**Background and scope**

Electric power systems are subjected to a wide range of transient disturbances, which impact its overall performance. It is a challenge to build and operate power systems so that the safety of individual equipment, the security of the integrated power system and the quality of power supply are not unduly compromised.

The general purpose of the symposium is to provide a forum for discussing the nature of transient phenomena in present-day electric power systems and how these systems need to be designed to ensure a secure and robust service.

**Participants**

The Symposium is directed towards utilities, equipment manufacturers, design engineers, system operators, traders, regulators as well as universities, testing laboratories and research institutes. It should also be of interest to other organizations in the Electricity Industry.

**Topics**

The symposium comprises 10 sessions as described in the time-table hereafter. Each session will start with a presentation of the papers by their author, followed by a discussion. The topics addressed are as follow:

- Transient phenomena, insulation coordination
- Computation
- Lightning
- Transients and equipment
- EMC
- Modelisation
- Measurements
- Wind power
- Blackout control
- Power quality

**Wednesday, 18th April**

7.00 p.m. Welcome Cocktail

**Thursday, 19th April**

9.00 a.m. – 11.00 a.m. Opening Ceremony
Keynote address – C.A. Nucci
Invited Speakers – P. Kundur, I. Toljan, H. Dommel

11.30 a.m. – 1.30 p.m. Session I & Session VI
3.00 p.m. – 5.00 p.m. Session II & Session VII

**Friday, 20th April**

9.00 a.m. – 11.00 a.m. Session III & Session VIII
11.30 a.m. – 1.30 p.m. Session IV & Session IX
3.00 p.m. – 5.00 p.m. Session V & Session X
5.30 p.m. – 6.30 p.m. Closing Session
8.30 p.m. Official Dinner

**Saturday 21th April**

8.00 a.m. – 7.00 p.m. Technical/Tourist Tours

3 tutorials will take place, before the Symposium (see on the CIGRE website):

17 April : 09.00 – 12.30 Electromagnetic Transients in power systems, Hermann Dommel, Ante Sekso Talento
17 April : 03.00 – 06.30 Power system security : challenges in the New Industry Environment, Recent Experiences and Solutions, Prabha Kundur
18 April : 03.00 – 06.30 Lightning protection of power distribution and transmission systems, Carlo Alberto Nucci, Ivo Ugljesic
Technological Program

I. Transient Phenomena, Insulation Coordination

Thursday, 19th April
(11.30 am - 1.30 pm room A)

Chairman: A. Sekso

001 Travelling wave - based relay protection schemes for improved power system performance
L. A. Kojojic, J. Esztergalyos

002 Mitigation of common mode failures at multi-circuit line configurations by application of line arresters against back flashovers
M. Kizilcay, C. Neumann

003 Discussion on the interaction between transformers and the power systems
G. Saricelli Luz

004 Developments on the line surge arresters application guide
A. Xelard, S. Sadovic, I. Ugesic, J.A. Martinez, L. Prikler

005 Practice and tendencies in "insulation coordination" in transmission networks in Europe and in the world
A. Sekso Telento

006 Some peculiarities in insulation coordination and mitigation measures against extreme sea salt pollution on Croatian 110 Kv "Islands connection"
D. Mihalic, J. Šmunić, A. Sekso Telento

II. Modelisation

Thursday, 19th April
(3.00 pm - 5.00 pm room A)

Chairman: Z. Majkovic

001 An EMTP extension for computing earthing system transient step and touch voltages
S. Vujević, P. Sarajčev

002 Transients caused by sequential circuit breaker tripping issued by busbar protection
I. Uglešić, I. Ivaniković, V. Milaric

003 Analysis of single-pole auto-reclosing requirements on 500kV transmission lines using the dynamic arc model
Z. Osarin, S. Yusof, A. Razib Dawood, A. Musa, G. Irwin

004 CEMIG experience in the analysis of transient recovery voltages associated with transformer-fed faults.
A. C.O. Rocha, S. O. Moreira, L. H.S. Duarte

005 Structure-preserving dynamic equivalents for large-scale power systems using border synchrony
B. Mallem, B. Maritenscu, L. Rouco

006 Oscillatory stability analysis of a power system over a large set of operating conditions
J.C. Pino, R. Ramirez, D. Ciriö, E. Gaglioti

III. Computation

Friday, 20th April
(9.00 am - 11.00 am room A)

Chairman: R. Joho

001 Impact of energy storage on system performance under fault conditions
H. Xie, L. Ångquist, H-P Nee

002 Numerical analysis of power system electromechanical and electromagnetic transients based on the finite element technique
I. Jurić-Grgić, M. Kurtović, R. Lucić

003 Influence of the secondary arc on the operation of single phase auto-reclosure of the 400 kV interconnection between Hungary and Croatia
G. Bán, L. Prikler, A. Tombor, G. Tari, J. Zerényi, M. Kizilcay

VI. Wind Power

Thursday, 19th April
(11.30 am - 1.30 pm room B)

Chairman: C. Ray

0601 Analysis of influence of the connection of the wind farm Ravna 1 to the Croatian power system
T. Drolulić, K. Meštrović, D. Petranović

0602 System studies of voltage drops caused by energising MV wind turbine transformers
T. Ma

0603 Power quality analysis of MV distribution system before connection of the wind farm
J. Šimić, M. Lasić, S. Gros

0604 Detailed transients simulations of a doubly fed induction generator wind turbine system with the EMTP-type OVNI simulator
M. L. Armstrong, J. R. Marti, P. Kundur

0605 Wind generation issue in Spain and real time production control
T. Dominguez, E. Prieto, G. Juberías, M. de la Torre, A. Córdoa

0606 Effect of wind energy on the power system inertial response and frequency control
T. About-Seoud

VII. Transients and Equipment

Thursday, 19th April
(3.00 pm - 5.00 pm room B)

Chairman: M. Saravolac

0701 Dielectric, switching and system requirements under out-of-phase conditions, during synchronisation and under comparable stresses.

0702 Overvoltages at vacuum switching devices operation
P. Vukelja, J. Mrvic, D. Hrvic

0703 Optimizing electric parameters and operation range of hydro-generator in refurbishing
K. Celić, S. Berberović, M. Pužar

0704 The impact of ferroresonance and low frequency phenomena on power transformers and transmission systems
M. Osborne, P. Jarman, C. Charalambous, Z. Wang

0705 Significance of frequency response analysis in condition state monitoring of power transformers with applications in improvements of overvoltage protection
I. Dolić, S. Bojić, J. Topić, A. Sekso Telento

0706 Controlled energizing of three-phase transformer : analysis of test results
H. S. Bronzeado, S. O. Pinto, P. Jonsson, J.C. de Oliveira, M.L.R. Chaves

VIII. Blackout-control

Friday, 20th April
(9.00 am - 11.00 am room B)

Chairman: P. Kundur

(asistant : Mrs. M. Armstrong)

0801 Prevention of major disturbances: proposal of a methodology and its implementation in the Portuguese transmission grid
M. Matos Fernandez, L. Lima Perro, A. C. Reis Rodrigues

0802 CANCELLED Voltage and angle stability monitoring: possible approaches in the framework of a wide area measurements system (WAMS)
C. Candia, A. Danelli, G. Giannuzzi, M. Pozzi, R. Salvati, R. Zaottini

0803 CANCELLED - Design criteria for a load-shedding scheme: an extensive simulation approach in a Dynamic Security Assessment (DSA) environment
M. Cignatta, A. Danelli, M. Salvetti, M. Pozzi, R. Salvati, R. Zaottini
Power quality problems due to transformer inrush current
A. Tokić, I. Uglešić

Starts from dark - feasible scenarios
L. Kocia, K. Witner

Overvoltage due to capacitor banks switching in a 12 kV system
N. Chatranont, T. Meananeatra

IV. Measurements
Friday, 20th April
(11.30 am - 1.30 pm room A)
Chairman: N. Jaman
(assistant : S. Bojic)

0401 CANCELLED - On site measurements of switching overvoltages in hydro power plant Zakucac
K. Meštrović, M. Poljak, R. Gardijan, J. Šimić

0402 CANCELLED - Overvoltages on short high-voltage overhead lines
P. Vukušić, J. Mrvić, D. Hrvic

0403 Measurement and simulation of hydro-generator’s asynchronous operation
Z. Maljković, Ž. Zebić, M. Pavlica

0404 Wireless digital data acquisition system for the measurement of high frequency transients in power substations
W.H Siew, Y. Wang, M. Faheem, B. Musa, K. Liu

0405 Measurement of the switching over-voltages at the disconnection of the high voltage shunt reactors in the Romanian power system
P. Stroica, D. Stefan

V. Lightning
Friday, 20th April
(3.00 am - 5.00 pm room A)
Chairman: A. Janssen

0501 Economic positioning of line lightning arresters based on observation and analysis of lightning surges
A. Halim Abu Bakar, M. Ridzal Othman, H. Osman

0502 Performance of medium voltage overhead distribution lines against lightning discharges

0503 Modelling guidelines for overhead transmission lines in lightning studies
J. A. Martinez-Velasco, F. Castro-Aranda

0504 Models to transformers windings for lightning surges - testing and simulation results
C. de Salles, M. L.B. Martinez

0505 A method for the assessment of the indirect lightning performance of distribution networks
A. Borghetti, C.A. Nucci, M. Paolone

0506 Use of high resolution flash density maps in evaluation of lightning exposure of the transmission lines
J. Kosmač, S. Vizintin, V. Džunjica

The final order of the Papers within the sessions will be decided by the respective session chairmen

Lunches are on one’s own. One coffee break between the morning sessions.

IX. EMC
Friday, 20th April
(11.30 am - 1.30 pm room B)
Chairman: K. Mestrovic
(assistant : J. Simic)

0901 Electromagnetic interference on measuring equipments of HV substation due to switching
B. Vahidi, Sh. Farokhi

0902 On certain experience with a power line communication system
P. Valozić

0903 Solving EMC problems in the design of new HV test laboratory
I. Uglešić, M. Ktepela, V. Miliardić

0904 Developing limits for controlling disturbances produced by large installations connected to power systems
G. Beaulieu, R. Koch, M. Halpin, L. Berthet, P. Goossens

0905 Mitigation techniques of electromagnetic interference due to disconnector switching in air-insulated substations
S. Carsimamovic, Z. Bajramovic, M. Veledar, M. Ljevak, A. Carsimamovic, P. Osakrovic

0906 Electromagnetic compatibility in various kinds of substations in Croatian transmission networks and mitigation measures
S. Bojić, A. Sekso Telento, I. Dolić

0907 Criteria of effectiveness for EMC mitigation techniques within HV substations
T. Živic

0908 Novel earth electrodes in substations for improved electromagnetic compatibility (EMC)
P.H. Pretorius, A.C. Britten, K.R. Hubbard, M.E. Mathebula

X. Power quality
Friday, 20th April
(3.00 pm - 5.00 am room B)
Chairman: M. Zeljko

1001 Voltage dip immunity of equipment in installations, scope and status of the work

1002 Voltage support transformer improves power quality during power system transients
L. A. Kojovic

1003 Modelling guidelines and solution techniques for voltage dip prediction
J.A. Martinez-Velasco

1004 CANCELLED - Power quality indices for transient disturbances for systems with grid connected wind plants
A. Bracale, G. Carpinelli, A. Russo, P. Verde

1005 The impact of events in the Slovene high-voltage network on the power quality in the distribution networks
K. Deželak, A. Korak, T. Konjić, G. Stumberger, J. Voršič

1006 Evaluation of different methods for voltage sag source detection
B. Polažer, G. Stumberger, S. Seme

1007 Fault location and characterizing voltage sags from limited measurements on a transmission system
M. McGranaghan, R. Dungan, D. Sabin, F. Elmendorf
Registrations

The Symposium is open to all. Registrations can be made in advance using the registration form and also on arrival to the Symposium. Early registration means early delivery of your conference documents.

The registration fees cover:

- Attendance and participation in discussion meetings (sessions and tutorials)
- The CD-ROM of papers (forwarded to delegates by air-mail) if payment is received before March 20th, and available at the Croatian NC.
- Participation in the welcome cocktail and official dinner,
- Coffee breaks,
- The city tour of Zagreb planned on Thursday 19th.
- The technical/tourist visit to National Park Plitvice Lakes and Smiljan (birthplace of Nikola Tesla) planned on Saturday 21st.

Late registrants will be able to collect their CD-ROM of papers on arrival at the Symposium.

Optional tourist visits during the Symposium for accompanying persons and also after the Symposium for attendees will be organized against payment (see on accommodation form on website).

Hotel Reservations

Rooms will be available for delegates at the Symposium Headquarters, and in neighbouring hotels.

The corresponding hotel form is available on website and from National Committees.

Payment of fees

All attendees at meetings are expected to pay the full registration fees (including authors of papers).

Registration form and corresponding registration fees should be sent directly to:

UNIGLOBE PARTNER TRAVEL
Ul. A. Hebranga 9
HR – 10000 ZAGREB
Fax. +385 1 487 81 77
ivujic@uniglobetravel.hr

Payment is accepted by Bank remittance till April 1st only, and Credit Card (MasterCard, Visa, Diners, American Express).

Registrations will be accepted during the Symposium. The fees should be paid on arrival.

Cancellations

Cancellations received by April 1st will be refunded in full except the administrative fee of 50 €.

Cancellation fees received after April 1st will not be refunded.

Technical Organizing Committee

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