty of Electrical Engineering, University of West Bohemia in Pilsen, Czech Republic*

² *Faculty of Electronics, Communications and Automation, Helsinki University of Technology, Finland*

Designing maximum length sequence signal for frequency response measurement of switched mode converters (4)

Matti Vilkkö, Tomi Roinila

Tampere University of Technology, Finland

Project presentation: Magnetic energy recovery switch (MERS) implemented as light dimmer

Olav Fønstelién, Marta Molinas, Tore Undeland
Norwegian University of Science and Technology, Trondheim, Norway

14:40 – 15:00 Coffee

15:00 – 16:20 Session: Converters

Session Chair: Prof. Tore Undeland

Current-sourced buck converter (14)

Jari Leppäaho¹, Matti Karppanen¹, Teuvo Suntio²

¹ *Electrical Energy Engineering Department, Tampere University of Technology, Finland*

² *Electrical Engineering Department, Tampere University of Technology, Finland*

Insertion loss and network parameters in the analysis of power filters (36)

Konstantin S. Kostov, Jorma J. Kyyrä

Department of Electrical Engineering, Helsinki University of Technology, Finland

High frequency winding design for planar switch mode transformers (25)

André Büttner¹, Arne Nysveen¹, Magnar Hernes²

¹ *Department of Electrical Power Engineering, Norwegian University of Science and Technology, Trondheim, Norway*

² *SINTEF Energy Research, Trondheim, Norway*

Project presentation: EMI reduction using symmetrical switching and capacitor control

Julia Paixão¹, Andreas Karvonen¹, Johan Åström¹, Trygve Tuveson², Torbjörn Thiringer¹

¹ *Chalmers University of Technology, Sweden*

² *EMC Services Elmiljöteknik AB*

17:30 Informal Dinner at the High-Voltage Hall (close to Lecture Hall S5)

Tuesday, June 10, 2008

09:00 – 10:20 Session: Power systems

Session Chair: Prof. Marta Molinas

A LVDC distribution system concept (2)

Pasi Salonen, Tero Kaipia, Pasi Nuutinen, Pasi Peltoniemi, Jarmo Partanen
Lappeenranta University of Technology, Finland

Customer-end inverter in an LVDC distribution network (1)

Pasi Nuutinen, Pasi Salonen, Pasi Peltoniemi, Pertti Silventoinen
Lappeenranta University of Technology, Finland

Control principles for blackstart and island operation of microgrid (6)

Hannu Laaksonen, Kimmo Kauhaniemi
University of Vaasa, Finland

Dynamic modeling of thyristor controlled series capacitor in PSCAD and RTDS environments (19)

Pasi Vuorenpää¹, Pertti Järventausta¹, Jari Lavapuro²

¹ *Department of Electrical Energy Engineering, Tampere University of Technology, Finland*

² *Areva Ltd., Tampere, Finland*

10:20 – 10:40 Coffee

10:40 – 12:00 Session: Control methods

Session Chair: Prof. Seppo Ovaska

StatCom with capacitive energy storage for compensation of cyclic loads (23)

Hailian Xie¹, Lennart Ängquist², Hans-Peter Nee³

¹ *School of Electrical Engineering, Royal Institute of Technology, Stockholm, Sweden*

² *ABB, Västerås, Sweden and Royal Institute of Technology, Stockholm, Sweden*

³ *Royal Institute of Technology, Stockholm, Sweden*

Grid inductance estimation by reactive power perturbation for sensor-less scheme based on virtual flux (32)

Arkadiusz Kulka, Tore Undeland

Department of Electrical Power Engineering, Norwegian University of Science and Technology, Trondheim, Norway

Understanding of tuning techniques of converter controllers for VSC-HVDC (29)

Chandra Bajracharya, Marta Molinas, Jon Are Suul, Tore M. Undeland
Norwegian University of Science and Technology, Trondheim, Norway

Active control of radial rotor vibrations in electric machines – identification, modeling and control design (5)

Juha Orivuori¹, Antti Laiho², Anssi Sinervo³

¹ *Department of Automation and Systems Technology, Helsinki University of Technology, Finland*

² *VTT, Technical Research Centre of Finland*

³ *Department of Electrical Engineering, Helsinki University of Technology, Finland*

12:00 – 13:20 Lunch

13:20 – 14:40 Session: Wind power and photovoltaics

Session Chair: Prof. Teuvo Suntio

Multi-terminal VSC-HVDC system for integration of offshore wind farms and green electrification of platforms in the North Sea (26)

Temesgen M. Haileselassie, Marta Molinas, Tore Undeland

Department of Electric Power Engineering, Norwegian University of Science and Technology, Norway

Wind turbine and grid interaction studies using integrated real-time simulation environment (21)

Anssi Mäkinen, Heikki Tuusa

Department of Electrical Energy Engineering, Tampere University of Technology, Finland

Selecting the accurate solar panel simulation model (15)

Krisztina Leban, Ewen Ritchie

Aalborg University, Denmark

Grid connected converters for photovoltaic, state of the art, ideas for improvement of transformerless inverters (27)

Fritz Schimpf, Lars E. Norum

Department of Electrical Power Engineering, Norwegian University of Science and Technology, Trondheim, Norway

14:40 – 15:00 Coffee

15:00 – 16:20 Session: Electric machines and drives

Session Chair: Prof. Ewen Ritchie

Optimum supply for an inverter-fed cage induction motor at different load conditions (28)

M. Jahirul Islam, Antero Arkkio

Department of Electrical Engineering, Helsinki University of Technology, Finland

A discussion about a start-up procedure of a doubly-fed induction generator system (31)

J. L. Da Silva¹, R. G. de Oliveira¹, S. R. Silva¹, B. Rabelo², W. Hofmann²

¹ *Federal University of Minas Gerais, Electric Engineering Research and Development Center, Belo Horizonte, Brazil*

² *Dresden University of Technology, Department of Electrical Machines and Drives, Dresden, Germany*

Small-signal analysis of a saturated induction motor (34)

Mikaela Ranta, Marko Hinkkanen, Anna-Kaisa Repo, Jorma Luomi

Department of Electrical Engineering, Helsinki University of Technology, Finland

Functional simulations of power electronics components in series-hybrid machinery for the needs of OEM (35)

Matti Liukkonen¹, Ari Hentunen¹, Jussi Suomela², Jorma Kyyrä¹

¹ *Department of Electrical Engineering, Helsinki University of Technology, Finland*

² *Department of Automation and Systems, Helsinki University of Technology, Finland*

16:20 – 16:40 Closing of the workshop

19:00 Gala dinner at Dipoli

Wednesday, June 11, 2008

Industrial tour

ABB Marine Solutions and the new factory in Vuosaari in Helsinki

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| 9:15 | Departure from Radisson SAS, Otaniemi |
| 10:00 | Arrival at ABB Marine, Vuosaari |
| 10:00 – 12:00 | Presentation of ABB Marine Business and electric propulsion, factory tour |
| 12:00 – 13:00 | Lunch |
| 13:00 | Departure from Vuosaari |
| 13:30 | Arrival at Radisson SAS, Otaniemi |