

Opening of the Conference 9.00 am

KEY-NOTE Paper (PC, IM and PQ participants)
9.15 am - 9.55 am

Chairman: Ted Hopper, MACCON, GERMANY

- K 1 POWER SYSTEMS AND EVOLUTION FACTORS - FROM THE STATE-OF-THE-ART TO FUTURE TRENDS**
M. Jufer, EPFL, SWITZERLAND
- Power electronic systems and electric drives are often considered as out-of-date techniques, no more evolving. As most techniques, electrotechnics would disappear without evolution. Many factors influence this evolution and will be developed:
- the demand ; when the electric power system becomes the weakest point in a machine, it becomes automatically the key factor for the performances;
 - the electronic components;
 - the control systems and devices;
 - the communication systems;
 - the materials (ferrites, permanent magnets);
 - the design optimization according to the applications
 - the integration of the power system components and the integration into the global systems.
- An example in the field of contactless energy transmission for electric vehicles will illustrate this presentation.

Session PQ 1

UPS AND POWER QUALITY ANALYSIS
10.00 am - 12.05 pm

Chairman: T. Sezi, Siemens PQ, GERMANY

- PQ 1.1 APPLICATIONS OF A FLYWHEEL STORAGE SYSTEM**
H. Darrelmann, Piller, GERMANY
- PQ 1.2 A NOVEL LIGHTWEIGHT AND COMPACT ON-LINE UPS ENGINE-GENERATOR SYSTEM**
F. Caricchi, University of Rome „La Sapienza“, F. Crescimbin, L. Solero, University „Roma Tre“, ITALY
- PQ 1.3 A NEW INNOVATIVE THREE PHASE UPS BASED ON SIX-PACK COMPONENTS AND A NEW COOLING SYSTEM**
S. Bernard, G. Besset, J.-L. Bonnet-Massimbert, MGE UPS SYSTEMS, FRANCE
- PQ 1.4 PC BASED POWER NETWORK QUALITY ANALYSER - FIVE INDEPENDENT VIRTUAL ANALYSER IN ONE INSTRUMENT INCLUDING POST PROCESSING**
D. Kaminsky, J. Zidek, VSB - Technical University Ostrava, CZECH REPUBLIC
- PQ 1.5 IS DIGITAL FLICKER MEASUREMENT REALLY A PROBLEM?**
W. Mühlegger, LEM, SWITZERLAND

Dialogue Sessions for all participants in front of the conference rooms

Time for lunch and visiting the exhibition

Session PQ 2

HIGH - POWER POWER FACTOR CORRECTION, ACTIVE FILTERS
3.30 pm - 6.00 pm

Chairman: J.W. Kolar, TU Vienna, AUSTRIA

- PQ 2.1 SIMULATION OF ELECTRICAL ARC FURNACE WITH NEW CONVERTER TOPOLOGY**
C. Bas, P. Ladoux, H. Foch, Laboratoire d'Electrotechnique et d'Electronique Industrielle, J. Nuns, Electricité De France, FRANCE
- PQ 2.2 A 12-PULSE DIODE RECTIFIER USING 3-PHASE BRIDGE 6-PULSE DIODE RECTIFIER WITH 2 ADDITIONAL DIODES AND AN AUTO-TRANSFER**
Y. Nishida, Nihon University, JAPAN
- PQ 2.3 LINE-SIDE INTERPHASE REACTOR-COUPLED THREE-PHASE DIODE RECTIFIER SYSTEM WITH 24-STEP INPUT VOLTAGES**
K. Oguchi, K. Inaoka, N. Hoshi, T. Kubota, Ibaraki University, JAPAN
- PQ 2.4 PRINCIPLES OF INSTANTANEOUS COMPENSATION IN THREE-PHASE CIRCUITS WITH ACTIVE POWER FILTERS**
J.-C. Montano, Institutio de Recursos Naturales y Agrobiologia de Sevilla, P. Salmerón, Universidad de Huelva, SPAIN
- PQ 2.5 A NEW CONTROL SCHEME FOR HARMONIC AND REACTIVE POWER COMPENSATION IN THREE PHASE SYSTEMS**
P. Singh, Central Electronics Engineering Research Institute, C.M. Bhatia, Indian Institute of Technology Delhi, INDIA, J.M. Pacas, University of Siegen, GERMANY
- PQ 2.6 ACTIVE HARMONIC FILTERS: APPLICATION POTENTIAL BEYOND HARMONICS**
J.R. Johnson, D.A. Marckx, Electronic Power Conditioning, USA

KEY-NOTE Paper (PC, IM and PQ participants) 8.30 am - 9.10 am

Chairman: Thierry Meynard, ENSEEIHT, FRANCE

K 2 PROPERTIES AND APPLICATIONS OF SUPERCAPACITORS - FROM THE STATE-OF-THE-ART TO FUTURE TRENDS

A. Schneuwly, R. Gallay, montena components SA, SWITZERLAND

Electrochemical double-layer capacitors, also known as supercapacitors or ultracapacitors, are electrical storage devices, which have a relatively high energy storage density simultaneously with a high power density. Recent developments in basic technology, materials and manufacturability have made supercapacitors an imperative tool for short-term energy storage in power electronics. With much higher energy density than today's capacitors and none of the problems associated with conventional battery technology, supercapacitors give an access to new power electronic and industrial storage applications.

The paper presents basic supercapacitor technology, component specific properties as well as state-of-the art products applications. The problematic nature of capacitors series connection for higher voltage applications is touched on. The review also deals with an energy storage system, which is based on the hybridization of rechargeable batteries and supercapacitors, with a suitable designed electronic interfacing arrangement in order to obtain a very high energy density device with a high power performance and a long lifetime. Finally, an overview over future trends regarding the supercapacitor technology as well as application scenarios, mainly in the tradition domaine, is given.

Session PQ 3

ACTIVE FILTERS 9.15 am - 11.45 am

Chairman: M. Grötzbach, University of Federal Defence Munich, GERMANY

PQ 3.1 ANALYSIS OF OPERATION FOR THE COMBINED FILTERING SYSTEM CONSISTING OF PASSIVE FILTER WITH CAPACITORS IN PARALLEL WITH DIODE
D. Alexa, A. Lazar, So. Gradinaru, Sa. Gradinaru, Electronics Faculty of the Technical University of Iasi, E. Rosu, University „Dunarea de Jos“ of Galati, ROMANIA, J. P. Six, Université des Sciences et Technologies de Lille, FRANCE

PQ 3.2 VOLTAGE SAG AND SWELL MITIGATION USING A STATIC SERIES COMPENSATION DEVICE
T. Sezi, N.H. Woodley, Siemens PQ, GERMANY

PQ 3.3 STATIC POWER QUALITY IMPROVEMENT METHODS
T. Sezi, N.H. Woodley, Siemens PQ, GERMANY

PQ 3.4 SOLVING SUPPLY AND LOAD IMPERFECTIONS USING UNIVERSAL POWER QUALITY CONDITIONING SYSTEM
D. Graovac, V. Katic, University of Novid Sad, YUGOSLAVIA, A. Rufer, Ecole Polytechnique Federal de Lausanne, SWITZERLAND

PQ 3.5 CONTROL DESIGN OF AN ACTIVE CONDITIONER FOR THREE-PHASE LOAD COMPENSATION

J. Prieto, P.R. Salmerón, Huelva University, SPAIN

PQ 3.6 CONTROL OF ACTIVE FILTERS FOR COMPENSATION OF REACTIVE POWER AND CURRENT HARMONICS

J.H. Carstens, D. Schulz, M. Stiebler, R. Hanitsch, Berlin University of Technology, GERMANY

Dialogue Sessions for all participants in front of the conference rooms

Time for lunch and visiting the exhibition

Session PQ 4

HARMONICS, FLICKER, FAULT PROTECTION 3.00 pm - 6.00 pm

Chairman: J. P. Beaudet, MGE UPS, FRANCE

PQ 4.1 HARMONIC DISTORTIONS OF AC/DC CONVERTERS UNDER UNBALANCED VOLTAGE SUPPLY

M. Bauta, Thüga, M. Grötzbach, University of Federal Defence Munich, GERMANY

PQ 4.2 FUNCTIONAL SENSITIVITY OF LOW VOLTAGE CONSUMERS ON VOLTAGE DIPS

G. Brauner, Vienna University of Technology, AUSTRIA

PQ 4.3 UNIVERSAL ANALYSIS AND PROGNOSIS OF FLICKER IN DISTRIBUTION NETWORKS

C. Hennerbichler, G. Brauner, Vienna University of Technology, AUSTRIA

PQ 4.4 DISTORTION ANALYSIS IN AC / DC RECTIFIERS OPERATING IN DISCONTINUOUS MODE UNDER UNBALANCED CONDITIONS

J.M. Cano, G.A. Orcajo, M.F. Cabanas, M.G. Melero, Universidad de Oviedo, J.G. Mayordomo, Universidad Politécnica de Madrid, SPAIN

PQ 4.5 MODULATED LAPPED TRANSFORMS FILTER BANK TECHNIQUE APPLICATION FOR AC / DC CONVERTER POWER QUALITY ANALYSIS

J. Knezevic, V. Katic, Z. Trpovski, D. Graovac, University of Novi Sad, YUGOSLAVIA

PQ 4.6 A TIME DOMAINE TRANSFORMER MODEL BASED ON FREQUENCY DOMAINE MEASUREMENTS FOR THE SIMULATION OF FAST TRANSIENTS IN POWER SYSTEMS

W. Hribernik, Technical University of Vienna, AUSTRIA

PQ 4.7 COMPENSATION OF EARTH FAULT CURRENTS IN SHIP IT-TYPE NETWORKS

J. Hryniewicz, S. German-Galkin, Maritime University Szczecin, POLAND

GET - TOGETHER - PARTY
for all conference participants and exhibitors,
Exhibition Hall 12
6.00 pm - approx. 8.30 pm

KEY-NOTE Paper (PC, IM and PQ participants)

8.30 am - 9.10 am

Chairman: Franz Zach, Technical University Vienna, AUSTRIA

K 3 FACTS IN THE LIBERALIZED MARKET - FROM THE STATE-OF-THE-ART TO FUTURE TRENDS

G. Brauner, Vienna University of Technology, AUSTRIA

Liberalization in the electricity supply utilities has led to a bundling into transmission, distribution, generation and energy trade. The transmission and distribution networks are forced to gain their money by transit tariffs.

Due to the need for economic efficiency in the future, there will be lower investments into the transmission and distribution networks. Together with generation scheduling mainly due to the market rules but not to technical needs, the available transmission capacity will decrease. For maintaining a sufficient margin of available transmission capacity will decrease.

For maintaining a sufficient margin of available transmission systems systems in future, there will be an increased use of FACTS in form of SVC (Statistic Voltage Group) and UPFC (Universal Power Flow Controller). Both are shown in their technical principles.

For real transmission, their application will be shown and possible improvements in available transmission capacity and power quality is compared.

Session PQ 5

SUPER CAPACITORS, WIND AND SOLAR ENERGY

9.15 am - 11.45 am

Chairman: H. Darrelmann, Piller, GERMANY

PQ 5.1 EQUALISING THE VOLTAGES IN A SERIES CONNECTION OF SUPERCAPACITORS WITH ACTIVE DEVICE

P. Barrade, S. Pittet, A. Rufer, Laboratoire d'Electronique Industrielle Lausanne, SWITZERLAND

PQ 5.2 APPLICATIONS WITH PROTON EXCHANGE MEMBRANE (PEM) FUEL CELLS FOR A DEREGULATED MARKET PLACE

B. Kohlstruck, Alstom Ballard, GERMANY

PQ 5.3 MODELLING AND DIGITAL SIMULATION OF A WIND ELECTRIC POWER SYSTEM

L. Modran, Universitatea „L. Blaga“, ROMANIA, S. Heier, Universität Gesamthochschule Kassel, GERMANY

PQ 5.4 FUZZY LOGIC CONTROL SCHEME FOR MAINS SYNCHRONIZED SOLAR-ELECTRICAL ENERGY CONVERSION

H. Bülent Ertan, K. Leblebicioglu, Middle East Technical University, M. Özemener, Tubitak, TURKEY, O. Bulatov, Moscow Power Eng. Inst., RUSSIA

PQ 5.5 POWER QUALITY PARAMETERS OF A GRID CONNECTED SOLAR INVERTER

D. Schulz, R. Hanitsch, Berlin University of Technology, GERMANY

PQ 5.6 A HIGH EFFICIENT VOLTAGE REGULATED DC/DC CONVERTER - THE CENTRAL COMPONENT FOR MODULAR PHOTOVOLTAIC AND WIND POWER PLANTS

R. Mecke, U. Riefenstahl, Otto-von-Guericke Universität Magdeburg, GERMANY

Dialogue Sessions for all participants in front of the conference rooms

Time for lunch and visiting the exhibition

Session PQ 6

WIND AND SOLAR ENERGY 2.30 pm - 4.10 pm

Chairman: P. Bastard, SUPELEC, FRANCE

PQ 6.1 EXPERIMENTAL RESULTS OF A 100 kW CURRENT-SOURCE PWM-CONVERTER OPERATION WITH A MULTIPOLE PERMANENT MAGNET SYNCHRONOUS GENERATOR FOR A VARIABLE SPEED WIND ENERGY DRIVE

P. Puttonen, M. Salo, H. Tuusa, Tampere University of Technology, FINLAND

PQ 6.2 IMPROVED DC TO DC CONVERTER FOR SOLAR APPLICATIONS

K.H. Edelmoser, Technical University of Vienna, AUSTRIA

PQ 6.3 750 kW WIND POWER CONVERTER IN 3,3 kV IGBT TECHNOLOGY

P. Lautier, Arcel Electronique, FRANCE, H. Rüedi, CT-Concept Technologie, SWITZERLAND

PQ 6.4 A NEW APPROACH TO ACTIVE COMPENSATION OF LEAKAGE CURRENTS IN A LOW VOLTAGE INSULATED NEUTRAL SHIP NETWORK

L. Dorobczynski, M. Wierzejski, Maritime Academy of Szczecin, POLAND