

2009 IEEE Bucharest PowerTech

**Bucharest, Romania
28 June – 2 July 2009**

Pages 1-674



**IEEE Catalog Number: CFP09815-PRT
ISBN: 978-1-4244-2234-0**

TABLE OF CONTENTS

INTEGRATION OF DISTRIBUTED GENERATION I

Simulation of Microturbine Generation System Performance during Grid Faults under new Grid Code Requirements	1
<i>M. Z. C. Wanik, I. Erlich</i>	
Potential of Improved Wind Integration by Dynamic Thermal Rating of Overhead Lines	9
<i>T. Ringelband, M. Lange, M. Dietrich, H-J. Haubrich</i>	
Dynamic Equivalent Model of Distribution Network Cell Using Prony Analysis and Nonlinear Least Square Optimization	14
<i>S. M. Zali, J. V. Milanović</i>	
Experimental Test of Seven Widely-Adopted MPPT Algorithms	20
<i>M. Berrera, A. Dolara, R. Faranda, S. Leva</i>	
Preventing Delayed Voltage Recovery with Voltage-Regulating Distributed Energy Resources	28
<i>S. Adhikari, F. Li, H. Li, Y. Xu, J. D. Kueck, D. T. Rizy</i>	
A Method for Cost Minimization Applicable to Load Centers Containing Distributed Generation	34
<i>C. V. Zeljkovic, N. Rajakovic, S. J. Zubic</i>	

POWER SYSTEM DYNAMICS

Chaotic Behavior Observations in a Power System Model	40
<i>X. Li, C. A. Cañizares</i>	
Faster than Real Time: Dynamic Security Assessment for Foresighted Control Actions	45
<i>U. Kerin, G. Bizjak, R. Krebs, E. Lerch</i>	
High-Speed, Mixed-Signal Emulation for Power System Dynamic Analysis	52
<i>L. Fabre, I. Nagel, R. Cherkaoui, M. Kayal</i>	
Small Disturbance Angle Stability Indication in the Electrical Networks with Variable Speed Wind Turbines	60
<i>N. F. Jahromi, J. Boemer, G. Papaefthymiou, L. van der Sluis</i>	
Bifurcations and Loadability Issues in Power Systems	67
<i>H. A. Pulgar-Painemal, P. W. Sauer</i>	
Dynamic Models for Transient Stability Analysis of Transmission and Distribution Systems with Distributed Generation: An Overview	73
<i>J. Boemer, M. Gibescu, W. L. Kling</i>	
Stability Investigation of HV Networks in Presence of Large Wind Farms	81
<i>M. Brenna, F. Foiadelli, D. Zaninelli</i>	
Simulations of Power System Dynamic Phenomena	86
<i>O. Ruhle, F. Balasin</i>	

PROTECTION SYSTEMS I

Distance Protection Algorithm for Power Transmission Lines based on Monte-Carlo Method	92
<i>M. Zima-Bockarjova, A. Sauhats, J. Kucajevs, N. Halilova, G. Pashnin</i>	
Improved Operating Scheme Using an IEC61850-based Distance Relay for Transformer Backup Protection	99
<i>H-K. Kim, S-H. Kang, S-R. Nam, S-S. Oh</i>	
Distance Protections Coordination Using the Exchange of Binary Signals in the IEC61850 Protocol	105
<i>R. Kowalik, M. Januszewski</i>	
Performance of Distance Relays in Presence of IPFC	110
<i>M. Pouyan, F. Razavi, M. Rashidi-Nejad</i>	
Distance Relaying Algorithm using a DFT-based Modified Phasor Estimation Method	116
<i>D-G. Lee, Y-J. Oh, S-H. Kang, B. M. Han</i>	

DISTRIBUTION SYSTEMS PLANNING AND OPERATION

Neutral-Point Shifting and Voltage Unbalance due to Single-Phase DG Units in Low Voltage Distribution Networks	122
<i>L. Degroote, B. Renders, B. Meersman, L. Vandeveld</i>	
Neutral Earthing in Off-Shore Wind Farm Grids	130
<i>R. van de Sandt, J. Löwen, J. Paetzold, I. Erlich</i>	
Power Networks' Robustness Oriented Extension	138
<i>D. Sarchiz, V. Dub</i>	
Optimal Sizing and Siting of Distributed Generation in Radial Distribution Network: Comparison of Unidirectional and Bidirectional Power Flow Scenario	142
<i>M. Mashhour, M. A. Golkar, S. M. M. Tafreshi</i>	
Application of MA with RMSLS to Probabilistic Distribution Network Expansion Planning	150
<i>H. Mori, T. Yoshida</i>	
LV Self Balancing Distribution Network Reconfiguration for Minimum Losses	156
<i>D. V. Nicolae, M. W. Siti, A. A. Jimoh</i>	
Evaluation of Probabilistic-based Selectivity Technique for Earth Fault Protection in MV Networks	162
<i>A. M. Elhaffar, N. I. Elkalashy, N. G. Tarhuni, M. F. Abdel-Fattah, M. Lehtonen</i>	
Voltage Sags Pattern Recognition Technique for Fault Section Identification in Distribution Networks	167
<i>H. Mokhlis, A. R. Khalid, H. Y. Li</i>	

POWER FLOW CALCULATION

New Method based on Load Flow with Step Size Optimization for Calculating the Maximum Loading Point	173
<i>B. L. Tavares, M. F. Bedriñana, C. A. Castro</i>	
Simple Method for Computing Power Systems Maximum Loading Conditions	180
<i>C. H. Fujisawa, C. A. Castro</i>	
Fast Decoupled Steady-State Solution for Power Networks Modeled at the Bus Section Level	186
<i>E. M. Lourenço, N. S. Silva, A. S. Costa</i>	
Probabilistic Load Flow Calculation based on an Enhanced Convolution Technique	193
<i>J. Schwippe, O. Krause, C. Rehtanz</i>	
Discrete Solutions of Electric Power Systems based on a Differentiation Matrix and a Newton Method	199
<i>N. García</i>	
Steady-State Calculation of Electrical Power System by the Newton's Method in Optimization	204
<i>A. V. Pazderin, S. V. Yuferev</i>	
A Simple and Reliable Algorithm for Computing Boundaries of Power Flow Solutions due to System Uncertainties	210
<i>A. Vaccaro, C. A. Cañizares, D. Villacci</i>	
A Novel Z-Matrix Algorithm for Distribution Power Flow Solution	216
<i>T-C. Ou, W-M. Lin</i>	

INTEGRATION OF DISTRIBUTED GENERATION II

Impact of the Wind Forecast Error on the French Balancing System	224
<i>V. Lavier, M. Giralt-Devant</i>	
Optimum Distributed Generation Penetration In a Distribution Network	230
<i>G. N. Koutroumpetis, A. S. Safigianni</i>	
PV Systems Penetration and Allocation to an Urban Distribution Network: A Power Loss Reduction Approach	238
<i>A. G. Marinopoulos, A. S. Bouhouras, G. K. Peltekis, A. K. Makrygiannis, D. P. Labridis</i>	
New Tool for Integration of Wind Power Forecasting into Power System Operation	244
<i>A. F. Gubina, A. Keane, P. Meibom, J. O'Sullivan, O. Goulding, T. McCartan, M. O'Malley</i>	
Technical Challenges in Modernizing Distribution Electric Power Systems with Large Number of Distributed Generators	250
<i>M. H. Nazari, M. Ilic</i>	
The Connection to the Grid of Wind Turbines	258
<i>D. Dragomir, N. Golovanov, P. Postolache, C. Toader</i>	
Integrating RES into the Romanian Transport System	266
<i>N. Golovanov, G. C. Lazaroiu, M. Roscia, D. Zaninelli</i>	

A New Tool for Wind Farm Optimal Design	272
<i>J. S. González, A. G. G. Rodríguez, J. C. Mora, J. R. Santos, M. B. Payán</i>	

TRANSIENT STABILITY

PSO-ANN Approach for Transient Stability Constrained Economic Power Generation	279
<i>A. Hoballah, I. Erlich</i>	
Application of Dynamic Sensitivity Theory to Assess the Thyristor-based FACTS Controllers' Effect on the Transient Stability of Power Systems	285
<i>E. A. Zamora-Cárdenas, C. R. Fuerte-Esquivel, L. Contreras-Aguilar</i>	
Transient Stability Improvement Using the Associate Hermite Assisted Prediction Technique	292
<i>B. L. Kokanos, G. G. Karady</i>	
Implementation of the Enhanced Binary-SIME Method for Finding Transient Stability Limits with PSS/E™	298
<i>H. M. Tan, D. J. Vowles, R. Zivanovic</i>	
Performance Evaluation of Indices for Transient Stability	306
<i>U. Kerin, M. Bojan, G. Bizjak</i>	
Enhanced Stability of EHV Power Networks with HVDC Connections	312
<i>S. Vogt, P. Stachel, P. Schegner</i>	
A Method of Transient Electromechanical Processes Modeling in Power Systems	318
<i>N. F. Džagarov</i>	

PROTECTION SYSTEMS II

A New Transformer Hysteresis Model in MATLAB™ Simulink	324
<i>O. Ozgonenel, H. Dirik, I. Guney, O. Usta</i>	
Sensitive Protection of Power Transformers for Internal Inter-Turn Faults	331
<i>A. Wiszniewski, W. Rebizant, L. Schiel</i>	
Application of Discrete Wavelet Transform for Differential Protection of Power Transformers	337
<i>M. O. Oliveira, A. S. Bretas</i>	
Optimal Radial Basis Function Neural Network Power Transformer Differential Protection	345
<i>M. Tripathy, S. Ala</i>	
Protection of Oil-Filled Transformer Against Explosion: Numerical Simulations on a 200 MVA Transformer	353
<i>S. Muller, M. P. Boiarciuc, G. Perigaud</i>	
Current Differential Relay with a Power-Current Spectrum Blocking for Transformer Protection	361
<i>H. A. Darwish, M. Lehtonen</i>	

TRANSMISSION EXPANSION PLANNING

Components' Impact on Critical Transfer Section for Risk based Transmission System Planning	368
<i>J. Setréus, S. Arnborg, R. Eriksson, L. Bertling</i>	
Greenfield Planning of Modern Metropolises	376
<i>D. Audring, M. Hable, E. Lerch, K. Schilling</i>	
Hydrothermal System Operation and Transmission Planning Considering Large Wind Farm Connection	382
<i>M. Raby, S. Rios, S. Jerardino, J. C. Araneda, R. Raineri</i>	
Transmission Expansion Planning Under Uncertainty – the Role of FACTS in Providing Strategic Flexibility	390
<i>G. A. Blanco, F. G. Olsina, O. A. Ojeda, F. F. Garcés</i>	
Valuing a Flexible Regulatory Framework for Transmission Expansion Investments	398
<i>G. A. Blanco, R. M. Pringles, F. G. Olsina, F. F. Garcés</i>	
Upgrading a 220 kV Double Circuit Transmission LINE in Romania; Study of the Possible Solutions, Technical and Economic Comparison	406
<i>E. Mateescu, D. Marginean, G. Gheorghita, E. Dragan, S. Gal, C. Matea</i>	
Systematical Determination of Load Flow Cases for Power System Planning	413
<i>G. Rechberger, H. Renner, A. Gaun</i>	

POWER SYSTEM RELIABILITY

Reliability Model of Large Offshore Wind Farms	419
<i>E. Spahic, A. Underbrink, V. Buchert, J. Hanson, I. Jeromin, G. Balzer</i>	
Enhancement of the Reliability of Extra and Ultra High Voltage Transmission Systems	425
<i>M. Ramold, J. Jäger</i>	
Impacts of Loop Restoration Strategy on Distribution System Reliability	433
<i>S. Kazemi, M. Fotuhi-Firuzabad, M. Sanaye-Pasand, M. Lehtonen</i>	
Reliability Studies of a PV-WG Hybrid System in Presence of Multi-Micro Storage Systems	441
<i>A. Burgio, D. Menniti, A. Pinnarelli, N. Sorrentino</i>	
Reliability of Islanded Microgrids with Stochastic Generation and Prioritized Load	446
<i>S. Kennedy, M. M. Marden</i>	
Power System Reliability Modeling with Aging Using Thinning Algorithm	453
<i>H. Kim, C. Singh</i>	
Fast Minimal Cutset Evaluation in Cyclic Undirected Graphs for Power Transmission Systems	459
<i>A. Gaun, H. Renner, G. Rechberger</i>	

LOAD AND WIND POWER FORECASTING

Confidence Interval Estimation for Short-term Load Forecasting	467
<i>B. Petiau</i>	
New Robust Method Applied to Short-term Load Forecasting	473
<i>Y. Chakhchoukh, P. Panciatici, L. Mili</i>	
Load Forecasting Scheme Based on Energy Efficiency for Planning the Expansion of Electrical Systems	479
<i>J. L. C. Arias, D. Westermann</i>	
Short Term Wind Speed Prediction by Finite and Infinite Impulse Response Filters: A State Space Model Representation Using Discrete Markov Process	487
<i>N. Abdel-Karim, M. Small, M. Ili</i>	
Clustering based Short Term Load Forecasting using Support Vector Machines	495
<i>A. Jain, B. Satish</i>	
Load Forecast under Uncertainty: Accounting for the Economic Crisis Impact	503
<i>L. Pinto, J. Szczupak, C. Almeida, L. Macêdo, M. Inoue, R. Massaro, R. Semolini, J. Pascon, E. Albarelli, D. Tortelli</i>	
Wind Power Short-Term Forecasting System	508
<i>C. Dica, C-I. Dica, D. Vasiliu, G. Comanescu, M. Ungureanu</i>	
Long Term Multi-Scale Analysis of the Daily Peak Load based on the Empirical Mode Decomposition	515
<i>M. O. M. Mahmoud, F. Mhamdi, M. Jaïdane-Saïdane</i>	

FACTS APPLICATIONS IN POWER SYSTEMS

Mitigation of Subsynchronous Oscillations by 48-Pulse VSC STATCOM Using Remote Signal	521
<i>A. Salemnia, M. Khederzadeh, A. Ghorbani</i>	
Impact of the StatCom on the Power System Feasibility Region Boundary	528
<i>H. R. Carvajal-Peréz, C. R. Fuerte-Esquivel</i>	
Applying TCSC Frequency Response Data Derived Using Electromagnetic Transient Analysis in SSR Frequency Scanning Studies	536
<i>P. Vuorenpää, T. Rauhala, P. Järventausta</i>	
FACTS to Enhance Availability and Stability of AC Power Transmission	542
<i>R. Grünbaum</i>	
A Modified Nonlinear Damping of Zero - Dynamics via Feedback Control for a STATCOM	550
<i>Y. Han, Y. O. Lee, C. C. Chung</i>	
Interactions Analysis of UPFC Multifunction Controller	558
<i>S. Robak, D. D. Rasolomampionona</i>	
Dynamic Phase-Domain Modelling and Simulation of STATCOM in Large-Scale Power Systems	565
<i>E. Barrios-Martínez, C. Angeles-Camacho, E. Acha, M. A. Olgún-Becerril</i>	
Harmonic Modeling of Multi-Pulse SSSC	573
<i>P. Zúñiga-Haro</i>	

OSCILLATIONS DAMPING

Robust Coordinated Tuning of Parameters of Standard Power System Stabilizers for Local and Global Grid Objectives.....	581
<i>B. Marinescu, B. Mallem, H. Bourlès, L. Rouco</i>	
Robust UPFC Controller Design Using Quantitative Feedback Theory Method.....	588
<i>S. A. Taher, S. Akbari, A. Ketabi, R. Hematti, A. Abdolalipour</i>	
Quasi-Steady-State Modeling of Interarea Oscillations	596
<i>C. D. Vournas, J. C. Mantzaris</i>	
Realization of a “Band-Stop” Device to Damp Inter-Area Oscillations with Intervention into the Turbine Governor.....	603
<i>L. Kiss, J. Zerényi</i>	
Damping of Power-System Oscillations with the Application of a GUPFC.....	607
<i>V. Azbe, R. Mihalic</i>	
PSS Design for the Hellenic System with Partial Interconnection to Turkey.....	613
<i>B. M. Nomikos, M. E. Kouveletsou, C. D. Vournas</i>	
Power System Control based on the Identification of Oscillation Modes	620
<i>F. B. Prioste, A. S. eSilva, I. C. Decker</i>	

WIND FARM OPERATION

Evaluating the Performance of External Fault Ride-Through Solutions used in Wind Farms with Fixed Speed Induction Generators when Facing Unbalanced Faults.....	626
<i>F. O. Resende, J. A. Peças-Lopes</i>	
Grid Integration Impacts on Wind Turbine Design and Development.....	632
<i>A. D. Hansen, N. A. Cutululis, P. Sørensen, F. Iov</i>	
Electrical Grid Integration and Power Quality Studies of a Variable-Speed Wind Energy Conversion System.....	639
<i>R. Melício, V. M. F. Mendes, J. P. S. Catalão</i>	
Protections Impact on the Availability of a Wind Power Plant Operating in Real Conditions.....	645
<i>I-S. Ilie, G. Chicco, P. Di Leo, F. Spertino</i>	
Verification of the Reactive Power Requirements in Wind Farms.....	652
<i>V. León, J. Montañana, J. Roger, E. Gómez, M. Cañas, J. A. Fuentes, A. Molina</i>	
Verification of Wind Parks and their Integration into Small-Interconnected Power System	656
<i>J. Kilter, M. Landsberg, I. Palu, O. Tšernobrovkin</i>	
Conversion of a Switched Reluctance Motor to Operate as a Generator for Wind Power Applications	662
<i>M. Nassereddine, J. Rizk, M. Nagrial</i>	
Wind Turbine Modelling for Transient Analysis: Application to the Spanish Grid Code.....	667
<i>A. J. Pujante-López, J. A. Fuentes-Moreno, E. Gómez-Lázaro, A. Molina-García, M. Cañas-Carretón</i>	

HARMONICS AND FLICKER

Strategies in Technical Loss Reduction and it’s Impact on Harmonic Performance of Distribution Network	675
<i>M. T. Au, T. M. Anthony, M. Mohamad</i>	
Peculiar Properties of Voltage Phase Fluctuation Calculations at Power Networks with Rapid Variable Loads.....	681
<i>A. Lipsky, E. Rosentul</i>	
Application of Parameter Estimation Methods to the Assessment of DFIG’s Currents.....	685
<i>E. Torres, S. Djurovi, V. Terzija, S. Williamson</i>	
Comparison of Calculated and Measured Flicker Values for Two Different Network Topologies	691
<i>M. Maksic, B. Blažic, I. Papic</i>	
Novel Analytical Approximation Method of Frequency Dependent Thevenin Impedance	699
<i>P. Kiss, A. Dán</i>	
A Novel Algorithm based on Honey Bee Mating Optimization for Distribution Harmonic State Estimation Including Distributed Generators.....	704
<i>A. Arefi, M-R. Haghifam, S. H. Fathi, T. Niknam, J. Olamaei</i>	

A.I. APPLICATIONS IN POWER SYSTEMS: GENETIC ALGORITHMS AND DECISION TREES

A Specialized Genetic Algorithm to Solve the Short Term Transmission Network Expansion Planning	711
<i>L. A. Gallego, M. J. Rider, R. Romero, A. V. Garcia</i>	
Critical Consideration of the Suitability of Randomized Optimization Methods: Power System Topology Estimation Problem	718
<i>M. Zima-Bockarjova, E. Scholtz, M. Larsson, G. Andersson</i>	
Multi-deme Parallel Genetic Algorithm in Reliability Analysis of Composite Power Systems	725
<i>L. Wang, C. Singh</i>	
Network Reconfiguration to Improve Reliability and Efficiency in Distribution Systems	731
<i>R. M. Vitorino, L. P. Neves, H. M. Jorge</i>	
Applying Genetic Algorithms to REI System Equivalents	738
<i>O. Ivanov, M. Gavrilas</i>	
Genetic Algorithms and Treatment of Multiple Objectives in the Allocation of Capacitor Banks in an Electric Power Distribution System	744
<i>W. A. dos Santos-Fonseca, F. G. N. Barros, U. H. Bezerra, R. C. L. Oliveira, M. V. A. Nunes</i>	
Pricing Analysis in the Brazilian Energy Market: A Decision Tree Approach	752
<i>J. C. R. Filho, C. M. Affonso, R. C. L. Oliveira</i>	
Optimal SVC Placement in Electric Power Systems Using a Genetic Algorithms Based Method	758
<i>I. Pisica, C. Bulac, L. Toma, M. Eremia</i>	

HVDC SYSTEMS

Multivariable Feedback Design of VSC-HVDC Connected to Weak AC Systems	764
<i>L. Zhang, H-P. Nee</i>	
Integration of Hydrogen Generator into Wind Farm Interconnected HVDC System	772
<i>S. M. Muyeen, R. Takahashi, T. Murata, J. Tamura</i>	
Sustainability Analysis of VSC-HVDC in the Liberalised European Power System: a Practical Case	779
<i>A. L'Abbate, G. Fulli</i>	
HVDC Control Strategies to Improve Transient Stability in Interconnected Power Systems	787
<i>J. Hazra, Y. Phulpin, D. Ernst</i>	
Use of Local and Remote Information in POD Control of a VSC-HV dc	793
<i>H. F. Latorre, M. Ghandhari, L. Söder</i>	
Analysis of Innovative HVDC Control	799
<i>D. Povh, P. Thepparat, D. Westermann</i>	

PROTECTION SYSTEMS III

Simulation Evaluation of an Integrated Boundary Protection Scheme	806
<i>M. X. Li, Z. Q. Bo, J. H. He, H. Zhang, A. Klimek</i>	
Simulation and Algorithm Development of Protection Scheme in DC Traction System	812
<i>M. X. Li, J. H. He, Z. Q. Bo, T. Yip, L. Yu, A. Klimek</i>	
Elimination of DC Offset in Accurate Phasor Estimation Using Recursive Wavelet Transform	818
<i>J. Ren, M. Kezunovic</i>	
Optimum Setting and Coordination of Overcurrent Relays Considering Cable Damage Curve	823
<i>S. M. Mousavi, H. A. Abyaneh, M. Mahdavi</i>	
Neural Network based Overcurrent Voltage Controlled Protection System in Large Electrical Networks	828
<i>Y. G. Mostafa, M. S. Aly</i>	
Selective Detection of Simple and Double Grounding within the Medium Voltage Electrical Networks with Compensated Null	834
<i>D. Toader, P. Ruset, I. Hategan, I. Diaconu, N. Pinte</i>	

ISLAND OPERATION

Active Islanding of a Current-Controlled Converter-Interfaced DG	843
<i>F. Hassan, M. H. J. Bollen</i>	

Dynamic Analysis of Transition into Island Conditions of Slovenian Power System Applying Underfrequency Load Shedding Scheme.....	849
<i>U. Rudez, R. Mihalic</i>	
Probabilistic Study of the Maximum Penetration Rate of Renewable Energy in an Island Network	855
<i>H. Bayem, L. Capely, F. Dufourd, M. Petit</i>	
Controlled Island Operation of Part of the 50-kV Grid in Southern Sweden	860
<i>M. H. J. Bollen, O. Samuelsson</i>	
Performance Indicators for MicroGrids During Grid-connected and Island Operation	866
<i>M. H. J. Bollen, J. Zhong, O. Samuelsson, J. Björnstedt</i>	
Frequency and Active Power Control in Islanded Power Systems Based on the Magnitude of the Disturbance Estimation.....	872
<i>V. Chuvyichin, V. Strelkovs</i>	
Evaluation of Interconnected Power Systems Controlled Islanding	878
<i>S. Najafi</i>	

POWER QUALITY ISSUES I

Computation of Spectral Components in System with Wind Generation Unit	886
<i>P. Janik, T. Lobos, J. Rezmer, P. Schegner, Z. Waclawek</i>	
Analysis of the Steinmetz Compensation Circuit with Distorted Waveforms through Symmetrical Component-Based Indicators	892
<i>G. Chicco, M. Chindris, A. Cziker, P. Postolache, C. Toader</i>	
Performance Analysis of Wavelet Based Denoise System for Power Quality Disturbances.....	898
<i>R. H. G. Tan, V. K. Ramachandaramurthy</i>	
Power Exchanging Control of DG Units on Faulty Grid and Time-Varying Frequency Environments.....	903
<i>M. Choopani, H. A. Abyaneh, S. H. Fathi, B. Ansari</i>	
A Comparative Analysis of FBD, PQ and CPT Current Decompositions – Part I: Three-Phase Three-Wire Systems.....	909
<i>H. K. M. Paredes, F. P. Marafão, L. C. P. da Silva</i>	
A Comparative Analysis of FBD, PQ and CPT Current Decompositions – Part II: Three-Phase Four-Wire Systems.....	917
<i>H. K. M. Paredes, F. P. Marafão, L. C. P. da Silva</i>	
Selective Current Compensators Based on the Conservative Power Theory	923
<i>H. K. M. Paredes, F. P. Marafão, L. C. P. da Silva</i>	

A.I. APPLICATIONS IN POWER SYSTEMS: ARTIFICIAL NEURAL NETWORKS

Use of the “ANAPRO” Software to Analyze and Forecast Operating Parameters and Technological Characteristics on the Basis of Macro Applications	930
<i>V. G. Kurbatsky, N. V. Tomin</i>	
Supervised Learning of Intra-daily Recourse Strategies for Generation Management Under Uncertainties	938
<i>B. Cornélusse, G. Vignal, B. Defourny, L. Wehenkel</i>	
Theory of Informational Species and its Implications in the Power System Protection, Measurement and Control Systems.....	946
<i>N. Pinte, P. Postolache, C. Nitu, S. Gal, M. N. Oltean, P. Ruset</i>	
Neural Identification of SSSC Based on Average Model Using GAMMA, DNN, RBF and MLP for Steady State Calculations.....	952
<i>M. T. Bina, A. H. Viki, S. Rahimzadeh</i>	
Load Forecasting based on Neural Networks and Load Profiling.....	960
<i>J. C. Sousa, L. P. Neves, H. M. Jorge</i>	
Data-Driven Reliability Modeling, Based on Data Mining in Distribution Network Fault Statistics	968
<i>E. Akhavan-Rezai, M-R. Haghifam, A. Fereidunian</i>	
An Hybrid Aggregate Model Applied to the Short-Term Bus Load Forecasting Problem	974
<i>R. M. Salgado, R. Ballini, T. Ohishi</i>	

POWER ELECTRONICS APPLICATIONS IN POWER SYSTEMS

Simple Topologies for AC-Link Flexible AC Transmission Systems	982
<i>J. C. Rosas-Caro, J. M. Ramirez, F. Z. Peng</i>	
A Method to Synchronize Single-phase Floating with Grid Without High Voltage Measurement Or High Bandwidth Communication	990
<i>Z. Yuan, S. W. H. de Haan, B. Ferreira</i>	
High-Power, Resonant DC/DC Converter for Integration of Renewable Sources	996
<i>D. Jovcic, B. T. Ooi</i>	
Nash Genetic Algorithm Based Optimal Design of Hysteresis Inverters for Active Power Filtering Applications	1002
<i>S. M. R. Rafiei, M. H. Kordi, G. Griva, A. Tenconi</i>	
Layout and Performance of the Power Electronic Converter Platform for the VSYNC Project	1008
<i>T. Loix, S. De Breucker, P. Vanassche, J. Van den Keybus, J. Driesen, K. Visscher</i>	

PROTECTION SYSTEMS IV

An Integrated Approach for Positional Protection of Transmission Lines	1016
<i>H. Zhang, J. H. He, Z. Q. Bo, M. X. Li, A. Klimek</i>	
New Variable Window Adaptive Distance Protection for Tee'd Feeders	1021
<i>M. Lukowicz, M. Michalik, W. Rebizant, S-J. Lee</i>	
High Degrees of Series Capacitors in Bulk Power Transmission Systems Need Special Protection Principles	1027
<i>V. Henn, R. Krebs, G. Arruda, R. Dutra, P. Campos</i>	
Fault Data Collection in Substations According to IEC 61850	1034
<i>S. Mesentean, H. Frank, K. Fleischmann, M. Stuhler</i>	
Modified Distance Protection due to Presence of STATCOM on a Transmission Line	1040
<i>S. Jamali, A. Kazemi, H. Shateri</i>	
Tripping Overvoltages in HV Transmission Networks Equipped with Shunt Reactors	1046
<i>M. Ciontu, D. Rusinaru, I. Mircea</i>	
A New DC Feeder Protection Based On Wavelet Transform	1051
<i>L. Yu, J. H. He, Z. Q. Bo, M. X. Li, T. Yip, A. Klimek</i>	

ENERGY STORAGE AND HYBRID ELECTRICAL VEHICLES

Some Aspects of Distributed Generation – Voltage Drop and Energy Storage	1056
<i>B. Hartmann, A. Dán</i>	
Identifying Management Procedures to Deal with Connection of Electric Vehicles in the Grid	1062
<i>J. A. Peças-Lopes, F. J. Soares, P. M. Rocha-Almeida</i>	
Integration of Plug-In Hybrid Electric Vehicles into Energy Networks	1070
<i>M. D. Galus, G. Andersson</i>	
VRB Modeling for Storage in Stand-Alone Wind Energy Systems	1078
<i>L. Barote, C. Marinescu, M. Georgescu</i>	
Optimal Integration of Energy Storage in Distribution Networks	1084
<i>G. Celli, S. Mocci, F. Pilo, M. Loddo</i>	
Unit Commitment with Vehicle-to-Grid using Particle Swarm Optimization	1091
<i>A. Y. Saber, G. K. Venayagamoorthy</i>	
Battery Storage System Sizing in Distribution Feeders with Distributed Photovoltaic Systems	1099
<i>C. Venu, Y. Riffonneau, S. Bacha, Y. Baghzouz</i>	
Selecting the Power Electronic Interface for a Supercapattery Based Energy Storage System	1104
<i>C. Klumpner, G. Asher, G. Z. Chen</i>	

POWER QUALITY ISSUES II

Computation of Voltage Sag Initiation with Fourier based Algorithm, Kalman Filter and Wavelets	1111
<i>H. Amaris, C. Álvarez, M. Alonso, D. Florez, T. Lobos, P. Janik, J. Rezmer, Z. Waclawek</i>	

Optimization Methods with Power Quality Issues for Reactive Power Control of Distribution Networks with Dispersed Generation	1117
<i>C. Battistelli, G. Carpinelli, U. De Martinis, F. Mottola, D. Proto</i>	
Methodology for Development of Customized Customer Damage Functions for Evaluation of Financial Losses due to Voltage Sags and Interruptions	1125
<i>J. Y. Chan, J. V. Milanović</i>	
Optimal Unified Power Quality Conditioner with Improved Compensation Performance under Distorted Voltages.....	1131
<i>S. M. R. Rafiei, R. Asadi, G. Griva, R. Bojoi</i>	
Experimental Investigation of Existing Methodologies for the Responsibilities Assignment Problem	1139
<i>A. Pavas, V. Staudt, H. Torres-Sánchez</i>	
Assessment of Power Lines Performance Based on Voltage Sag Indices	1147
<i>R. C. Leborgne, T. C. de Oliveira, J. M. de Carvalho-Filho, G. T. Watanabe, J. F. de Oliveira</i>	
The Power Quality Monitoring Systems in Romanian Power Grid	1153
<i>C. Stanescu, S. Gal, S. Pispiris, P. Postolache</i>	

COMMUNICATIONS

A SCADA System Using Mobile Agents for a Next-Generation Distribution System	1158
<i>T. Otani, H. Kobayashi</i>	
Interaction Between Equipment and Power Line Communication: 9-95 kHz	1166
<i>S. K. Rönnerberg, M. Wahlberg, E. O. A. Larsson, M. H. J. Bollen, C. M. Lundmark</i>	
IEC 61850 Substation to Control Center Communication – Status and Practical Experiences from Projects	1171
<i>H. Englert, H. Dawidczak</i>	
Test Bench for Self-healing Functionalities applied on Distribution Network with Distributed Generators.....	1177
<i>L. Le-Thanh, R. Caire, B. Raison, S. Bacha, F. Blache, G. Valla</i>	
Survey on Priorities and Communication Requirements for PMU-based Applications in the Nordic Region	1183
<i>M. Chenine, K. Zhu, L. Nordström</i>	
Reducing Conventional Copper Signaling in High Voltage Substations with IEC 61850 Process Bus System.....	1191
<i>D. McGinn, M. Adamiak, M. Goraj, J. Cardenas</i>	
Wireless-Broadband over Power Lines Networks: A Promising Broadband Solution in Rural Areas.....	1199
<i>G. I. Tsiropoulos, A. M. Sarafi, P. G. Cottis</i>	
Turbogenerator Mechanical Vibrations Telesurveillance System.....	1205
<i>V. Croitoru, T. Voica, A. Grigore, B. Toader</i>	

FREQUENCY CONTROL AND LOAD MODELLING

Application of Self-Tuning FPIC to AGC for Load Frequency Control in Multi-Area Power System.....	1211
<i>M. R. I. Sheikh, S. M. Muyeen, R. Takahashi, T. Murata, J. Tamura</i>	
A Modified Power System Model for AGC Analysis	1218
<i>D. D. Rasolomampionona</i>	
Power System Dynamic Performance: Primary Governing Frequency Response.....	1224
<i>S. Sterpu</i>	
The Effects of Normalization of Static Load Characteristics.....	1230
<i>L. M. Korunovic, D. P. Stojanovic</i>	
Dynamic Load Parameter Assessment Based on Continuous Recorder Measurements	1236
<i>B. Genêt, J-C. Maun</i>	
Missing Data Treatment of the Load Profiles in Distribution Networks	1244
<i>G. Grigoras, G. Cartina, E. C. Bobric, C. Barbulescu</i>	
Process Modelling for Load Frequency Control in Power Systems.....	1249
<i>S. St. Iliescu, I. Fagarasan, C. Soare, D. Ilisiu, F. Biliboaca</i>	
Frequency Behavior of Grid with High Penetration Rate of Wind Generation	1255
<i>J. Duval, B. Meyer</i>	

PROTECTION SYSTEMS V

Impact of Static Synchronous Compensator (STATCOM) on Performance of Distance Relay	1261
<i>A. Salemnia, M. Khederzadeh, A. Ghorbani</i>	
Protection Security Assessment for Large Power Systems.....	1269
<i>J. Jäger, R. Lubiatowski, G. Ziegler, R. Krebs</i>	
Protection Relay Systems Employing Unconditionally Secure Authentication Codes.....	1275
<i>T. Matsumoto, T. Kobayashi, S. Katayama, K. Fukushima, K. Sekiguchi</i>	
A Laboratory Setup of a Power System Scaled Model for Testing and Validation of EMS Applications	1281
<i>A. P. S. Meliopoulos, G. J. Cokkinides, S. Mohagheghi, Q. B. Dam, R. H. Alaileh, G. K. Stefopoulos</i>	
Use of Distributed Topology Detection for Applications in Substation Automation.....	1289
<i>K-P. Brand, W. Wimmer</i>	
Protection Scheme Switch-Timing for Doubly-Fed Induction Generator during Fault Conditions.....	1295
<i>J. Yang, J. O'Reilly, J. E. Fletcher</i>	
Dynamic Model Based Complex Checking of Out-of-step Protections	1301
<i>D. M. Paunescu, R. Balaurescu, H. E. Olovsson</i>	

POWER SYSTEM MEASUREMENT

A Unified Algorithm for Observability and Redundancy Analysis	1309
<i>R. A. S. Benedito, J. B. A. London, N. G. Bretas</i>	
Parameter Identification of Unsymmetrical Transmission Lines	1316
<i>R. Schulze, P. Schegner</i>	
Development of a Compensating Algorithm for an Iron-cored Measurement Current Transformer	1323
<i>T-Y. Zheng, Y-C. Kang, J-S. Choi, H-G. Kang, S-I. Jang, Y-K. Kim, H-J. Lee</i>	
Cluster Analysis of Half-Cycle Duration Measurements to Classify Local and Network Events	1329
<i>D. Apetrei, G. Chicco, P. Postolache, N. Golovanov, M. Albu</i>	
Setup of the Laboratory for Synchronized Measurement for PMU's Testing.....	1336
<i>V. Terzija, S. S. Wu, J. Fitch</i>	
Measurement Analysis of an Advanced Control System for Reducing the Energy Consumption of Public Street Lighting Systems	1342
<i>H. Andrei, C. Cepisca, V. Dogaru-Ulieru, T. Ivanovici, L. Stancu, P. C. Andrei</i>	
Cost Benefit Analysis for Implementation of a System for Remote Control and Automatic Meter Reading.....	1348
<i>N. Rajakovic, D. Nikolic, J. Vujasinovic</i>	

DEMAND SIDE MANAGEMENT

A Model Predictive Control Strategy for Load Shifting in a Water Pumping Scheme with Maximum Demand Charges.....	1354
<i>A. J. van Staden, J. Zhang, X. Xia</i>	
Application Genetic Algorithms for Load Management in Refrigerated Warehouses with Wind Power Penetration	1361
<i>Y. Zong, T. Cronin, O. Gehrke, H. Bindner, J. C. Hansen, M. I. Latour, O. U. Arcauz</i>	
Using Frequency Dependent Electric Space Heating Loads to Manage Frequency Disturbances in Power Systems.....	1367
<i>A. Rautiainen, S. Repo, P. Järventausta</i>	
Air Conditioner Direct Load Control in Distribution Networks	1373
<i>T. Tran-Quoc, J. C. Sabonnadière, N. Hadjsaid, C. Kieny</i>	
Improved Energy Services Provision through the Intelligent Control of Distributed Energy Resources.....	1379
<i>M. A. Pedrasa, E. D. Spooner, I. F. MacGill</i>	
Physically-Based Load Demand Models for Assessing Electric Load Control Actions	1387
<i>A. Gomes, C. H. Antunes, A. G. Martins</i>	
MV Producers and Consumers Agents Characterization with DSM Techniques.....	1395
<i>H. Morais, S. Ramos, Z. Vale, H. Khodr</i>	

POSTER SESSION I

Speed Control of Permanent Magnet Synchronous Motor Using Digital Pole Placement Controller.....	1403
<i>H. M. Hasanien, S. M. Muyeen, J. Tamura</i>	
Examination of Smart Grids in Island Operation.....	1408
<i>I. Vokony, A. Dán</i>	
Retrofit Implementation of Medium Voltage Contactors at Abou Quir Power Station in Egypt.....	1415
<i>A. A. Ghazala</i>	
A Control Strategy for Integration of a PEMFCS to a Distribution Grid	1421
<i>C. N. Papadimitriou, N. A. Vovos</i>	
ExpDTS - Hybrid Dispatcher Training Simulator Expert System for Operator Assistance and Evaluation	1427
<i>D. Bolborici</i>	
Optimization of Power Reserves in Market Conditions	1432
<i>A. Mahnitko, J. Gerhards, T. Lomane, S. Ribakovs</i>	
Network State Indicators in Flexibility Evaluation for Operational Planning in Electricity Market	1438
<i>A. Capasso, M. C. Falvo, R. Lamedica, S. Scalcino</i>	
Historical Data Analysis of Lightning and its Relation with the Portuguese Transmission System Outages.....	1444
<i>S. A. B. de Almeida, C. Loureiro, F. P. Maciel-Barbosa, R. Pestana</i>	
Influence of Inter Area Transfer Capacity on the Regional Power System Planning.....	1452
<i>T. Smieja, P. Lombardi, Z. A. Styczynski, S. Löppen</i>	
Plug-in Electric Vehicles as Storage Devices within an Autonomous Power System. Optimization Issue	1458
<i>P. Lombardi, P. Vasquez, Z. A. Styczynski</i>	
Evaluation of Optimal Transfer Capability in Power System Interconnection.....	1465
<i>H-I. Son, J-O. Kim, I-S. Bae</i>	
Feed-In Tariff Scheme for Promoting Wind Energy Generation	1470
<i>C. Kongnam, S. Nuchprayoon</i>	
Smart Storage Solution for Wind Systems	1476
<i>L. Barote, M. Georgescu, C. Marinescu</i>	
Virtual Synchronous Generator: Laboratory Scale Results and Field Demonstration	1482
<i>V. V. Thong, A. Woyte, M. Albu, M. Van Hest, J. Bozelie, J. Diaz, T. Loix, D. Stanculescu, K. Visscher</i>	
A Quasi Dynamic Model Applied to a Ramp Load Increase Study.....	1488
<i>V. O. Albuquerque, R. C. Leme, B. I. L. Lopes, A. C. Z. de Souza, O. A. S. Carpinteiro, R. D. dos Anjos, P. P. Balestrassi</i>	
Allocation of Decentralized Generators in Distribution Networks for Enhancing Normal Operation Loadability	1494
<i>N. G. A. Hemdan, M. Kurrat</i>	
New Participants in SmartGrids and Associated Challenges in the Transition Towards the Grid of the Future	1501
<i>P. Favre-Perrod, R. Critchley, E. Catz, M. Bazargan</i>	
Dynamic Voltage Stability Assessment of an Electric Power System using Trajectory Sensitivity Analysis.....	1506
<i>R. M. M. Pereira, C. M. M. Ferreira, F. P. Maciel-Barbosa</i>	
Using Fuzzy ARTmap Neural Network for Determination of Partial Discharge Location in Power Transformers	1512
<i>H. Nafisi, M. Davari, M. Abedi, G. B. Gharehpetian</i>	
Optimal PMU Placement for Voltage Security Assessment using Decision Tree.....	1516
<i>F. Mahmoodianfard, M. Mohammadi, G. B. Gharehpetian, H. A. Abyaneh</i>	
Cooperative Sensor Networks for Voltage Quality Monitoring in Smart Grids	1521
<i>M. di Bisceglie, C. Galdi, A. Vaccaro, D. Villacci</i>	
Profit-Based Head-Sensitive Behavior of a Hydro Chain: Mixed-Integer Nonlinear Method	1527
<i>J. P. S. Catalão, H. M. I. Pousinho, V. M. F. Mendes</i>	
DGENCO Market Balancing – Cost Repartition under Light Regulation Markets.....	1533
<i>H. Khodr, H. Moraes, Z. Vale, C. Ramos</i>	
Streamlining Large Scale Photovoltaic Arrays for Utility Interconnection.....	1539
<i>U. K. W. Schwabe, P. M. Jansson</i>	
Automatic Security Measures Foreseen in the Romanian Electrical Power System in Case of Major Disturbances.....	1544
<i>F. Balasin, F. Lazar, R. Balaurescu</i>	

Sizing of Photovoltaic Sources and Storage Devices for Stand-Alone Power Plants	1549
<i>R. Rizzo, L. Piegari, P. Tricoli, C. Munteanu</i>	

TRANSMISSION CAPACITY ENHANCEMENT AND CONGESTION MANAGEMENT I

Risk-based TTC Calculation of a Power System with Renewable Energy Resources	1555
<i>N. Paensuwan, A. Yokoyama</i>	
Research on Allocation of Congestion Cost in a Pool Based Market	1563
<i>H. F. Xiao, W. D. Li</i>	
Steady-state Operation of Very Long EHV AC Cable Lines	1569
<i>L. Colla, F. M. Gatta, A. Geri, S. Lauria, M. Maccioni</i>	
Assessment of the Transmission System Capacity to Connect New Generation	1577
<i>M. Scutariu</i>	
Security-based Congestion Management by Means of Demand Response Programs	1583
<i>E. Shayesteh, M. P. Moghaddam, M-R. Haghifam, M. K. Sheikh-El-Eslami</i>	
Power Transfer Capacity Enhancement using SVC	1590
<i>C. Bulac, C. Diaconu, M. Eremia, B. Otomega, I. Pop, L. Toma, I. Tristiu</i>	
Optimal Utilization of Transmission Capacity to Reduce Congestion with Distributed FACTS	1595
<i>H. Li, F. Li, P. Zhang, Xy. Zhao</i>	

STATE ESTIMATION AND PMU

Network Branch Parameter Validation Based on a Decoupled State/Parameter Estimator and Historical Data	1600
<i>M. R. M. Castillo, J. B. A. London, N. G. Bretas</i>	
PMU placement on the basis of SCADA measurements for fast load flow calculation in electric power systems	1607
<i>A. M. Glazunova, I. N. Kolosok, E. S. Korkina</i>	
Phasor Measurement Units' Allocation in Unified Electrical Power Network of Egypt	1613
<i>N. H. El-Amry, Y. G. Mostafa, M. M. Mansour, S. F. Mekhamer, M. A. Badr</i>	
State Estimation Including Synchronized Measurements	1619
<i>S. Chakrabarti, E. Kyriakides, G. Valverde, V. Terzija</i>	
Comparison of Different Methods for Optimal Placement of PMUs	1624
<i>A. M. Almutairi, J. V. Milanović</i>	
Identifying Critical Sets in State Estimation Using Gram Matrix	1630
<i>M. C. de Almeida, E. N. Asada, A. V. Garcia</i>	
Possibility of Enhancing Classical Weighted Least Squares State Estimation with Linear PMU Measurements	1635
<i>C. Bruno, C. Candia, L. Franchi, G. Giannuzzi, M. Pozzi, R. Zaottini, M. Zaramella</i>	
Geometrical Approaches for Gross Errors Analysis in Power Systems State Estimation	1641
<i>N. G. Bretas, J. B. A. London, L. F. C. Alberto, R. A. S. Benedito</i>	

EMERGENCY CONTROL ACTIONS

Local vs. Wide-area Under Voltage Load Shedding in the Presence of Induction Motor Loads	1648
<i>B. Otomega, T. Van Cutsem</i>	
Minimization of Interrupted Power Using Coordinated Control of Multiple Unified Power Flow Controllers, Generators and Load Shedding	1655
<i>K-I. Kawabe, A. Yokoyama</i>	
Load Shedding – Coordination between the Portuguese Transmission Grid and the Distribution Grid with Minimization of Loss of Distributed Generation	1662
<i>R. V. Fernandes, S. A. B. de Almeida, F. P. Maciel-Barbosa, R. Pestana</i>	
Power System Reconfiguration Based on Multilevel Graph Partitioning	1668
<i>J. Li, C-C. Liu</i>	
Complex Network Theory and Graph Partitioning: Application to Large Interconnected Networks	1673
<i>B. Rozel, R. Caire, N. Hadsaid, J-P. Rognon, C. Tranchita</i>	
A New Soft Load Shedding: Power System Stability with Contribution from Consumers	1679
<i>D. Craciun, S. Ichim, Y. Bésanger</i>	

ANCILLARY SERVICES

Five Good Reasons to Abandon Synchronous Time Control	1685
<i>Y. G. Rebours, J. Pestourie, E. J. Monnot</i>	
Monitoring of Generating Units' Contribution to Frequency and Voltage Control	1691
<i>P. Juston, F. Guy, S. Henry, P. Bertolini</i>	
A MILP Approach to the Short Term Hydrothermal Self-Scheduling Problem	1696
<i>C. K. Simoglou, P. N. Biskas, A. G. Bakirtzis</i>	
Operating Reserve Adequacy Evaluation using Uncertainties of Wind Power Forecast	1704
<i>M. A. Matos, R. Bessa</i>	
Participation of Distributed Generation in Balance Management	1712
<i>J. Frunt, A. Kechroud</i>	
Energy-Reserve Markets with Non-Convexities: An Empirical Analysis	1718
<i>P. Andrianesis, G. Liberopoulos, G. Kozanidis</i>	
Dimensioning and Grid Integration of Mega Battery Energy Storage System for System Load Leveling	1726
<i>G. Dupont, P. Baltus</i>	
Technical Benefits of Distributed Storage and Load Management in Distribution Grids	1732
<i>E. Veldman, M. Gibescu, J. G. Slootweg, W. L. Kling</i>	

MICROGRIDS – TECHNICAL AND ECONOMIC ISSUES

Multi-Microgrid Impact Assessment Using Multi Criteria Decision Aid Methods	1740
<i>J. Vasiljevska, J. A. Peças-Lopes, M. A. Matos</i>	
Quantification of Economic, Environmental and Operational Benefits of Microgrids	1748
<i>N. D. Hatziaargyriou, A. G. Anastasiadis, J. Vasiljevska, A. G. Tsikalakis</i>	
A Developed Energy Management System for a Microgrid in the Competitive Electricity Market	1756
<i>A. Bagherian, S. M. M. Tafreshi</i>	
A Procedure for Evaluating Microgrids Technical and Economic Feasibility Issues	1762
<i>M. Dicorato, G. Forte, M. Trovato</i>	
Optimization of an Experimental Hybrid Microgrid Operation: Reliability and Economic Issues	1768
<i>A. Milo, H. Gaztañaga, I. Etxeberria-Otadui, E. Bilbao, P. Rodríguez</i>	
Dynamic Behavior Improvement in a Microgrid with Multiple DG Units Using a Power Sharing Approach	1774
<i>M. Shahabi, M-R. Haghifam, M. Mohamadian, S. A. Nabavi-Niaki</i>	
Premium Power Quality with DG Integrated DC systems	1782
<i>M. Brenna, G. C. Lazaroiu, G. Superti-Furga, E. Tironi</i>	
A Microcontroller-Based Automatic Scheduling System for Residential Microgrids	1788
<i>B. Belvedere, M. Bianchi, A. Borghetti, M. Paolone</i>	

A.I. APPLICATIONS IN POWER SYSTEMS: FUZZY LOGIC

Evaluation of the Condition of Medium Voltage Urban Cable Networks using Fuzzy Logic	1794
<i>J. Bühler, G. Balzer</i>	
An Energetic Operation Policy Using Fuzzy Controllers for Maximization of Benefits in the Brazilian Hydrothermal Power System	1802
<i>R. A. L. Rabêlo, A. A. F. M. Carneiro, R. T. V. Braga</i>	
Fuzzy Based Generation Scheduling of Power System with Large Scale Wind Farms	1809
<i>H. Siahkali, M. Vakilian</i>	
Preventing Loop Flows Using Fuzzy Set Theory and Genetic Algorithms	1816
<i>G. O. Dag, M. Bagriyanik</i>	
Improved Fuzzy Load Models by Clustering Techniques in Optimal Planning of Distribution Networks	1821
<i>G. Cartina, G. Grigoras, E. C. Bobric, D. Comanescu</i>	
Clustering Techniques for Energy Losses Evaluation in Distribution Networks	1827
<i>G. Cartina, G. Grigoras, E. C. Bobric</i>	

RENEWABLE ENERGY SYSTEMS

A Solid Oxide Fuel Cell Model to Investigate Load Following and Stability Issues in Distribution Networks	1832
<i>S. Massucco, A. Morini, G. Petretto, A. Pitto, F. Silvestro</i>	
Modeling and Measurement of Small Photovoltaic Systems and Penetration Scenarios	1839
<i>I. T. Papaioannou, M. C. Alexiadis, C. S. Demoulias, D. P. Labridis, P. S. Dokopoulos</i>	
New Network Topologies for Large Scale Photovoltaic Systems	1846
<i>G. Carcangiu, C. Dainese, R. Faranda, S. Leva, M. Sardox</i>	
Storage Selection for DG Applications Containing Virtual Synchronous Generators	1853
<i>M. Albu, K. Visscher, D. Creang, A. Nechifor, N. Golovanov</i>	
Dynamic Modelling of a Grid-Connected PEM Fuel Cell in a Distributed Generation Network	1859
<i>P. N. Papadopoulos, A. G. Marinopoulos, G. K. Papagiannis</i>	

LIGHTNING AND ELECTROMAGNETIC TRANSIENTS

Lightning Attachment Models and Maximum Shielding Failure Current: Application to Transmission Lines	1867
<i>P. N. Mikropoulos, T. E. Tsovilis</i>	
Featuring the Thunderstorm Activity using Lightning Data Provided by the Romanian Lightning Detection and Location Network	1875
<i>I. Baran, S. Stoica</i>	
Critical Feedback on the Methods of Determining the Impact of Lightning on Power System Objects	1883
<i>D. Cristescu, T. Leonida</i>	
The Effects of Lightning Induced Overvoltages on Low Voltage Power Networks	1890
<i>M. Costea, B. Nicoara</i>	
Substation Grounding System Resistance Calculations Using a FEM Approach	1896
<i>V. N. Katsanou, G. K. Papagiannis</i>	
Temporary Overvoltages Due to Ground Faults in MV Networks	1902
<i>A. Cerretti, F. M. Gatta, A. Geri, S. Lauria, M. Maccioni, G. Valtorta</i>	

OPTIMAL POWER FLOW

Sustainability based Optimal Power Flow a New Planning Tool	1910
<i>A. Papaemmanouil, G. Andersson</i>	
Optimal Power Flow Computations with Constraints Limiting the Number of Control Actions	1916
<i>F. Capitanescu, W. Rosehart, L. Wehenkel</i>	
A New Heuristic Approach to Deal with Discrete Variables in Optimal Power Flow Computations	1924
<i>F. Capitanescu, L. Wehenkel</i>	
Optimal Power Flow Solution Using the Penalty/Modified Barrier Method	1932
<i>G. G. Lage, V. A. de Sousa, G. R. M. da Costa</i>	
Ill-conditioned Optimal Power Flow Solutions and Performance of Non-Linear Programming Solvers	1938
<i>M. F. Bedriñana, M. J. Rider, C. A. Castro</i>	
Optimal Power Flow Procedure for Real-time Security and Economic Re-dispatching in a Market Structure	1945
<i>F. Bassi, C. Bruno, P. Crisafulli, G. Giannuzzi, L. Gorello, S. Pasquini, M. Pozzi, R. Zaottini</i>	

SMART GRIDS I

Energy Conservation and SmartGrids: New Challenge for Multimetering Infrastructures	1952
<i>G. Mauri, D. Moneta, C. Bettoni</i>	
Power Flow Management in Active Networks	1957
<i>P. H. Nguyen, W. L. Kling, J. M. A. Myrzik</i>	
A Method to Determine the Distributed Control Setting of Looping Devices for Active Distribution Systems	1963
<i>N. Okada</i>	
Advanced DMS to Manage Active Distribution Networks	1969
<i>F. Pilo, G. Pisano, G. G. Soma</i>	

Assessing Impact of ICT System Quality on Operation of Active Distribution Grids	1977
<i>J. König, L. Nordström</i>	
Short-Term Scheduling of Active Distribution Systems	1985
<i>A. Borghetti, M. Bosetti, S. Grillo, M. Paolone, F. Silvestro</i>	

A.I. APPLICATIONS IN POWER SYSTEMS: EVOLUTIONARY ALGORITHMS

Particle Swarm Optimization Applied to System Restoration	1992
<i>G. Lambert-Torres, H. G. Martins, M. P. Coutinho, C. P. Salomon, F. C. Vieira</i>	
Radial Network Reconfiguration Method in Distribution System using Mutation Particle Swarm Optimization	1998
<i>T. Sawa</i>	
Metering System Planning for State Estimation via Evolutionary Algorithm and H_A Matrix	2004
<i>M. P. Vigliassi, J. B. A. London, A. C. B. Delbem, N. G. Bretas</i>	
Voltage Security Assessment and Control System using a Hybrid Intelligent Method	2010
<i>W. Nakawiro, I. Erlich</i>	
New Evolutionary Methods for Optimal Design of PID Controllers for AVR System	2018
<i>S. M. A. Mohammadi, A. A. Gharaveisi, M. Mashinchi, S. M. R. Rafiei</i>	
A New Meta-heuristic Method for Profit-Based Unit Commitment under Competitive Environment	2026
<i>H. Mori, K. Okawa</i>	
Evolutionary Algorithm EPSO Helping Doubly-Fed Induction Generators in Ride-Through-Fault	2032
<i>H. Leite, J. Barros, V. Miranda</i>	
Energy Restoration in Distribution Systems using Multi-Objective Evolutionary Algorithm and an Efficient Data Structure	2040
<i>M. R. Mansour, A. C. Santos, J. B. A. London, A. C. B. Delbem, N. G. Bretas</i>	

WIDE AREA MONITORING AND CONTROL SYSTEMS

Optimal Input and Output Signal Selection for Wide-Area Controllers	2047
<i>A. M. Almutairi, J. V. Milanović</i>	
Decomposition Algorithm for Power System State Estimation by the Test Equation Technique and Its Implementation on the Basis of Multi-agent Approach	2053
<i>A. Z. Gamm, I. N. Kolosok, A. S. Paltsev</i>	
Multipurpose Open System Architecture Model of Wide Area Monitoring	2060
<i>S. Skok, I. Šturli, R. Matica</i>	
Power System Operation with Wide Area Control Including Real Time ATC Calculation and Power Flow Control	2066
<i>D. Westermann, H. Sauvain</i>	
Wide Area Voltage Regulation & Protection	2071
<i>S. Corsi</i>	
Identification of Topology Errors with Use of Unbalance Indices and Neural Networks	2078
<i>R. Lukomski, K. Wilkosz</i>	

PROTECTION SYSTEMS VI

Fault Location Algorithm for Use with Current Differential Protective Relays of Double-Circuit Line	2086
<i>E. Rosolowski, J. Izykowski, M. M. Saha</i>	
Faults Analysis Theory and Schemes of Four-Phase Power Systems	2092
<i>F. D. Torre, A. Dolara, S. Leva, A. P. Morando</i>	
Modern Fault Location Technique for the Utility	2099
<i>A. Podshivalin, I. Klimatova, E. Terentyev</i>	
Assessment of Fault Location Algorithms in Transmission Grids	2105
<i>M. Istrate, M. Gusa, S. Tibuliac</i>	
A New Genetic Algorithm Method for Optimal Coordination of Overcurrent and Earth Fault Relays in Networks with Different Levels of Voltages	2111
<i>S. S. H. Kamangar, H. A. Abyaneh, R. M. Chabanloo, F. Razavi</i>	
Comparing Measured Impedance by Distance Relay in Presence of Resistive and Inductive Fault Current Limiters	2116
<i>H. Shateri, S. Jamali</i>	

POWER MARKET DESIGN

The Impact of a Given Trading Limit on a Two-Area Test System	2122
<i>M. Perninge, V. Knazkins, M. Amelin, L. Söder</i>	
Distributed System for Dispatching of Generation in Large-Scale Electrical Power Systems	2128
<i>V. A. Makeechev, E. S. Mishuk, O. A. Soukhanov</i>	
Analysis of Market Coupling Based on a Combined Network and Market Model	2134
<i>D. Waniek, C. Rehtanz, E. Handschin</i>	
European Market Couplings: Description, Modelling and Perspectives	2140
<i>J. Louyrette, M. Trotignon</i>	
Functional Requirements for Southwest Power Pool Energy Imbalance Market Dispatch	2146
<i>P. Shamsollahi, V. Van Acker</i>	
Bilateral Contract Correction and Cancellation in the Competitive Electricity Markets	2152
<i>S. Palamarchuk</i>	
Estimation of the Remuneration of Hydro Plants in a Market Environment Using an Iterative Under-Relaxation Approach	2157
<i>J. C. Sousa, V. T. Mendes, J. T. Saraiva</i>	
Effect of Integrating Regulating Power Markets of Northern Europe on Total Balancing Costs	2163
<i>A. Abbasy, R. A. C. van der Veen, R. A. Hakvoort</i>	

RESTRUCTURING OF THE ELECTRICITY INDUSTRY AND TRANSNATIONAL NETWORKS

Equilibrium Pricing of Weather Derivatives in a Multi-Period Trading Environment	2170
<i>Y. Lee, S. S. Oren</i>	
Allocating Production Cost at CHP Plant to Heat and Power using Cooperative Game Theory	2178
<i>V. Neimane, A. Sauhats, G. Vempers, J. Inde, I. Tereskina, G. Bockarjova</i>	
Problems in Electricity Sector Restructuring Policies in Some European Countries in Transition	2184
<i>D. Sabolic, B. Grcic</i>	
Future Electric Power Systems: Structure and Transition Mechanism	2192
<i>M. Y. Vasilyev</i>	
Simulation of Regional Power Markets in the Planning of Trans - Border Interconnections	2197
<i>B. Hadzi-Kostova, L. Oprea, V. Popescu, T. D. Veselka</i>	
Security Assessment by Multiple Transmission System Operators Exchanging Sensitivity and Tie-Line Power Flow Information	2203
<i>D. Fabozzi, M. Glavic, L. Wehenkel, T. Van Cutsem</i>	
Flexible International Exchanges: A Possible Solution for Large – Scale Wind Power Integration	2211
<i>K. Ntotas, M. Gibescu, W. L. Kling, B. C. Ummels, E. Pelgrum</i>	

FUEL SUPPLY ISSUES

Comprehensive Performance and Incertitude Analysis of Multi-Energy Portfolios	2219
<i>F. Kienzle, E. Trutnevyte, G. Andersson</i>	
Efficient Hybrid Optimization Solution for the Economic Dispatch with Nonsmooth Cost Function	2225
<i>I. Ciornei, E. Kyriakides</i>	
Integrated Model of Fuel Supply with Take-or-Pay Contracts for Short-Term Electric Generation Scheduling	2232
<i>J. De La Cruz-Soto, G. Gutiérrez-Alcaraz</i>	
Support Vector Machines (SVM) Based Short Term Electricity Load-Price Forecasting	2239
<i>R. A. Swief, Y. Hegazy, T. S. Abdel-Salam, M. A. Badr</i>	
Considering Start-Up Costs and Risk Premia in a Power Generation Cost Model	2244
<i>T. Mirbach, T. Schuetze</i>	
Modeling and Simulation of Multi-Vector Energy Systems	2250
<i>L. Carradore, R. Turri</i>	

TECHNICAL AND ECONOMICAL ASPECTS OF RES

The Optimal Operation of Distributed Generation Possessed by Community Energy System Considering Low-Carbon Paradigm	2257
<i>H. Shim, S-Y. Kim, J-O. Kim</i>	
Wind Parks' Operation in the Context of System Adequacy	2264
<i>S. Oprea, D. Petresci, M. Anton</i>	
Impact of Renewable Energy Quotas and Emission Trade on Generation Planning	2269
<i>C. Genesi, G. P. Granelli, P. Marannino, M. Montagna, S. Rossi, I. Siviero, L. Desiata, G. Gentile</i>	
Compliance with Technical Codes turns into Precondition for Support and System Services Bonus for Wind Power Plants in Germany	2276
<i>J. Boemer, K. Burges, T. Kumm</i>	
Sensitivity Analysis of the Economic Benefits from Electricity Storage at the End Consumer Level	2284
<i>K-H. Ahlert, C. van Dinther</i>	
Design Conditions of Romanian Power System in the Presence of Large-Scale Wind Power Plants	2292
<i>A. Popescu, H. Albert, C. Serban</i>	

ELECTROMAGNETIC COMPATIBILITY

Measurements and Computation of Electromagnetic Field in Transformer Station 400/110 kV Ernestinovo	2296
<i>S. Nikolovski, Z. Klaić, B. Štefć</i>	
Analysis of the Propagation Characteristics of Buried Cables in Imperfect Earth	2304
<i>T. A. Papadopoulos, D. A. Tsiamitros, G. K. Papagiannis</i>	
EMC Filter Common Mode Resonance	2312
<i>C. M. Lundmark, S. K. Rönnerberg, M. Wahlberg, E. O. A. Larsson, M. H. J. Bollen</i>	
A More Accurate Algorithm and Software to Calculate the Magnetic Induced Voltages in Multiconductor Systems	2318
<i>G. A. Florea, S. Gal, L. Lipan, E. Mateescu, N. Chiosa</i>	
Emission and Immunity of Equipment in the Frequency Range 2 to 150 kHz	2325
<i>E. O. A. Larsson, M. H. J. Bollen</i>	

POWER SYSTEM RISK ASSESSMENT

Condition Assessment for Optimal Planning and Operation of Power Systems with the Aid of Ageing Models	2330
<i>L. Asgarieh, G. Balzer, A. J. Gaul</i>	
A Novel Method to Test the Quality of ADSS Fiber Optic Cables Installed in Transmission Lines	2337
<i>S. Kucuksari, I. Gunes, G. G. Karady</i>	
An Alternative Method for Estimating Mean Life of Power System Equipment with Limited End-of-life Failure Data	2342
<i>J. E. Cota-Felix, F. Rivas-Davalos, S. Maximov</i>	
Risk Assessment of Wind Power Generation Project Investments based on Real Options	2346
<i>J. I. Muñoz</i>	
Assessing the Remaining Life Time of 220 kV and 400 kV OHTL and the Required Measures For the Coordination of Remaining Life Times of the Various Constructive Elements of Lines	2354
<i>G. A. Florea, L. Lipan, S. Gal, E. Kaytar, V. Metiu, I. Rodean</i>	
Life Cycle Cost Analysis of Transmission and Distribution Systems	2361
<i>I. Jeromin, G. Balzer, J. Backes, R. Huber</i>	

POWER SYSTEMS INVESTMENTS

Investment Assessment in Co-Generation with Biomass in the Presence of Uncertainty and Flexibility	2367
<i>W. Uturbey, L. A. Aguilar</i>	
Analyzing the Current U.S. Electricity Transmission System and its Main Caveats to Incentivize Long-term Investments	2375
<i>E. E. Sauma</i>	

Needed Investments in the Power System to Bring Wind Energy to Shore in Belgium	2381
<i>P. Buijs, D. Bekaert, D. Van Hertem, R. Belmans</i>	
A Cost – Benefit Approach for Transmission Investment with a Non-Linear Transmission Cost Function	2387
<i>R. Moreno, C. Vasilakos, D. Pudjianto, G. Strbac</i>	
Distributed Generation and Security of Supply: Assessing the Investment Deferral	2391
<i>D. T-C. Wang, L. F. Ochoa, G. P. Harrison</i>	
Incorporation of Demand Response Resources in Resource Investment Analysis	2399
<i>A. S. Kowli, G. Gross</i>	

POSTER SESSION II

Fault Detection in Induction Motors with Independent Component Analysis (ICA)	2407
<i>I. Guney, E. Kilic, O. Ozgonenel, M. Ulutas, E. Karadeniz</i>	
Low Voltage Ride Through Capability Enhancement of Fixed Speed Wind Generator	2411
<i>S. M. Muyeen, R. Takahashi, T. Murata, J. Tamura</i>	
Optimal Location of Series FACTS Devices to Control Line Overloads in Power Systems with High Wind Feeding	2417
<i>A. D. Shakib, E. Spahic, G. Balzer</i>	
StatCom’s Control by Neural Networks: Results on a Lab Prototype	2424
<i>M. O. Perez, J. M. Ramirez, P. Zúñiga-Haro, O. R. Tapia</i>	
Minimization of Fluctuations of Output Power and Terminal Voltage of Wind Generator by using STATCOM/SMES	2430
<i>M. R. I. Sheikh, S. M. Muyeen, R. Takahashi, T. Murata, J. Tamura</i>	
A Protection and Reconfiguration Scheme for Distribution Networks with DG	2436
<i>S. A. M. Javadian, R. Tamizkar, M-R. Haghifam</i>	
Steady State Operation of Interphase Power Controller (IPC) Using Power Electronic Converter	2444
<i>L. Kalinin, D. Zaitcev, M. Tirsu</i>	
Increase of Paper Mill Energy Efficiency by Optimization Energy Supply System Industry	2450
<i>A. Hazi, A. Badea, G. Hazi, H. Necula, R. Grigore</i>	
New Control Technique for Compensation of Neutral Current Harmonics in Three-Phase Four-Wire Systems	2455
<i>J. K. Zadeh, E. Farjah</i>	
Mathematical Model of Reliability Centered Maintenance (RCM). Power Transmission and Distribution Networks Applications	2461
<i>D. Sarchiz, D. Bica, O. Georgescu</i>	
Optimal Grid Integration of Wind Power Plants in Croatian 110 KV Network	2465
<i>M. Klaric, I. Kuzle</i>	
The Influence of Embedded Generator Control Modes on an Electrical Distribution Network Power Flows and Voltage Profile	2471
<i>A. W. Azizan, V. K. Ramachandaramurthy, C. K. Loo</i>	
Optimal Placement of Monitors in Transmission Systems Using Fuzzy Boundaries for Voltage Sag Assessment	2478
<i>M. Haghbin, E. Farjah</i>	
Evaluating the Impact of Wind Generation on the Reliability of the Electrical Unified Network of Egypt	2484
<i>E. Beshr, Y. Hegazy, Y. Galal, M. A. Badr</i>	
Errors for Calculus of the Energy Losses Using Statistical Characteristics of the Loads in the Busses	2491
<i>G. Hazi, A. Hazi, R. Grigore</i>	
Decreasing the Harmonic Content of the Fault Current during Single-Phase to Ground Faults in Compensated Network	2497
<i>A. Dán, Z. Czira, D. Raisz</i>	
Application of Generalized Neuron in Electricity Price Forecasting	2502
<i>S. Mirzazad-Barijough, A. A. Sahari</i>	
An Investigation on Optimal Current Mode Control for Boost-Type PWM Rectifiers	2507
<i>C. G. Richards, P. J. Ehlers, D. V. Nicolae</i>	
Evaluation of the Steady State Performance of a DC Link Built on VSC Converter Stations Using PSCAD/EMTDC©	2512
<i>E. Mortera-Vázquez, E. L. Moreno-Goytia, L. E. Ugalde-Caballero</i>	
Regional Market Of Balancing Electricity: Technical and Economical Analysis	2518
<i>G. D. Stoilov, S. I. Sulakov</i>	

Electrical Load Analysis in a Hospital Complex	2524
<i>A. Prudenzi, V. Caracciolo, A. Silvestri</i>	

TRANSMISSION CAPACITY ENHANCEMENT AND CONGESTION MANAGEMENT II

A Framework for the Simultaneous Clearing of Multiple Markets within a Common Transmission System	2530
<i>A. Marinakis, W. Rosehart, T. Van Cutsem</i>	
A Rare Event Approach to Build Security Analysis Tools When N-k (k>1) Analyses Are Needed (as They Are in Large Scale Power Systems)	2538
<i>F. Fonteneau-Belmudes, D. Ernst, L. Wehenkel</i>	
Steady-State Solution of a VFT Park Using the Limit Cycle Method and a Reduced Order Model	2546
<i>L. Contreras-Aguilar, N. Garcia</i>	
Power System Adequacy: An Efficient Procedure Based on Genetic Algorithms	2552
<i>F. M. Gatta, A. Geri, S. Lauria, M. Maccioni, P. Masato</i>	
Decision Tree Based Filter for Control Area External Contingencies Screening	2558
<i>K. Alcheikh-Hamoud, N. Hadjsaid, Y. Bésanger, J-P. Rognon</i>	
Power Flow Based Indices for the Coordination of Transmission and Generation System Planning	2566
<i>C. Genesi, P. Marannino, M. Montagna, S. Rossi, I. Siviero</i>	
Towards Quantifying the Impacts of Cyber Attacks in the Competitive Electricity Market Environment	2573
<i>M. Negrete-Pincetic, F. Yoshida, G. Gross</i>	

VOLTAGE STABILITY

Optimal Power Flow with Steady-State Voltage Stability Consideration Using Improved Evolutionary Programming	2581
<i>K. Tangpatiphan, A. Yokoyama</i>	
Voltage Stability in Distribution Networks with DG	2588
<i>M. Alonso, H. Amarís</i>	
Line Indices for Voltage Stability Assessment	2594
<i>C. Reis, F. P. Maciel-Barbosa</i>	
A Multi-Agent Approach to Coordination of Different Emergency Control Devices Against Voltage Collapse	2600
<i>D. A. Panasetsky, N. I. Voropai</i>	
Application of Artificial Immune System for Detecting Overloaded Lines and Voltage Collapse Prone Buses in Distribution Network	2607
<i>J. V. Milanović, J. Lu</i>	
Security Margin Increase by Voltage Stability-Oriented Emergency Power Injection	2614
<i>G. C. Barreto-Mederico, E. Carballo-Henriquez, C. A. Goyo-Barrientos</i>	
Understanding Power System Voltage Collapses Using ARISTO: Effects of Protection	2621
<i>D. Istardi, S. Abba-Aliyu, A. Bergqvist, N. Rouch, A. M. Abdalrahman, L. A. Tuan, L. Bertling</i>	
Evaluation of Some Indices for Voltage Stability Assessment	2628
<i>S. Massucco, S. Grillo, A. Pitto, F. Silvestro</i>	

SYSTEM PROTECTIONS SCHEMES

Damping Modelling in Transformer Energization Studies for System Restoration: Some Standard Models Compared to Field Measurements	2636
<i>M. M. Duró</i>	
Avoiding Cascading Protection Tripping in Transmission Systems and Assessment of Quality and Security of the Protection System	2644
<i>R. Krebs, G. Ziegler, J. Jäger, F. Balasin, F. Lazar</i>	
Application of New Emergency Control Principle in Power Systems	2651
<i>V. Chuvychin, N. Gurov, S. Kiene</i>	
Principles of Protection against Blackouts in Power Systems	2657
<i>J. Barkans, D. Zalostiba</i>	

Defense Plan against Loss of Synchronism in Interconnected Power Systems	2665
<i>U. Häger, C. Rehtanz</i>	
Quantifying the Risk of a Blackout Using PSA/Eurostag Platform Software	2671
<i>F. E. Ciausiu, I. Dumitru, M. Eremia</i>	
Using Hierarchical Coloured Petri Net to Support Substation Restoration	2677
<i>L. A. C. Lisboa, A. M. N. Lima, L. D. Silva</i>	

BIDDING STRATEGIES IN ELECTRICITY MARKETS

Optimal Bidding Strategy of Generating Companies in Imperfect Electricity Markets	2685
<i>M. Kabiri, S. Akbari, N. Amjadi, A. Ketabi, S. A. Taher</i>	
Seller, Buyer and VPP Agents Behavior on a Simulated Electricity Market	2693
<i>I. Praça, H. Morais, C. Ramos, Z. Vale</i>	
A Risk-Constrained Optimal Bidding Strategy for a Generation Company by IWAPSO	2699
<i>C. Boonchuay, W. Ongsakul</i>	
Brazilian Energy Auctions Analysis based on Evolutionary Algorithms	2705
<i>C. M. B. Castro, A. L. M. Marcato, I. C. S. Silva, B. H. Dias, G. E. Silva, E. J. Oliveira</i>	
Incorporation of Rationing Effects to Hydrothermal Dispatch Optimization	2711
<i>A. L. M. Marcato, A. G. Mendes, A. M. Iung, T. C. César, M. Barros, R. C. Souza, A. C. Santos, I. C. S. Silva, R. B. S. Brandi, T. P. Ramos</i>	
Strategic Bidding in Pay as Bid Power Market By Combined Probabilistic and Game Theory Procedures	2719
<i>A. Mozdawar, B. Khaki</i>	

OPTIMAL UNIT COMMITMENT

Market and Environmental Dispatch of Combined Cycle CHP Plant	2725
<i>A. Dolgicers, S. Guseva, A. Sauhats, O. Linkevics, A. Mahnitko, I. Zicmane</i>	
A Model Predictive Control Approach to Dynamic Economic Dispatch Problem	2731
<i>X. Xia, J. Zhang, A. Elaiw</i>	
Long-Term Hydropower Scheduling Based on Deterministic Nonlinear Optimization and Annual Inflow Forecasting Models	2738
<i>M. S. Zambelli, I. Luna, S. Soares</i>	
Assessment of Generators Strategic Behavior in Long Term Supply Contract Auctions using Portfolio Concepts	2746
<i>E. Roubik, H. Rudnick</i>	
Hourly-Discretized Mid-Term Power System Operation in a Competitive Energy Market	2753
<i>C. G. Baslis, A. G. Bakirtzis</i>	
Short-term Hydropower Scheduling Via an Optimization-simulation Decomposition Approach	2759
<i>M. Kadowaki, T. Ohishi, L. S. A. Martins, S. Soares</i>	
Unit Commitment Optimization using Improved Genetic Algorithm	2766
<i>K. Abookazemi, M. W. Mustafa</i>	

ENERGY EFFICIENCY

Loss Reduction as a Mixed Integer Optimization Problem	2772
<i>S. Fliscounakis, F. Zaoui, M-P. Houry, E. Milin</i>	
Energy Loss Estimation in Distribution Networks for Planning Purposes	2778
<i>J. Dickert, M. Hable, P. Schegner</i>	
Optimal Operation of a Microturbine Cluster with Partial-Load Efficiency and Emission Characterization	2784
<i>A-V. Boicea, G. Chicco, P. Mancarella</i>	
Exergy Evaluation of Renewable Use in the Pulp and Paper Industry	2792
<i>A. Hazi, A. Badea, G. Hazi, H. Necula, R. Grigore</i>	
Energy Services As a Tool to Promote Energy Efficiency in the Health Sector	2796
<i>F. Paulo, A. Gomes</i>	

WIND AND MICRO-HYDRO GENERATORS CONTROL

Primary Load-Frequency Control from Pitch-Controlled Wind Turbines	2801
<i>P. Moutis, E. Loukarakis, S. Papathanasiou, N. D. Hatziargyriou</i>	
Optimum Control for an Autonomous Micro Hydro Power Plant with Induction Generator	2808
<i>C. Marinescu, C. P. Ion</i>	
Dynamic Response of Different Wind Generator Topologies Connected to Medium Size Power Grid	2814
<i>M. S. A. Rapheal, V. G. Ram, V. K. Ramachandaramurthy, W. P. Hew</i>	
Methods for Evaluating Penetration Levels of Wind Generation in Autonomous Systems	2820
<i>I. D. Margaritis, J. C. Mantzaris, M. E. Karystianos, A. I. Tsouchnikas, C. D. Vournas, N. D. Hatziargyriou, I. C. Vitellas</i>	
Impact of Distributed Generation in Steady State, Voltage and Transient Stability–Real Case	2827
<i>R. R. Londero, C. M. Affonso, M. V. A. Nunes</i>	
Cross-flow Water Turbines Control Under Grid Disturbances	2833
<i>M. Andreica, S. Bacha, D. Roze, I. Munteanu, A. I. Bratcu, J. Guiraud</i>	

TRANSIENTS AND ELECTROMAGNETIC COMPATIBILITY

Effect of Power Frequency Magnetic Field on Chronic and Genetic Toxicities of Fruit Flies	2839
<i>K. Tanaka, Y. Mizuno, K. Naito</i>	
Halogen Lamp Modeling For Low Voltage Power Systems Transient Analyses.....	2845
<i>O. Craciun, D. Radu, S. Bacha</i>	
Equivalent Lumped Parameter Π-Network of Typical Grounding Systems for Linear and Non-Linear Transient Analysis	2851
<i>F. M. Gatta, A. Geri, S. Lauria, M. Maccioni</i>	
An Original Approach to the Biological Impact of the Low Frequency Electromagnetic Fields and Proofed Means of Mitigation	2857
<i>G. A. Florea, A. Dinca, S. Gal</i>	
Electric and Magnetic Field Distribution in Substations belonging to Transelectrica TSO.....	2865
<i>G. Visan, I. Pop, C. Munteanu</i>	

REACTIVE POWER PLANNING AND CONTROL

Including Active Voltage Level Management in Planning of Distribution Networks with Distributed Generation.....	2870
<i>A. Kulmala, K. Mäki, S. Repo, P. Järventausta</i>	
Optimal Placement of Voltage Regulators in Distribution Systems	2876
<i>C. A. N. Pereira, C. A. Castro</i>	
Optimal Location of Pilot Buses by a Genetic Algorithm Approach for a Coordinated Voltage Control in Distribution Systems	2881
<i>O. Richardot, Y. Bésanger, D. Radu, N. Hadjsaid</i>	
Different Approaches to Short-term Optimal Voltage Scheduling Based On Voltage Control Zones Concept.....	2888
<i>T. Plavšić, I. Kuzle</i>	
Reactive Power Flow Optimization in the Presence of Secondary Voltage Control	2894
<i>V. Ilea, C. Bovo, M. Merlo, A. Berizzi, M. Eremia</i>	

SMART GRIDS II

An Active Coordination Approach for Thermal Household Appliances – Local Communication and Calculation Tasks in the Household.....	2902
<i>S. Koch, D. Meier, M. Zima, M. Wiederkehr, G. Andersson</i>	
Grid Tied Converter with Virtual Kinetic Storage.....	2910
<i>M. P. N van Wesenbeeck, S. W. H. de Haan, P. Varela, K. Visscher</i>	
Balancing Wind Power with Virtual Power Plants of Micro-CHPs	2917
<i>M. Houwing, G. Papaefthymiou, P. W. Heijnen, M. Ilic</i>	
Load Control Through Smart-metering on Distribution Networks	2924
<i>S. Bruno, S. Lamnaca, M. La Scala, G. Rotondo, U. Stecchi</i>	

Development of an RTU for Synchrophasors Estimation in Active Distribution Networks	2932
<i>M. Paolone, A. Borghetti, C. A. Nucci</i>	
Domestic Energy Management Methodology for Optimizing Efficiency in Smart Grids	2939
<i>A. Molderink, V. Bakker, M. G. C. Bosman, J. L. Hurink, G. J. M. Smit</i>	

POWER SYSTEM MAINTENANCE

A De-icing Method of Electric Transmission Line by Adjusting Load Based on Controllable Inductor and Capacitor Compensation	2946
<i>G. Liu, Xz. Zhao, Y. Chen, Sj. Jiang, D. Wang, Z. Liu</i>	
On-Condition Maintenance for Wind Turbines.....	2951
<i>I. Fonseca, T. Farinha, F. P. Maciel-Barbosa</i>	
Diagnosis for Aging Degradation of Insulating Paper in Power Transformers by Measuring the Refractive Index of Cellulose Fibers	2957
<i>M. Yoshida, Y. Konishi</i>	
An Opportunistic Maintenance Optimization Model for Shaft Seals in Feed-Water Pump Systems in Nuclear Power Plants	2962
<i>J. Nilsson, A. Wojciechowski, A-B. Strömberg, M. Patriksson, L. Bertling</i>	
An Optimization Framework for Opportunistic Maintenance of Offshore Wind Power System.....	2970
<i>F. Besnard, M. Patriksson, A-B. Strömberg, A. Wojciechowski, L. Bertling</i>	
Optimization of Maintenance for Power System Equipment Using a Predictive Health Model.....	2977
<i>G. Bajracharya, T. Koltunowicz, R. R. Negenborn, Z. Papp, D. Djairam, B. De Schutter, J. J. Smit</i>	
A Practical Example of Power Transformer Unit Winding Condition Assessment by Means of Short-Circuit Impedance Measurement.....	2983
<i>T. Chiulan, B. Pantelimon</i>	

TRANSMISSION SYSTEM COSTS AND PRICING

Evolution of the Marginal Based Remuneration of the Portuguese Transmission Company from 1998 to 2004.....	2987
<i>J. T. Saraiva, H. F. Dantas</i>	
Impact of Load and Generation Price Uncertainties in Spot Prices.....	2993
<i>B. A. Gomes, J. T. Saraiva, L. M. Neves</i>	
Electricity and CO2 Emissions System Prices Modeling and Optimization	2999
<i>S. Rebennack, N. A. Iliadis, M. V. F. Pereira, P. M. Pardalos</i>	
Modelling of Prices Using the Volume in the Norwegian Regulating Power Market	3005
<i>S. Jaehnert, H. Farahmand, G. L. Doorman</i>	
Usage Based Allocation for Transmission Costs under Open Access.....	3012
<i>L. G. Manescu, D. Rusinaru, P. Dadulescu, V. Anghelina</i>	
Forecasting Electricity Prices in Spot Markets - One Week Horizon Approach	3019
<i>A. F. Duarte, J. N. Fidalgo, J. T. Saraiva</i>	
Transmission Loss Allocation of Bilateral Contracts Using Load Flow Permutations Average Method.....	3025
<i>V. R. Disfani, F. Razavi, B. Kashanizadeh, S. Dargahi</i>	

POWER SYSTEM INSULATION

Determination of the Discharge Current on Distribution Network Surge Arresters.....	3030
<i>C. de Salles, A. F. Picanco, M. L. B. Martinez, H. R. P. M. de Oliveira</i>	
Flashover Performance of 380 kV V-Strings with Composite Insulators under Lightning and Switching Impulses	3036
<i>S. Ilhan, A. Ozdemir</i>	
Analyzing and Comparing Thermal Models of Indoor and Outdoor Oil-Immersed Power Transformers	3042
<i>A. Mamizadeh, I. Iskender</i>	
Absorbent Water Battery set up in the Vat of Oil Transformers	3050
<i>I. Rusu</i>	
Determination of the Saturated Inductance of Transformers by Analytical Formulae, Comparison with an Electromagnetic Field Calculation Approach and Validation by On-site Tests	3053
<i>M. Rioual, Y. Guillot, C. Crépy</i>	

GENERATION PLANNING

A Decision Support Tool for Generation Expansion Planning in Competitive Markets using System Dynamics Models	3059
<i>A. J. C. Pereira, J. T. Saraiva</i>	
Component-based Development Applied to Energetic Operation Planning of Hydrothermal Power Systems	3066
<i>R. A. L. Rabêlo, A. A. F. M. Carneiro, R. T. V. Braga</i>	
Impact of Planning Uncertainties in Power Plant Operation Planning	3074
<i>G. Hinüber, H-J. Haubrich</i>	
GENCOs' Long-Term Expansion Model	3080
<i>D. Hernández-González, G. Gutiérrez-Alcaraz</i>	
Risk-based Strategies for Wind/Pumped-Hydro Coordination under Electricity Markets	3086
<i>F. Bourry, L. M. Costa, G. Kariniotakis</i>	
Dispatch of Head Dependent Hydro Units: Modeling for Optimal Generation in Electricity Market	3094
<i>S. J. P. S. Mariano, M. R. A. Calado, L. A. F. M. Ferreira</i>	

POSTER SESSION III

Modeling Algorithms for Sags with Exponential Fronts and Other Types of Electromagnetic Disturbances from Power Supply Network	3100
<i>G. Gasparese</i>	
Simulations of Power System Dynamic Phenomena	3108
<i>O. Ruhle, F. Balasin</i>	
Power Network System Reliability and Methods of Calculation	3114
<i>A. Kutjuns, L. Zemite</i>	
Estimation of Power System Dominant Modes	3120
<i>A. Cagnano, E. De Tuglie, F. Torelli</i>	
The Modeling of a PEM Fuel Cell – Supercapacitor – Battery System in Dynamic Conditions	3127
<i>F. Ciancetta, E. Fiorucci, A. Ometto, N. Rotondale</i>	
Reliability Evaluation of HV Substations in the Presence of Fault Current Limiter	3132
<i>I. Rahmati, M. Fotuhi-Firuzabad</i>	
Impact of EDRP on Composite Reliability of Restructured Power Systems	3137
<i>R. Azami, A. H. Abbasi, J. Shakeri, A. F. Fard</i>	
Power System Stability Enhancement via STATCOM Supplementary Control Based on Fuzzy Energy Function	3143
<i>A. A. Gharaveisi, A. Hakimi, S. M. R. Rafiei</i>	
Active Substation Design to Maximize DG Integration	3149
<i>A. Goikoetxea, J. A. Barrena, M. A. Rodriguez, G. Abad</i>	
Risk Allocation for Efficient and Timely Transmission Investment under Markets with High Demand Growth	3155
<i>R. Moreno, H. Rudnick</i>	
Interconnection of Electrical Energy Storage Systems for Power Quality Improvement	3160
<i>M. Brenna, G. C. Lazaroiu, R. Rotaru, E. Tironi</i>	
Control Real-Time Flowchart for Symmetrical Components of the Power Systems	3165
<i>S. Costinas, C. Zoller, R. Dobra</i>	

Author Index