

**Editors:**

**Professor José M<sup>a</sup> Zamanillo Sáinz de la Maza, University of Cantabria, Spain**

**Professor Pablo Luis López Espí, Universidad de Alcalá, Spain**

**Professor Aida Bulucea, University of Craiova, Romania**

**HOSTS and SPONSORS:**



**University of Cantabria  
Plaza de la Ciencia s/n.  
39005 Santander, Spain**



**University of Alcalá  
Campus Universitario  
28805 Alcalá de Henares, Spain**



# **POWER SYSTEMS AND POWER TECHNOLOGY**

**Proceedings of the 8th WSEAS International Conference on  
POWER SYSTEMS (PS'08)**

**Santander, Cantabria, Spain, September 23-25, 2008**

**Recent Advances in Electrical Engineering  
A series of Reference Books and Textbooks**

**ISBN: 978-960-474-006-2  
ISSN 1790-5117**

**Published by WSEAS Press  
[www.wseas.org](http://www.wseas.org)**



# **POWER SYSTEMS and POWER TECHNOLOGY**

**Proceedings of the 8th WSEAS International Conference on  
POWER SYSTEMS (PS 2008)**

**Santander, Cantabria, Spain, September 23-25, 2008**

## **HOSTS and SPONSORS:**



University of Cantabria  
Plaza de la Ciencia s/n.  
39005 Santander, Spain



**Universidad  
de Alcalá**

University of Alcalá  
Campus Universitario  
28805 Alcalá de Henares, Spain

Recent Advances in Electrical Engineering  
A series of Reference Books and Textbooks

Published by WSEAS Press  
[www.wseas.org](http://www.wseas.org)

ISSN: 1790-5117  
ISBN: 978-960-474-006-2

# POWER SYSTEMS and POWER TECHNOLOGY

**Proceedings of the 8th WSEAS International Conference on  
POWER SYSTEMS (PS 2008)**

**Santander, Cantabria, Spain, September 23-25, 2008**

## **HOSTS and SPONSORS:**



University of Alcalá  
Campus Universitario  
28805 Alcalá de Henares,  
Spain



University of Cantabria  
Plaza de la Ciencia s/n.  
39005 Santander, Spain

Recent Advances in Electrical Engineering  
A series of Reference Books and Textbooks

Published by WSEAS Press

[www.wseas.org](http://www.wseas.org)

**Copyright © 2008, by WSEAS Press**

All the copyright of the present book belongs to the World Scientific and Engineering Academy and Society Press. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the Editor of World Scientific and Engineering Academy and Society Press.

All papers of the present volume were peer reviewed by two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.  
See also: <http://www.worldses.org/review/index.html>

ISSN: 1790-5117

ISBN: 978-960-474-006-2



World Scientific and Engineering Academy and Society

# **POWER SYSTEMS and POWER TECHNOLOGY**

**Proceedings of the 8th WSEAS International Conference on  
POWER SYSTEMS (PS 2008)**

**Santander, Cantabria, Spain, September 23-25, 2008**

## **HOSTS and SPONSORS:**



University of Cantabria  
Plaza de la Ciencia s/n.  
39005 Santander, Spain



**Universidad  
de Alcalá**

University of Alcalá  
Campus Universitario  
28805 Alcalá de Henares, Spain

## **Editors:**

Professor José M<sup>a</sup> Zamanillo Sáinz de la Maza, University of Cantabria, Spain  
Professor Pablo Luis López Espí, Universidad de Alcalá, Spain  
Professor Aida Bulucea, University of Craiova, Romania

## International Program Committee Members:

Irwin W. Sandberg, USA  
Asad A. Abidi, USA  
Andreas Antoniou, USA  
Antonio Cantoni, AUSTRALIA  
Lotfi Zadeh, USA  
George Szentirmai, USA  
Michael Peter Kennedy, IRELAND  
Paresh C. Sen, CANADA  
Michel Gevers, BELGIUM  
James S. Thorp, USA  
Armen H. Zemanian, USA  
Guanrong Chen, HONG KONG  
Edgar Sanchez-Sinencio, USA  
Jim C. Bezdek, USA  
A. J. van der Schaft, the NETHERLANDS  
Istvan Nagy, Hungary  
Wasfy B. Mikhael, USA  
M. N. S. Swamy, CANADA  
M. Araki, JAPAN  
Abbas El Gamal, USA  
Franco Maloberti, Italy  
Alan N. Willson Jr., USA  
Yoji Kajitani, JAPAN  
Mohammed Ismail, USA  
Kemin Zhou, USA  
Ruey-Wen Liu, USA  
Nabil H. Farhat, USA  
John I. Sewell, UK  
Jerry M. Mendel, USA  
Magdy A. Bayoumi, USA  
Bertram E. Shi, HONG KONG  
M. Omair Ahmad, CANADA  
N. K. Bose, USA  
Igor Lemberski, LATVIA  
Alfred Fettweis, GERMANY  
Brockway McMillan, USA  
H. J. Orchard, USA  
Jacob Katzenelson, ISRAEL  
Vincent Poor, USA  
Abraham Kandel, USA  
Bor-Sen Chen, CHINA  
C. S. George Lee, USA  
Hamid R. Berenji, USA  
Kevin M. Passino, USA  
Lawrence O. Hall, USA  
Ronald R. Yager, USA  
Witold Pedrycz, CANADA  
Agoryaswami J. Paulraj, USA  
Ahmed H. Tewfik, USA  
Alan V. Oppenheim, USA  
Alfonso Farina, ITALY  
Alfred O. Hero, USA  
Ali H. Sayed, USA  
Anders Lindquist, SWEDEN  
Arthur B. Baggeroer, USA  
Arye Nehorai, USA  
Benjamin Friedlander, USA  
Bernard C. Levy, USA  
Bhaskar D. Rao, USA  
Bin Yu, USA  
Boualem Boashash, AUSTRALIA  
Brian D. O. Anderson, AUSTRALIA  
Bruce A. Francis, CANADA  
C. Richard Johnson, USA  
C. Sidney Burrus, USA  
Charles M. Rader, USA  
Desmond P. Taylor, NEW ZEALAND  
Donald L. Duttweiler, USA  
Donald W. Tufts, USA  
Douglas L. Jones, USA  
Earl E. Swartzlander, USA  
Ed F. Deprettere, the NETHERLANDS  
Edward A. Lee, USA  
Edward J. Powers, USA  
Ehud Weinstein, ISRAEL  
Eli Brookner, USA  
Ezio Biglieri, Italy  
Faye Boudreaux-Bartels, USA  
Georgios B. Giannakis, USA  
Gonzalo R. Arce, USA  
H. Vincent Poor, USA  
Hagit Messer, ISRAEL  
John V. McCanny, UK  
Joos Vandewalle, BELGIUM  
Jose C. Principe, USA  
Jose M. F. Moura, USA  
K. J. Ray Liu, USA  
Kaushik Roy, USA  
Kenneth Rose, USA  
Keshab K. Parhi, USA  
Kon Max Wong, CANADA  
Kung Yao, USA  
Louis L. Scharf, USA  
Martin Vetterli, USA  
Mati Wax, USA  
Meir Feder, ISRAEL  
Michael C. Wicks, USA  
Michael D. Zoltowski, USA  
Michael T. Orchard, USA  
Michael Unser, SWITZERLAND  
Miguel Angel Lagunas, SPAIN  
Moeness G. Amin, USA  
Mohamed Najim, FRANCE  
Neil J. Bershad, USA  
P. P. Vaidyanathan, USA  
Patrick Dewilde, NETHERLANDS  
Peter Willett, USA  
Petre Stoica, SWEDEN  
Phillip A. Regalia, FRANCE  
Pierre Duhamel, FRANCE  
Pierre Moulin, USA  
Pramod K. Varshney, USA



Rabab Kreidieh Ward, CANADA  
 Robert M. Gray, USA  
 Rolf Unbehauen, GERMANY  
 Ronald W. Schafer, USA  
 Rui J. P. Figueiredo, USA  
 Russell M. Mersereau, USA  
 Sadaoki Furui, JAPAN  
 Shun-Ichi Amari, JAPAN  
 Simon Haykin, CANADA  
 Soo-Chang Pei, CHINA  
 Soura Dasgupta, USA  
 Stefan L. Hahn, POLAND  
 Steven Kay, USA  
 Takao Hinamoto, JAPAN  
 Takashi Matsumoto, JAPAN  
 Tapio Saramaki, FINLAND  
 Tariq S. Durrani, U.K.  
 Thomas F. Quatieri, USA  
 Thomas L. Marzetta, USA  
 Thomas S. Huang, USA  
 Thomas W. Parks, USA  
 Uri Shaked, ISRAEL  
 V. John Mathews, USA  
 Vladimir Cuperman, USA  
 William A. Pearlman, USA  
 Wolfgang Fichtner, SWITZERLAND  
 Wu-Sheng Lu, CANADA  
 Yaakov Bar-Salom, USA  
 Yingbo Hua, USA  
 Yong Ching Lim, SINGAPORE  
 Yoram Bresler, USA  
 Zhi Ding, USA  
 A. A. Goldenberg, CANADA  
 Angel Rodriguez-Vasquez, SPAIN  
 Erol Gelenbe, USA  
 F. L. Lewis, USA  
 Harry Wechsler, USA  
 Howard C. Card, CANADA  
 Lei Xu, P. R. CHINA  
 Leon O. Chua, USA  
 Marco Gori, ITALY  
 Narasimhan Sundararajan, SINGAPORE  
 Sankar K. Pal, India  
 Tamas Roska, USA  
 A. Stephen Morse, USA  
 Alberto Isidori, USA  
 Ali Saberi, USA  
 Andrew R. Teel, USA  
 Antonio Vicino, ITALY  
 Anuradha M. Annaswamy, USA  
 Benjamin Melamed, USA  
 Bruce H. Krogh, USA  
 David D. Yao, USA  
 Donald Towsley, USA  
 Eduardo D. Sontag, USA  
 Edward J. Davison, CANADA  
 G. George Yin, USA  
 Giorgio Picci, ITALY  
 Graham C. Goodwin, AUSTRALIA  
 Han-Fu Chen, CHINA  
 Harold J. Kushner, USA  
 Hidenori Kimura, JAPAN  
 Ian Postlethwaite, UK  
 Ian R. Petersen, AUSTRALIA  
 Jan C. Willems, NETHERLANDS  
 Jim S. Freudenberg, USA  
 Karl Johan Astrom, SWEDEN  
 Lennart Ljung, SWEDEN  
 M. Vidyasagar, INDIA  
 Mark W. Spong, USA  
 Matthew R. James, AUSTRALIA  
 Munther A. Dahleh, USA  
 P .R. Kumar, USA  
 Peter E. Caines, CANADA  
 Pramod P. Khargonekar, USA  
 Richard T. Middleton, AUSTRALIA  
 Roberto Tempo, Italy  
 Roger W. Brockett, USA  
 Romeo Ortega, FRANCE  
 Shankar Sastry, USA  
 Stephane Lafortune, USA  
 Steven I. Marcus, USA  
 T. E. Duncan, USA  
 Tamer Basar, USA  
 W. M. Wonham, CANADA  
 Weibo Gong, USA  
 Xi-Ren Cao, Hong Kong  
 Yu-Chi Ho, United Kingdom  
 Maricel Adam, ROMANIA  
 Mohd. Hasan, Ali KOREA  
 Fuad Alkoot, KUWAIT  
 Atef Al-Najjar, SAUDI ARABIA  
 Horia Andrei, ROMANIA  
 Alexandre Rasi, Aoki BRAZIL  
 Francisco Aparisi, SPAIN  
 Junichi Arai, JAPAN  
 Enrique Arce-Medina, MEXICO  
 Bhed Bahadur, Bista JAPAN  
 Razvan Bologa, ROMANIA  
 Chung Chang, TAIWAN  
 Tianzhou Chen, CHINA  
 Ting-yu Chen, TAIWAN  
 Ali Dastfan, IRAN  
 Darie Eleonora, ROMANIA  
 Huaiguo Fu, IRELAND  
 Hiroyuki Goto, JAPAN  
 Jyh-cherng Gu, TAIWAN  
 Jihong Han, CHINA  
 Athanasios Hatzigaidas, GREECE  
 Aghileh Heidari, IRAN  
 Jung-wen Hsia, TAIWAN  
 Yu-Jung Huang, TAIWAN  
 Supachate Innet, THAILAND  
 Dimitris Iraclous, GREECE

Shabiul Islam, MALAYSIA  
Gangyi Jiang, CHINA  
Ahad Kazemi, IRAN  
Cheong Kim, KOREA  
Thanatchai Kulworawanichpong, THAILAND  
Suwat Kuntanapreeda, THAILAND  
Marek Kurzynski, POLAND  
Yangwon Kwon, KOREA  
Heungjae Lee, KOREA  
Tsang-Hsiung Lee, TAIWAN  
Xiaolu Li, CHINA  
Hengwuli Li, CHINA  
Robert Lis, POLAND  
Hongzhe Liu, CHINA  
Jia-Jiunn Lo, TAIWAN  
Ana-Ramona Lupu, ROMANIA  
Ramezanali Mahdavinejad, IRAN  
Nashat Mansour, LEBANON  
Boonruang Marungsri, THAILAND  
Nikos Mastorakis, GREECE  
Tetsushi Miki, JAPAN  
Mohammad reza Mollahoseini, IRAN  
Dan El Montoya, VENEZUELA  
Francesco Moschella, ITALY  
Francesco Muzi, ITALY  
Fumio Nishiyama, JAPAN  
Anant Oonsivilai, THAILAND  
Andrey Osipov, RUSSIA  
Padej Pao-la-or, THAILAND  
Suraj Pardeshi, INDIA  
Sanda Victorinne Paturca, ROMANIA  
Carlos Pedreira, BRAZIL  
Edward Puchala, POLAND  
Pallikonda Ravi Babu, INDIA  
Carolina Regoli, VENEZUELA

Chen Rong-Chang, TAIWAN  
Ahmet Sezer, TURKEY  
Shiva Shavandi, IRAN  
Miguel Strefezza, VENEZUELA  
Sueo Sugimoto, JAPAN  
Supaporn Suwannarongsri, THAILAND  
Kiyoharu Tagawa, JAPAN  
Tsuyoshi Takayama, JAPAN  
Sun-Yen Tan, TAIWAN  
Shu bin Tan, CHINA  
Sejid Teynjak, CROATIA (HRVATSKA)  
Michael Theodoridis, GREECE  
Dat Tran, AUSTRALIA  
Sirirut Vanichayobon, THAILAND  
Xun Wang, CHINA  
En-Rong Wang, CHINA  
Ning Wang, CHINA  
Shugang Wei, JAPAN  
Riyu Wei, AUSTRALIA  
Wiphada Wettayaprasit, THAILAND  
Khoi Loon Wong, AUSTRALIA  
Chi-Jui Wu, TAIWAN  
Fuli Wu, CHINA  
Peng Wu, CHINA  
Li Xiao, CHINA  
Weiwei Xing, CHINA  
Zhiguang Xu, UNITED STATES  
Likang Yang, SWEDEN  
Liu Yongqi, CHINA  
Haslinda Zabiri, MALAYSIA  
Mohamed Zahran, EGYPT  
Chao Zhang, CANADA  
Xingping Zhang, CHINA  
Yanlei Zhao, CHINA  
Jin Zhu, KOREA

## **Preface**

This book contains the proceedings of the 8th WSEAS International Conference on POWER SYSTEMS (PS 2008) which was held in Santander, Cantabria, Spain, September 23-25, 2008. This conference aims to disseminate the latest research and applications in Power System Planning and Management, Portable Power Systems, Power Factor Compensation and Conditioning, Control strategies and other relevant topics and applications.

The friendliness and openness of the WSEAS conferences, adds to their ability to grow by constantly attracting young researchers. The WSEAS Conferences attract a large number of well-established and leading researchers in various areas of Science and Engineering as you can see from <http://www.wseas.org/reports>. Your feedback encourages the society to go ahead as you can see in <http://www.worldses.org/feedback.htm>

The contents of this Book are also published in the CD-ROM Proceedings of the Conference. Both will be sent to the WSEAS collaborating indices after the conference: [www.worldses.org/indexes](http://www.worldses.org/indexes)

In addition, papers of this book are permanently available to all the scientific community via the WSEAS E-Library.

Expanded and enhanced versions of papers published in this conference proceedings are also going to be considered for possible publication in one of the WSEAS journals that participate in the major International Scientific Indices (Elsevier, Scopus, EI, ACM, Compendex, INSPEC, CSA .... see: [www.worldses.org/indexes](http://www.worldses.org/indexes)) these papers must be of high-quality (break-through work) and a new round of a very strict review will follow. (No additional fee will be required for the publication of the extended version in a journal). WSEAS has also collaboration with several other international publishers and all these excellent papers of this volume could be further improved, could be extended and could be enhanced for possible additional evaluation in one of the editions of these international publishers.

Finally, we cordially thank all the people of WSEAS for their efforts to maintain the high scientific level of conferences, proceedings and journals.



## Table of Contents

<b>Plenary Lecture I: Sustainability Issues for Electric Transportation Systems</b> <i>Cornelia Aida Bulucea</i>	<b>13</b>
<b>Plenary Lecture II: Switching Transient Phenomena in Power Systems at the 400 KV High Voltage Unloaded Line</b> <i>Petre Tusaliu</i>	<b>15</b>
<b>An Optimal Cost-benefit Method for the Reinforcement of the Hellenic Medium Voltage Distribution Lines</b> <i>L. Ekonomou and D.S. Oikonomou</i>	<b>17</b>
<b>Load Flow Solution of Radial Distributions Networks with ZI Loads</b> <i>Antonino Augugliaro, Luigi Dusonchet, Salvatore Favuzza, Mariano G. Ippolito, Eleonora Riva Sanseverino</i>	<b>22</b>
<b>Protection of Energetic Transformers on the Side of 400 kV from Overvoltage through Arresters Metal – Oxide MO and their Modeling</b> <i>Jusuf Krasniqi and Vezir Rexhepi</i>	<b>28</b>
<b>A Few Aspects Concerning the On-voltage Working Techniques Applied at S.T. Timisoara, as a Way of Reducing All Maintenance Costs and to Increase the Availability of the Power Lines</b> <i>Doru Vatau, Flaviu Frigura, Constantin Barbulescu and Sorin Musuroi</i>	<b>34</b>
<b>Application of Genetic Algorithm to Distribution Network Expansion Planning with Distributed Generation</b> <i>Majid Gandomkar</i>	<b>40</b>
<b>Damping Inter-Area Oscillations by UPFC Considering Effect of Inertia Coefficient</b> <i>A. Kazemi and M.R. Shadmegaran</i>	<b>46</b>
<b>Effects of Power Oscillations Damping Controllers by UPFC Using Different Fault Conditions</b> <i>A. Kazemi and F. Mahamnia</i>	<b>54</b>
<b>Power System Dynamic Restoration Planning</b> <i>Osamah A. Alsayegh</i>	<b>60</b>
<b>General Control Methodology for Interconnected Mini-Grids</b> <i>Egon Ortjohann, Worpong Sinsukthavorn, Alaa Mohd, Max Lingemann, Nedzad Hamsic, Andreas Schmelter and Danny Morton</i>	<b>66</b>
<b>Transmission Cost Allocation Methods. Case study for the South-West side of the Romanian Power System</b> <i>Constantin Barbulescu, Gheorghe Vuc, Stefan Kilyeni, Petru Andea and Dan Jigoria-Oprea</i>	<b>72</b>
<b>Development of UMP's Electric Vehicle: Power Consumption Modelling</b> <i>Ruhaizad Ishak and Rosmadi Abdullah</i>	<b>78</b>

<b>Reactive Power Profiles</b>	<b>81</b>
<i>Martin Wolter</i>	
<b>A Quickly Method to Estimate Harmonic Conditions Changes in a Bus of an Electrical Network, as a Result of Transversal Impedance Installation</b>	<b>89</b>
<i>Adrian Pana and Alexandru Baloi</i>	
<b>Study about Electromagnetic Compatibility of Line Frequency Coreless Induction Furnaces</b>	<b>95</b>
<i>Angela Iagăr, Gabriel Nicolae and Popa Ioan Șora</i>	
<b>Practical Load Following Operation of NAS Battery</b>	<b>101</b>
<i>Yusuke Hida, Ryuichi Yokoyama, Kenji Iba and Kouji Tanaka</i>	
<b>A New Static Network Reduction Technique Based on REI Equivalentents and Genetic Optimization</b>	<b>106</b>
<i>Mihai Gavrilas, Ovidiu Ivanov and Gilda Gavrilas</i>	
<b>Congestion Management and Identification of Wheeling Paths by an Extended Sensitivity Analysis</b>	<b>112</b>
<i>Hiromu Hamada, Yuta Sano and Ryuichi Yokoyama</i>	
<b>Hybrid Intelligent Voltage and Reactive Power Control System for Jeju Power System in Korea</b>	<b>118</b>
<i>Wonkun Yu, Heungjae Lee, Don Hur, Chanho Lim, Taekyun Kim, Jeonghoon Shin and Soochul Nam</i>	
<b>Ancillary Services in Deregulated Power Systems</b>	<b>124</b>
<i>Nikola Švigir, Igor Kuzle and Darjan Bošnjak</i>	
<b>Switching Transient Phenomena in Power Systems at the 400 kv High Voltage Unloaded Line</b>	<b>131</b>
<i>P. Tusaliu, M. Perpelea, G. Curcanu, D. C. Tusaliu, E. Stoenescu and A. Ozdemir</i>	
<b>A New Structure for the Fuzzy Logic Control in DC to DC Converters</b>	<b>137</b>
<i>Jenica Ileana Corcau and Eleonor Stoenescu</i>	
<b>Controller Based, Voltage Regulated, Sine Wave Inverter Design with Feedback</b>	<b>142</b>
<i>Awais Amin, Abdul Manan and Mahveen Khalid</i>	
<b>Simulation Software of the Voltage Sags Effects on Power System Loads</b>	<b>148</b>
<i>Mihai Moga, Florin Molnar-Matei and Lucian Dale</i>	
<b>New Modified Real Power Flow Sensitivity Based Congestion Management and Impact of TCPAR Using MINLP</b>	<b>154</b>
<i>Ashwani Kumar Sharma and S. Chanana</i>	
<b>The Effect of Defuzzification Method Type on the Fuzzy Logic Control of DC to DC Converters</b>	<b>160</b>
<i>Jenica Ileana Corcau, Eleonor Stoenescu and Alexandru Tudosie</i>	

<b>Assessment of Achieved Energy in Electrical Transportation Systems</b>	<b>164</b>
<i>Cornelia Aida Bulucea, Doru Adrian Nicola, Constantin Brandusa, Daniel Cristian Cismaru, Laurentiu Alboteanu and Andreea Brandusa</i>	
<b>Fuzzy Control of Electrical Drives</b>	<b>172</b>
<i>Constantin Volosencu</i>	
<b>New Converter Controller Model for Modeling of Microturbine Based Distributed Generation System</b>	<b>181</b>
<i>P. Sharath Kumar, S. P. Jain and Ashwani Kumar Sharma</i>	
<b>Modelling and Simulation of a Stand-alone Photovoltaic System</b>	<b>189</b>
<i>Ionel Laurentiu Alboteanu, Sergiu Ivanov and Gheorghe Manolea</i>	
<b>Uncertainty Assessment of Incremental Transmission Loss Factors</b>	<b>195</b>
<i>P. M. De Oliveira-De Jesus, M. A. Alvarez, M. T. Ponce de Leao and J. M. Yusta</i>	
<b>Improving Dynamic Performance of a Segmented Current Steering Digital-to-Analog Converter</b>	<b>201</b>
<i>Lucian Jurca, Constantin Volosencu, Mircea Tomoroga and Ioan Filip</i>	
<b>Simulation Algorithm Developed to Investigate the Effects of Various Rotor Faults in Cage Rotor Induction Machines</b>	<b>205</b>
<i>Lucian Mihet-Popa, Constantin Volosencu, Lucian Jurca, Octavian Prostean and Iosif Szeidert</i>	
<b>Sustainability Concepts in Analysis of Electric Trains with Traction Induction Motors Fed from DC Line</b>	<b>210</b>
<i>Doru Adrian Nicola, Cornelia Aida Bulucea, Daniel Cristian Cismaru, Constantin Brandusa, Gheorghe Manolea and Dragos Pasculescu</i>	
<b>Application of MPCG Algorithm in the Complex Three Dimensional Electric Field Calculation</b>	<b>218</b>
<i>Ma Ai-qing and Jiang Xiu-chen</i>	
<b>Stator Winding Fault Diagnosis in DC Motors during Manufacturing using Electromagnetic and Thermal Monitoring</b>	<b>223</b>
<i>M. Manana, A. Ortiz, C. Renedo, S. Perez and F. Delgado</i>	
<b>Determination of New Power Components for Non-sinusoidal Conditions</b>	<b>228</b>
<i>A. Ortiz, M. Manana, C. Renedo, S. Perez and F. Delgado</i>	
<b>Irreversible Cycles Analysis and Optimization</b>	<b>236</b>
<i>Gheorghe Dumitraşcu</i>	
<b>LMP Based Zone Formation in Electricity Markets</b>	<b>242</b>
<i>Saurabh Chanana, Ashwani Kumar and Rahul Srivastava</i>	
<b>Pattern Recognition of GIS Defects Based on Envelope Characteristics of UHF Signal</b>	<b>247</b>
<i>Li Li-xue, Huang Cheng-jun, Zeng Yi and Jiang Xiu-chen</i>	

<b>Leakage Current Monitoring of Distribution Line Spacers</b>	<b>252</b>
<i>Walter Pinheiro, Arnaldo G. Kanashiro and Geraldo F. Burani</i>	
<b>Optimum Arrangement for Photovoltaic Arrays in the Tropics</b>	<b>258</b>
<i>K. Sopian, M. Yahya, M.Y.Othman, M. A. Alghoul, M.A.M. Teridi and A. Zaharim</i>	
<b>Optimum Arrangement of Photovoltaic Panels for BIPV Application</b>	<b>265</b>
<i>K. Sopian, M. Yahya, M. Y.Othman, M. A. Alghoul, M.A.M.Teridi and A. Zaharim</i>	
<b>Optimization of Renewable Energy Hybrid System</b>	<b>271</b>
<i>Juhari AB. Razak, Kamaruzzaman Sopian, M. Yahya Yusoff Ali, Mohammad Ahmed Alghoul and A. Zaharim</i>	
<b>“On Line” Control of a Power Process. Fuzzy-logic Applications</b>	<b>277</b>
<i>Doru Vatau, Flaviu Frigura, Constantin Barbulescu and Sorin Musuroi</i>	
<b>Demand Predicting In Distribution System Using Neuro-Fuzzy Techniques</b>	<b>281</b>
<i>S. Mohammadi</i>	
<b>Fire Angle Control of TCR and TSC for Reactive Power Control in Order to Reduce Harmonics Using Neural Network</b>	<b>287</b>
<i>Z. Haidari</i>	
<b>DSM Techniques and Fuzzy logic Application to Air Conditioner - a Case Study</b>	<b>292</b>
<i>P.Ravi Babu, A. Praveen, P. Rashmi Reddy, Vikas Chandra.Ch and Karthik Ravi Teja.M</i>	
<b>Significance of Absorber Thickness Reduction in CdTe Thin Film Solar Cells for Promising Terrestrial Usage – From the Perspective of Numerical Analysis</b>	<b>299</b>
<i>Nowshad Amin, Kamaruzzaman Sopian, M. Yahya and A. Zaharim</i>	
<b>Performance of a Solar Assisted Dehumidification System for Centella Asiatica L</b>	<b>306</b>
<i>M. Yahya, K. Sopian , W. R. W. Daud , M. Y. Othman and B. Yatim</i>	
<b>Author Index</b>	<b>313</b>

## Plenary Lecture I

### Sustainability Issues for Electric Transportation Systems



**Professor Cornelia Aida Bulucea**

Electrical Machines and Environment Engineering Department  
Faculty of Engineering in Electromechanics and Environment  
University of Craiova  
ROMANIA

E-mail: abulucea@gmail.com

**Abstract:** The Universe Powers let us discover a part of their laws. We can not change the Nature laws but we must know and respect them. The human engineering actions and the living nature can not anymore be separated because the future survival of the society is strongly depending on physical, environmental and human resources. Scientists and public authorities around the world are realizing that human actions have to be responsible regarding not only the social and economic matters, but also the environment issues. The environmental problems are mainly consequences from a too strong belief in traditional engineering and economic growth as the solution. The first human intelligence step against ignorance would be to understand that the real world processes involving energy and matter need to be linked both to the engineering design and operation, and to the environment issues. For the moment, our correct activities must be referred into the frame of Sustainable Development that is encompassing three general areas, concerning the economical development, the environmental issues and the social protection problems. On a broader front, an utmost human world priority should be the improvement of public transportation systems. The merit of an electric transportation system is based not only on technical performance, safety, energy efficiency, economic acceptance but also on sustainability and exergy efficiency. This study emphasizes a number of sustainability-based concepts, such as achieved energy, embodied energy and exergy, related as tools in order to describe, analyse and optimize the energy conversion in the electric transportation systems. Costs should reflect value and value is not associated with energy but with exergy and sustainability. Hence, the main aim of this investigation is to assess the sustainability of modern electric transportation systems, based both on electrical engineering analysis and on further alternative knowledge. An Electric Railway System should be considered a component of the Sustainable Development architecture if it meets certain criteria: a strong train operation safety, a high reliability of the electric supply and an increased exergy efficiency of the transportation system. In the paper only the urban railway vehicles with electric motors at wheels, operating in traction and electric brake regimes are taken into account. This study aimed at examining an underground railway train viewed as a system where different energy forms occur, so that the successive energy conversion chain is emphasized and the energy and exergy efficiencies, respectively, are compared. The exergy dynamic approach in that case study assessed interesting results concerning the electric trains sustainability in traction and electric brake regimes, emphasizing the negative effects of exergy destruction and the corresponding longterm environmental impact.

**Brief Biography of the Speaker:** Cornelia Aida Bulucea is currently an Associate Professor in Electrotechnics, Electrical Machines and Environment Electrical Equipments in the Faculty of Engineering in Electromechanics and Environment, University of Craiova, Romania. She is graduate from the Faculty of Electrical Engineering Craiova and she received the Ph.D degree from Bucharest Polytechnic Institute. In Publishing House she is author of four books in electrical engineering area. Research work is focused on improved solutions for electrical networks on basis of new electric equipments and environmental impact of energy and electric transportation systems. She has extensive experience in both experimental and theoretical research work, certified by over 40 journal and conference

research papers and 11 research projects from industry. She has held in the Association for Environment Protection OLTENIA and she is a regular invited keynote lecture for environmental engineering symposia organized by Chamber of Commerce OLTENIA. Due to WSEAS recognition as high scientific Forum she participated in three WSEAS International Conferences, presenting papers and chairing sessions. She is very proud of her two papers published in WSEAS TRANSACTIONS on ENVIRONMENT and DEVELOPMENT August 2007 and March 2008, respectively.



## Plenary Lecture II

### Switching Transient Phenomena in Power Systems at the 400 KV High Voltage Unloaded Line



**Professor Petre Tusaliu**

Electrical Faculty, University of Craiova  
ROMANIA

E-mail: ptusaliu@elth.ucv.ro

**Abstract:** In this paper, there are evaluated the transient phenomena in power systems at the 400 kV high voltage operations, which appear at the unloaded line switching. In point of news, the paper presents the modelling and simulation of an unloaded three-phase line switching effect in Power System, using PSCAD Program and MathCAD Program. There were obtained the transient recovery voltages (TRV), the overcurrents (OC) in the 400 kV network and the electrical field (EF), according with the overvoltages (OV) at 400 kV. After that, a comparatively analyse of results is made. The paper presents the electrical field values, according to modelled and simulated disturbances. The simulation was performed using the EMTDC/PSCAD software package, in order to obtain the electromagnetic disturbances in the transmission line and in the busbars. The proposed simulation is applied for an unload transmission line connected between KEPEZ and YATAGAN in 380 kV Turkish National Power Transmission Systems. Also, in the paper are presented modelling, simulations, measurements and experiments performed for determination of switching overvoltages at the 400 kV unloaded lines switching in a Romanian Network (Tintareni-Sibiu). After that, a comparative analysis of results regarding switching overvoltages determined through modelling and experiments is made and conclusions about admissible limits recommended by the CIGRE and IEEE international norms are established.

**Brief Biography of the Speaker:** Petre Tusaliu is full professor at University of Craiova, Romania and President of the "High Voltages Engineering, Environment & Life" Scientific Professional Association. He is doctor in "switching transient phenomena". His Research activity is in area: high voltages engineering, transient phenomena, power systems, electromagnetic compatibility. He is author and joint author of over 150 works of their area, has 7 invention and innovation patents, 9 works for Education and 4 books published. He is Editor al "CHALLENGES IN POWER, HIGH VOLTAGES and MACHINES", published by WSEAS Press, Venice, Italy, November, 2007. He was CIGRE member (5 years) and their Curriculum vitae and activity have been included in "The International Directory of Distinguished Leadership, 1997", edited by "American Biographical Institute". Also, he have received the title "Man of the Year-1997", awarded by "American Biographical Institute-North Carolina-USA". He was specialising in Germany and, in last years, he has effectuated three International scientific research grants, in co-operation at the NATO Scientific Research Programmes in the European Universities. He has participated as member of many "Steering Committee", "Editorial Board", "Chairperson" and "Papers Reviewer" of the numerous International Conferences. He was plenary speaker at "the eighth IASTED International Conference on POWER AND ENERGY SYSTEMS, June 23-25, 2008, Corfu, Greece".

## Author Index

Abdullah, R.	78	Hida, Y.	101
Ai-qing, M.	218	Hur, D.	118
Alboteanu, I. L.	189	Iagar, A.	95
Alboteanu, L.	164	Iba, K.	101
Alghoul, M. A.	258, 265, 271	Ippolito, M. G.	22
Ali, Y.	271	Ishak, R.	78
Alsayegh, O. A.	60	Ivanov, O.	106
Alvarez, M. A.	195	Ivanov, S.	189
Amin, A.	142	Jain, S. P.	181
Amin, N.	299	Jigoria-Oprea, D.	72
Andea, P.	72	Jurca, L.	201, 205
Augugliaro, A.	22	Kanashiro, A. G.	252
Babu, P. R.	292	Kazemi, A.	46, 54
Baloi, A.	89	Khalid, M.	142
Barbulescu, C.	34, 72, 277	Kilyeni, S.	72
Bosnjak, D.	124	Kim, T.	118
Brandusa, A.	164	Krasniqi, J.	28
Brandusa, C.	164, 210	Kumar, A.	242
Bulucea, C. A.	164, 210	Kumar, P. S.	181
Burani, G. F.	252	Kuzle, I.	124
Chanana, S.	154, 242	Lee, H.	118
Chandra.Ch, V.	292	Lim, C.	118
Cheng-jun, H.	247	Lingemann, M.	66
Cismaru, D. C.	164, 210	Li-xue, L.	247
Corcau, J. I.	137, 160	Mahamnia, F.	54
Curcanu, G.	131	Manan, A.	142
Dale, L.	148	Manana, M.	223, 228
Daud, W. R. W.	306	Manolea, G.	189, 210
De Leao, M. T. P.	195	Mihet-Popa, L.	205
De Oliveira-De Jesus, P. M.	195	Moga, M.	148
Delgado, F.	223, 228	Mohammadi, S.	281
Dumitrascu, G.	236	Mohd, A.	66
Dusonchet, L.	22	Molnar-Matei, F.	148
Ekonomou, L.	17	Morton, D.	66
Favuzza, S.	22	Musuroi, S.	34, 277
Filip, I.	201	Nam, S.	118
Frigura, F.	34, 277	Nicola, D. A.	164, 210
Gandomkar, M.	40	Nicolae, G.	95
Gavrilas, G.	106	Oikonomou, D. S.	17
Gavrilas, M.	106	Ortiz, A.	223, 228
Haidari, Z.	287	Ortjohann, E.	66
Hamada, H.	112	Othman, M. Y.	258, 265, 306
Hamsic, N.	66	Ozdemir, A.	131

Pana, A.	89	Svigir, N.	124
Pasulescu, D.	210	Szeidert, I.	205
Perez, S.	223, 228	Tanaka, K.	101
Perpelea, M.	131	Teja. M, K. R.	292
Pinheiro, W.	252	Teridi, M. A. M.	258, 265
Praveen, A.	292	Tomoroga, M.	201
Prostean, O.	205	Tudosie, A.	160
Razak, J. AB.	271	Tusaliu, D. C.	131
Reddy, P. R.	292	Tusaliu, P.	131
Renedo, C.	223, 228	Vatau, D.	34, 277
Rexhepi, V.	28	Volosencu, C.	172, 201, 205
Sano, Y.	112	Vuc, G.	72
Sanseverino, E. R.	22	Wolter, M.	81
Schmelter, A.	66	Xiu-chen, J.	218, 247
Shadmegaran, M. R.	46	Yahya, M.	258, 265, 299, 306, 271
Sharma, A. K.	154, 181	Yatim, B.	306
Shin, J.	118	Yi, Z.	247
Sinsukthavorn, W.	66	Yokoyama, R.	101, 112
Sopian, K.	258, 265, 271, 299, 306	Yu, W.	118
Sora, P. I.	95	Yusta, J. M.	195
Srivastava, R.	242	Zaharim, A.	258, 265, 271, 299
Stoenescu, E.	131, 137, 160		

