

## Technical Sessions

### Session RES II: Renewable Energy Sources

**Session Chairman:** Dr G M Burt, University of Strathclyde, UK

**Time and Place:** Wednesday 3<sup>rd</sup> September, 11:30 – 13:30, Lecture Theatre D

<b>Alternative Energy Resources and Renewable Energy in Latin America</b> Hammons T J, University of Glasgow, UK	581
<b>State of Art in Worldwide Geothermal Power Generation</b> Hammons T J, University of Glasgow, UK	585
<b>Towards a Community Impact Assessment of Renewable Energy Systems: a case study in the isle of Islay</b> Hain J J, Ault G W, Galloway S J, Gair S, and McDonald J R, University of Strathclyde, UK	589
<b>Risks and Constraints in Renewable Energy Utilization</b> El-Shirbeeny E H T, National Water Research Center, Egypt	593
<b>Energy Saving Display Using Light Emitting Polymers</b> Hajto J, Firth A, Hindle C, and He Z, Napier University, Scotland UK	597
<b>Novel Railway Signal Display Using Fluorescent Dye Doped Polymers</b> Firth A, Hajto J, He Z, and Gupta N, Napier University, Scotland UK	601
<b>Power Harvesting for Wearable Electronics</b> Carrol D, and Duffy M, National University of Ireland, Ireland	605



# 38th International Universities Power Engineering Conference UPEC 2003

1 - 3 September 2003, Thessaloniki, Greece

## CONFERENCE PROGRAMME

Organised by

**High Voltage Laboratory**  
Faculty of Electrical and Computer Engineering  
School of Engineering  
Aristotle University of Thessaloniki, Greece

**Session PSP II: Power System Protection**

**Session Chairman:** Dr R Turri, University of Padova, Italy

**Time and Place:** Wednesday 3<sup>rd</sup> September, 11:30 – 13:30, Lecture Theatre B

<b>A Study on Line Protection Device Integrative Coordination System</b> Yinhong L, Xianzhong D, Huazhong University of Science and Technology, China	701
<b>Electrical Protection for a More Electric Engine within the Power Optimised Aircraft</b> Purdie J, Booth C, and McDonald J R, University of Strathclyde, UK	705
<b>Computing Method of the Equivalent Resistivity of Non-Uniform Soil for the Design of Transmission Substation Grounding Grids</b> Aravanis J, Tzouveleakis E, Chronopoulos C, and Antoniou T, Public Power Corporation SA, Greece	709
<b>Exact and Approximated Methods for Earthing Systems in Multi-Layer Soil (Three Layers)</b> Gouda O E, Cairo University, Egypt Thabet M A, High Institute of Energy, Egypt Amer G M, Benha High Institute of Technology, Egypt	713
<b>Frequency Response of Earthing Systems</b> Griffiths H, Zedan B, and Haddad A, Cardiff University, UK	717
<b>Impulse Response of Transmission Tower Earthing System</b> Harid N, Griffiths H, Haddad A, Cardiff University, UK Walker K, National Grid, UK	721
<b>Switching Overvoltage Reduction by Multiple Resistor and Phase-Controlled Circuit Breakers</b> Ametani A, Inoue N, Mori N, and Nagaoka N, Doshisha University, Japan	725
<b>The Study of High Voltage Shunt Reactor Protection of Series Compensated Line</b> Hu Y F, Yin X G, Chen D S, and Zhang Z, Huazhong University of Science and Technology, China	731



## Technical Sessions

### Session RES I: Renewable Energy Sources

**Session Chairman:** Dr T J Hammons, University of Glasgow, UK

**Time and Place:** Wednesday 3<sup>rd</sup> September, 09:00 – 11:00, Lecture Theatre D

#### Standard for the Quantification of CO2 Emission Credits

Hammons T J, University of Glasgow, UK

McConnach J S, Castle Hill Engineering Services, Canada

553

#### Design and Testing of a Pollution Free Hybrid Fuel Cell-Battery Vehicle

Teo A L J, The Robert Gordon University, UK

McGrath D J, Aklil-D'Halluin D D, Angelis Y, siGEN Ltd, UK

557

#### Geographical Information System (GIS) Techniques Applied to Network Integration of Marine Energy

Graham S B, Wallace A R, University of Edinburgh, Scotland UK

Connor G, Scottish Energy Environment Foundation, Scotland UK

565

#### Application of GPS to Current Interrupter Used for Cathodic Protection Survey

Valette S, North East Corrosion Engineers, UK

Salman S K, The Robert Gordon University, UK

Munro D, North East Corrosion Engineers, UK

569

#### Impact of Inverter Size on PV System Energy Production and Cost

Ramachandran J, Pearsall N M, and Putrus G A, Nortumbria University, UK

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#### Comparison between Batteries and Fuel Cells and Environmental Evaluation of PV-Fuel Cell Hybrid Power Plant

Kalantar M, and Sedighzadeh M, Iran University of Science and Technology, Iran

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<b>38 th</b>	<b>International Universities Power Engineering Conference (UPEC 2003)</b>
	<b>High Voltage Laboratory</b> Faculty of Electrical and Computer Engineering School of Engineering Aristotle University of Thessaloniki, Greece 1 - 3 September 2003, Thessaloniki
<b>Organised by</b>	

### Welcome Address

Dear friends and colleagues,

I am very glad and proud to welcome in Thessaloniki, the capital of Macedonia, all the participants and guests of the 38<sup>th</sup> International Universities Power Engineering Conference. This conference was organised this year by the High Voltage Laboratory of the Department of Electrical Energy of the Faculty of Electrical and Computer Engineering of the School of Engineering of the Aristotle University of Thessaloniki.

The International Universities Power Engineering Conference or UPEC as it is more commonly known, with a history of 38 years, has provided and hopefully still provides engineers and Academia an opportunity to find and explore the newest trends in the development of Power Engineering and the scientific methodology that is connected with it.

After a review carried out by the International Steering Committee and the Local Organising Committee, 185 papers reflecting the effort and knowledge of engineers and allied scientists from 32 countries will be published in the Proceedings. All these papers after being judged for their affinity to the subject of the conference in abstract form were then reviewed in full form by a committee of competent scientists. Further the papers will be presented by their authors and discussed in the oral sessions.

As is the custom of all the UPEC, or at least the ones I have attended, besides being scientific events helping engineers and allied scientists to get acquainted with the state of the art in Power Engineering have also a considerable social dimension not only in allowing personal contact and discussions with colleagues from various countries but also in helping them to know a few things about the country that hosts the conference. For this reason the following social events will take place.

Two receptions will take place and a guided tour of the city of Thessaloniki, a city with a 2300 year long history and a very rich collection of monuments form a very big array of cultures like Late Classical, Hellenistic, Roman, Byzantine, Post-Byzantine, Islamic and Modern. Also for those interested and after the end of the conference, two excursions were organised, the first at the Macedonian Royal tombs at Vergina, where the tomb of King Philip father of Alexander the Great can be visited with all its gold and treasures. That tomb was found intact and was excavated by the late Professor Andronikos of this University. The second will be a one day cruise around the Mt. Athos peninsula, a self governing monastic republic, where the beauty of many medieval monasteries amidst a most beautiful and unspoiled nature can be contemplated.

On behalf of the Local Organising Committee I wish to express our thanks to the members of the International Steering Committee and to the session Chairmen. Also to the Rector and Council of the University, the Dean and Council of the School of Engineering, to the President and General Assembly of the Faculty of Electrical and Computer Engineering, to the Director and General Assembly of the Department of Electrical Energy, to the President and governing committee of the "Technical Chamber of Greece", to the Public Power Corporation S.A., to CRES, the IEEE and the IEE.

I also wish to present my personal thanks to the members of the Local Organizing Committee, to the staff of the "Syntonos" agency and especially to Ass. Professor P. N. Mikropoulos and the Staff of the High Voltage Laboratory without whose selfless dedication this conference would not have been able to take place.

Finally let me conclude by thanking all the participants and wishing them all a very fruitful and pleasant conference and stay in Thessaloniki.

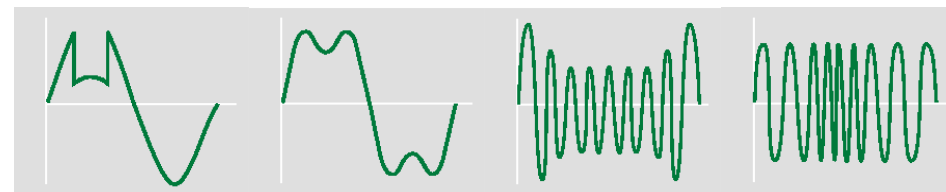
Professor C A Stassinopoulos  
Conference Chairman

**Session PSH:** Power System Harmonics

**Session Chairman:** Dr H Schau, Ilmenau Technical University, Germany

**Time and Place:** Wednesday 3<sup>rd</sup> September, 09:00 – 11:00, Lecture Theatre C

<b>A Case Study on Harmonic Source Caused Transformer Failure on 3-phase 4-wire Distribution System</b>	<b>253</b>
Chen Y L, Ming-Chi Institute of Technology, Taiwan Shen K Y, Liao W B, Kuang Wu Institute of Technology, Taiwan Yang Y R, Ming-Chi Institute of Technology, Taiwan	
<b>A Converter Based Approach to Protection of Shunt Capacitors against Harmonic Currents in Power Distribution Systems</b>	<b>257</b>
Jamali S, and Mousavi S A, Iran University of Science and Technology, Iran	
<b>Attenuation of Harmonics Generated by the Static Inverters</b>	<b>261</b>
Adli M, Ziane-Khodja A, and Mebarek N, Université de Bejaia, Algérie	
<b>Harmonics in Spinning Mills: Causes, Effects and Solutions</b>	<b>265</b>
Dimoulias Ch, Aristotle University of Thessaloniki, Greece	
<b>Harmonics of HVDC Systems under Different Loading Conditions</b>	<b>269</b>
Tofighi A, Jalilian A, and Shoulaie A, Iran University of Science and Technology, Iran	
<b>Modular Single Phase Active Power Filters</b>	<b>273</b>
Roch M, Dobrucky B, University of Zilina, Slovakia Hosny W M, University of East London, UK	
<b>Simulation of the Harmonic Propagation in Electrical Distribution System</b>	<b>277</b>
Azouaou R, Bessai H, Rabahallah S, Leulmi S, and Ghezaili M, University of Tizi-Ouzou, Algeria	
<b>Special Aspects of Flicker Dissipation and Compensation in MV and HV Power Supply Systems</b>	<b>281</b>
Schau H, and Novitskiy A, Ilmenau Technical University, Germany	
<b>Suppression of Voltage Flicker Using Series Capacitors</b>	<b>285</b>
Mosallanejad A, Jalilian A, Shouaie A, Iran University of Science and Technology, Iran	



## Technical Sessions

### Session PSP I: Power System Protection

**Session Chairman:** Prof O E Gouda, Cairo University, Egypt

**Time and Place:** Wednesday 3<sup>rd</sup> September, 09:00 – 11:00, Lecture Theatre B

**The Research of the Overcurrent Relay Based on Phase-to-Phase Differential Current: Adaptive Setting and Coordination** 669  
Yanxia C, Xianggen Y, Zhe Z, and Deshu C, Huazhong University of Science and Technology, China

**A New PMUs Based Relay for Series Compensated Transmission Lines** 673  
Yu C S, National Defense University, Taiwan  
Liu C W, Jiang J A, National Taiwan University, Taiwan

**ANN Based Novel Fault Detector for Busbar Protection** 677  
Moravej Z, Moshanir Co., Iran

**Fault Location Based on Symmetrical Components** 681  
Abouelenin F M, Alexandria University, Egypt

**Fault Type Classification in Power Distribution Feeders Utilizing Statistical Functions and Neural Networks** 685  
Abdel-Latif A N, Egyptian Electricity Transmission Company-Canal Zone, Egypt  
Abdel-Gawad A F, Ishak A A, Mandour M E, Zagazig University, Egypt

**Indices for Relay Protection Quality in Distribution Network** 689  
Bekut D, Djuric D, and Beric I, University of Novi Sad, Yugoslavia

**Optimization Procedure for Time Setting/Coordination of Relays** 693  
Bekut D, Djuric D, and Beric I, University of Novi Sad, Yugoslavia

**Effect of TCPST on Distance Relay Tripping Characteristic** 697  
Jamali S, and Shateri H, Iran University of Science and Technology, Iran



## 38th International Universities Power Engineering Conference 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> September 2003 Aristotle University of Thessaloniki, Greece

### Steering Committee

Prof. C A Stassinopoulos - Chairman	Aristotle University of Thessaloniki, Greece
Prof. M Al-Tai	University of Stafford, UK
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Prof. I A Stathopoulos	National Technical University, Athens, Greece
Dr. B Fox	The Queens University of Belfast, UK
Dr. N K Gupta	Napier University, UK
Dr. A Haddad	University of Wales, Cardiff, UK
Dr. Th J Hammons	University of Glasgow, UK
Dr. P A Howson	University of Brighton, UK
Dr. M S Khanniche	University of Wales, Swansea, UK
Dr. P W Lefley	University of Leicester, UK
Dr. M Müller	University of Durham, UK
Dr. H Nouri	University of the West of England, UK
Dr. R Perryman	University of East London, UK
Dr. G A Putrus	University of Northumbria at Newcastle, UK
Dr. H Schau	Technical University of Ilmenau, Germany
Dr. H Wang	University of Bath, UK
Dr. Zh Wang	UMIST, UK
Mr. N Barry	Cork Regional Technical College, Ireland
Mr. J H Evans	Leoni Wire Cable Wiring Systems, UK
Mr. D Pinches	ALSTOM, Transmission Switchgear, UK

### Local Organising Committee

Prof. C A Stassinopoulos - Chairman	Aristotle University of Thessaloniki, Greece
Prof. A Bakirtzis	Aristotle University of Thessaloniki, Greece
Prof. Th Papazoglou	Technological Educational Institute of Crete, Greece
Prof. I A Stathopoulos	National Technical University, Athens, Greece
Assoc. Prof. D Agoris	University of Patras, Greece
Assoc. Prof. M Danikas	Democritus University of Thrace, Greece
Ass. Prof. P N Mikropoulos	Aristotle University of Thessaloniki, Greece
Mr. P Mavroeidis	Aristotle University of Thessaloniki, Greece
Ms. V Sarigiannidou	Aristotle University of Thessaloniki, Greece
Mr. C G Yakinthos	Aristotle University of Thessaloniki, Greece

## Sponsors

The organizers are grateful to the following organizations for sponsoring UPEC 2003:

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 Faculty of Electrical and Computer Engineering  
 Institution of Electrical Engineers (IEE)  
 Institution of Electrical and Electronic Engineers (IEEE)  
 Technical Chamber of Greece (TCG)  
 Public Power Corporation SA (PPC), Greece  
 Centre for Renewable Energy Sources, Greece

## UPEC 2003

The 38th International Universities Power Engineering Conference will be held at Aristotle University of Thessaloniki on the 1st, 2nd and 3rd September 2003. The conference will be organised by the High Voltage Laboratory of the Department of Electrical Energy of the Faculty of Electrical and Computer Engineering of the School of Engineering of the Aristotle University of Thessaloniki.

The conference provides engineers and academia with the opportunity to explore recent developments, current practices and future trends in power engineering. Young engineers and research students are especially invited to contribute.

## Papers

One hundred and eighty three papers have been included in the conference proceedings. They have been consolidated into one volume. The papers represent contributions from the following 32 countries:

Algeria	Germany	Jordan	Slovakia
Australia	Greece	Kuwait	Taiwan
Belgium	Iceland	Libya	Thailand
Canada	India	Malaysia	The Netherlands
China	Iran	Pakistan	Turkey
Egypt	Ireland	Poland	United Arab Emirates
Finland	Italy	Portugal	United Kingdom
France	Japan	Romania	Yugoslavia

## Oral Sessions

All UPEC 2003 papers will be presented orally in sessions of two hours in length. The Chairman of each session will allow 10 minutes per presentation followed by 5 minutes of questions. Please be present in the Lecture Theatre 15 minutes before the session starts in order to meet the Chairman and familiarize yourself with the facilities available for your presentations.

## Session HVE II & LP: High Voltage Engineering and Lightning Protection

**Session Chairman:** Assoc Prof M Danikas, Democritus University of Thrace, Greece

**Time and Place:** Tuesday 2<sup>nd</sup> September, 11:30 – 13:30, Lecture Theatre D

<b>Eliminating White Noises from Acoustic Discharge Signals Using Adaptive Filter Techniques</b> Ramli A Q, and Wang Z D, UMIST, UK	<b>89</b>
<b>Effect of Oil Flow on Partial Discharges in Power Transformers</b> Sofian D M, and Wang Z D, UMIST, UK	<b>93</b>
<b>The Effects of Temperature on Partial Discharges in Transformer Insulation</b> Jimoh K A, and Wang Z D, UMIST, UK	<b>97</b>
<b>Selection of the Optimal Insulator Type for a New HV Overhead Transmission Line, Using the Method of the Multicriterial Decision Making</b> Fotis, G P, Kontargyri V T, Gonos I F, and Stathopoulos I A, National Technical University of Athens, Greece	<b>101</b>
<b>Insulation Co-ordination of Compact Substations</b> Ullah N, Haddad A, German D M, Cardiff University, UK Tong YK, Tyco Electronics, UK	<b>105</b>
<b>An Improved Backflashover Model for Estimating the Lightning Performance of Transmission Lines</b> Ekonomou L, Gonos I F, Stathopoulos I A, National Technical University of Athens, Greece	<b>109</b>
<b>Insulation Flashover-Voltage Probability Distribution Influence to the Overhead Line Lightning Performance Estimation</b> Savic M, University of Belgrade, Yugoslavia Skuletic S, Muratovic D, University of Montenegro, Yugoslavia	<b>113</b>
<b>Transient Analysis of a Buried Horizontal Conductor by an FDTD Method</b> Baba Y, Nayel M, Doshisha University, Japan Sekioda S, Kansai Tech Corporation, Japan Nagaoka N, Ametani A, Doshisha University, Japan	<b>117</b>



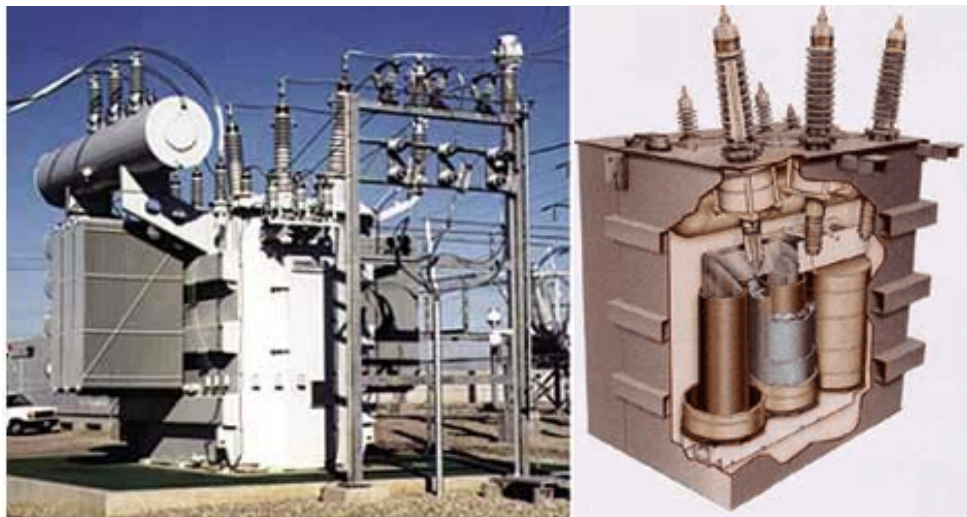
## Technical Sessions

**Session PT:** Power Transformers

**Session Chairman:** Dr M A Redfern, University of Bath, UK

**Time and Place:** Tuesday 2<sup>nd</sup> September, 11:30 – 13:30, Lecture Theatre C

- A Comparison of Methods to Determine the Reactance of a Power Transformer Using Analytical Techniques and Finite Element Analysis** 529  
Pinches D S, ALSTOM T&D LTD, UK  
Al-Tai M A, Tennakoon S B, Staffordshire University, UK
- A Transformer Protection Using Virtual 3rd Harmonic and Sampled Value Differential Techniques** 533  
Yang J C, Yin X G, Chen D S, Zhang Z, and Wang Z H, Huazhong University of Science and Technology, China
- Application of Information Fusion Technology in Power Transformer Monitoring and Fault Diagnose** 537  
Wenping H, Xianggen Y, Zhe Z, and Deshu C, Huazhong University of Science and Technology, China
- Improvement in the Performance of Series Connected on Load Tap Changer Transformers Using Local Measurements to Determine Upstream Tap Changer Control Actions** 541  
Smith C A, and Redfern M A, University of Bath, UK
- Application of Lagrange Method in Optimal Design of Toroidal Transformers** 545  
Jalebi E A, University of Cambridge, UK  
Oraee H, Sharif University of Technology, Iran
- Simple Equivalent Circuit of Air-Core Coil for Transient Simulation** 549  
Mizuno S, Nagaoka N, Tanigaki K, and Ametani A, Doshisha University, Japan



## Prizes

Two prizes will be awarded for the best papers, one for the best oral presentation by a student under the age of 30 and one for the best paper.

## Language

The working language will be English. No translation service will be available

## Civic Reception

The Conference Reception will be held on the evening of Monday 1<sup>st</sup> September 2003 at "Villa Bianca" that has been gracefully provided by the Municipality of Thessaloniki. Coaches will depart at 20.30 pm.

## Cultural Visit

A guided tour of the city of Thessaloniki will take place, a city with a 2300 year long history and a very rich collection of monuments form a very big array of cultures like Late Classical, Hellenistic, Roman, Byzantine, Post-Byzantine, Islamic and Modern.

## Banquet

The Banquet will be held on the evening of Tuesday 2<sup>nd</sup> September 2003 at the gardens of the Prefecture of Thessaloniki. Coaches will depart at 20.30 pm.

## Refreshments and Lunches

Refreshments will be provided and Lunches will be served in the entrance Hall of the Main Building.

## Conference Address

High Voltage Laboratory  
Department of Electrical Energy  
Faculty of Electrical and Computer Engineering  
School of Engineering  
Aristotle University of Thessaloniki  
Thessaloniki GR-54124  
Tel./ Fax: +30 2310 996389  
e-mail: [upec03@eng.auth.gr](mailto:upec03@eng.auth.gr)

## Registration

The Conference registration desk will be open at the following times:

Sunday 31 <sup>st</sup> August	5.30pm – 9.00pm
Monday 1 <sup>st</sup> September	9.00am – 2.00pm
Tuesday 2 <sup>nd</sup> September	9.00am – 2.00pm
Wednesday 3 <sup>rd</sup> September	9.00am – 2.00pm

## Program Overview

Time	Sunday 31 August	Monday 1st September	Tuesday 2nd September	Wednesday 3rd September
9.00-10.00		Registration	Sessions 4: 4a. PSOC IV	Sessions 6: 6b. PSP I
10.00-11.00		Opening Ceremony & Keynote Address	4b. TDS I 4c. PEE 4d. HVE I	6c. PSH 6d. RES I
11.00-11.30		Refreshments	Refreshments	Refreshments
11.30-13.30		Sessions 1: 1a. PSOC I 1b. PSSA I 1c. PE I 1d. PG	Sessions 5: 5a. PSOC V 5b. TDS II 5c. PT 5d. HVE II & LP	Sessions 7: 7b. PSP II 7d. RES II
13.30-15.00		Lunch	Lunch	Lunch
15.00-15.30		Sessions 2: 2a. PSOC II 2b. PSSA II	Free Evening City tour	Closing Ceremony & Prizes
15.30-17.00		2c. PE II 2d. EMD I		
17.00-17.30		Refreshments		
17.30-19.30	Registration	Sessions 3: 3a. PSOC III 3b. PSSA III 3d. EMD II		
19.30-21.00		Steering Committee Meeting		
21.00-		Conference Reception	Banquet	

Opening Ceremony & Keynote Address: Lecture Theatre A

Closing Ceremony & Prizes: Lecture Theatre A

Sessions a: Lecture Theatre A

Sessions b: Lecture Theatre B

Sessions c: Lecture Theatre C

Sessions d: Lecture Theatre D

### Session TDS II: Transmission and Distribution Systems

**Session Chairman:** Prof E B Hreinsson, University of Iceland, Iceland

**Time and Place:** Tuesday 2<sup>nd</sup> September, 11:30 – 13:30, Lecture Theatre B

#### Improving Transient Stability of AC system with HVDC Light

Zhaoqing H, Chengxiong M, Jiming L, Weibo L, and Wang D, Huazhong University of Science and Technology, China

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#### Interaction between 2x25 kV - 50 Hz Traction System and Three-phase Power Supply Network

Caramia P, Verde P, University of Cassino, Italy  
Battistelli L, Carpinelli G, Proto D, University of Napoli "Federico II", Italy

645

#### Limitations and Utilisation of a Distribution Network with Dispersed Generators:

##### A Practical Case Study

Liu C H, Myrzik J M A, Cobben J F G, and Kling W L, Technical University of Eindhoven, The Netherlands

649

#### Pricing for Wheeling Charge Based on Determination of Transmission Path

Li R, Tokyo Metropolitan University, Japan  
Chen L, Osaka Sangyo University, Japan  
Magori H, Tokyo Electric Power Services Co. Ltd, Japan  
Yokoyama R, Tokyo Metropolitan University, Japan

653

#### Stochastic Determination of Power Cables Ratings in Electrical Distribution Generation Systems

Hegazy Y G, Chikhani A Y, University of Waterloo, Canada

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#### Voltage Sag Characteristics of Covered Conductor Feeders

Heine P, Helsinki University of Technology, Finland  
Pitkänen J, Pirelli Cables and Systems Oy, Finland  
Lehtonen M, Helsinki University of Technology, Finland

661

#### Geographic Information System for the Digitization and Management of Electrical Networks

Psalidas M S, Agoris D, Pyrgioti E, University of Patras, Greece  
Kilias V, Stratis P, Tigas K, Centre for Renewable Energy Sources, Greece

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## Technical Sessions

### Session PSOC V: Power System Operation and Control

**Session Chairman:** Dr G A Putrus, Nortumbria University, UK

**Time and Place:** Tuesday 2<sup>nd</sup> September, 11:30 – 13:30, Lecture Theatre A

#### Independent Power Producers Parameters Estimation

Sterpu S, Bésanger Y, and HadjSaid N, Laboratoire d' Electrotechnique de Grenoble, France

#### Power Systems State Estimation - An Overview

Brandão R F M, Carvalho J A B, Instituto Superior de Engenharia do Porto, Portugal  
Ferreira I M, Faculdade de Engenharia da Universidade do Porto, Portugal

#### A PLC Based Energy Consumption Management System: Preliminary Field Tests and Simulation Results

Tsiamitros D, Lettas N, Papagiannis G, and Tampakis D, Aristotle University of Thessaloniki, Greece

#### A S.AR.I.MA Short Term Load Forecasting Model for the Autonomous Electric Power System of Crete

Britzolakis G S, and Papazoglou Th, Technological Educational Institute of Crete, Greece

#### Power Distribution Load Forecasting Using Artificial Neural Networks

Eminoglu U, Yalcinoz T, and Herdem S, Nigde University, Turkey

#### The Approximation and Re-sampling of Current and Voltage's Sampling Data in Power Systems

Xu H, Nanjing Institute of Industry Technology, China  
Wang H F, University of Bath, UK

#### Distribution Automation by IED-s

Watson I, Willis N, and Al-Tai M A, Staffordshire University, UK



## Technical Sessions

### Session PSOC I: Power System Operation and Control

**Session Chairman:** Prof C Y Cao, Zhejiang University, China

**Time and Place:** Monday 1<sup>st</sup> September, 11:30 – 13:30, Lecture Theatre A

#### A Multi Agent System for Power System Supervisory Control

Isnadar S and Ozveren C S, University of Abertay Dundee, Scotland UK

#### A New Algorithm for Monitoring Low Frequency Oscillation in Real Time

Yang J Z, Liu C W, National Taiwan University, Taiwan  
Wu W G, ADX Scientific Co Ltd, Taiwan

#### An Adaptive Control Strategy for Parallel and Isolated Operation of Dispersed Generators

Sishuba S and Redfern M A, University of Bath, UK

#### Automatic Control Method Considering Decreasing Output of LFC and Time Difference Compensation

Kondou Y, Mizutani Y, Aoki H, Tokai University, Japan  
Goto Y, Yukita K, Aichi Institute of Technology, Japan

#### Design of Integrated Database for Distribution Management System

Popović D S, University of Novi Sad, Yugoslavia  
Memarovic R, Power Industry of Serbia, Yugoslavia

#### Development of Computer-Based Cost Effective Monitoring for Substations

Yu F, and Gupta N K, Napier University, Scotland UK

#### Power System Control Applications Based on Artificial Immune Systems

Ali G, Wang H F, and Aggarwal R, University of Bath, UK

#### The Design of a Support System for the Management of Flexible Power Distribution Networks

Korbik A, Burt G M, McArthur S D J, and McDonald J R, University of Strathclyde, UK



## Technical Sessions

### Session PSSA I: Power System Simulation and Analysis

**Session Chairman:** Dr G Papagiannis, Aristotle University of Thessaloniki, Greece

**Time and Place:** Monday 1<sup>st</sup> September, 11:30 – 13:30, Lecture Theatre B

#### Advanced Techniques in Evolutionary Algorithms with Applications to Power Systems 433

Cao Y J, Jiang Q Y, Zhejiang University, China  
Fu J S, Huazhong University of Science and Technology, China

#### Development of High Speed Genetic Algorithm Based on Search-less Space Elite Optimization Type 437

Leelajindakraierk M, King Mongkut' s Institute of Technology Ladkrabang, Thailand  
Mizutani Y, Ishikawa T, Kondou Y, Tokai University, Japan  
Okabe T, Electric Power Development Co. Ltd, Japan  
Hatano S, Hagihira M, Kaihatsu Computing Service Center Ltd, Japan

#### Multi-Objective Genetic Algorithms for Optimal Reactive Power Compensation on the IEEE 30-Bus System 441

Li F, and Dabeedin C, University of Bath, UK

#### An Application of Tabu Search to Economic Dispatch Problem 445

Yavuzer T, and Yalcinoz T, Nigde University, Turkey

#### Fuel Cost Characteristics of CCP and Simple Cycle Multiple Fuel Units 449

Farooq Aslam M, University of Engineering & Technology Lahore, Pakistan  
Lidgate D, Napier University, Scotland UK  
Aslam Shami T, University of Engineering & Technology Lahore, Pakistan

#### Some Initial Studies Relating to a GA based Dispatch Optimization of Renewable Energy 453

Bhandari N M, Galloway S J, Burt G M, and McDonald J R, University of Strathclyde, UK

#### Voltage and Reactive Power Control by GA Considering System Decomposition 457

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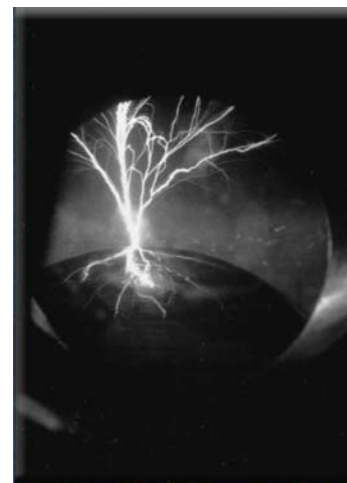
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### Session PEE: Power Engineering Education

**Session Chairman:** Assoc Prof Safigianni A S, Democritus University of Thrace, Greece

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**Session Chairman:** Assoc Prof P Verde, University of Cassino, Italy

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## Technical Sessions

### Session PSOC IV: Power System Operation and Control

**Session Chairman:** Dr T Yalcinoz, Nigde University, Turkey

**Time and Place:** Tuesday 2<sup>nd</sup> September, 09:00 – 11:00, Lecture Theatre A

#### Generation Dispatch Strategy for Transmission Congestion Management in Deregulated Power Systems

Sugimoto J, Yokoyama R, Tokyo Metropolitan University, Japan  
Nioka S, Mitsubishi Research Institute Inc., Japan  
Niimura T, University of British Columbia, Canada

#### A New Clustering Method for Network Partitioning for Zonal Pricing

Yang H, Huazhong University of Science and Technology, China  
Duan X, Changsha University of Electric Power, China

#### Decentralized Congestion Management of Interconnected Power Systems

Biskas P N, and Bakirtzis A G, Aristotle University of Thessaloniki, Greece

#### Impact of Congestion Management on Energy Schedules and Costs

Manzo V, Manescu L G, and HadjSaid N, INPG, France

#### Steady-State Contingency Classification Using the Rough Set Theory

Faustino Agreira C I, Machado Ferreira C M, Dias Pinto J A,  
Instituto Superior de Engenharia de Coimbra, Portugal  
Maciel Barbosa F P, Faculdade de Engenharia da Universidade de Porto, Portugal

#### Web Services Platform for Power System Development Planning

McMorran A W, Ault G W, Foote C E T, Burt G M, and McDonald J R, University of Strathclyde, UK



### Session PSOC II: Power System Operation and Control

**Session Chairman:** Prof Q H Wu, The University of Liverpool, UK

**Time and Place:** Monday 1<sup>st</sup> September, 15:00 – 17:00, Lecture Theatre A

#### Dynamic Breaking Strategy for Transient Stability Improvement of Power Systems

Saied E M, Zagazig University, Egypt

#### Multimachine Power System Stability Improvement for Coordinated Multiple Pole Shifting Technique

Shabib G, Aswan High Institute of Energy, Egypt

#### Optimal Coordinated Generator Excitation and SMEs Control for Transient Stability Improvement of Power System

Shu F, Chengxiong M, Jiming L, Weibo L, Huazhong University of Science and Technology, China  
Luonan C, Osaka Sangyo University, Japan

#### Stabilizing Control for Mitigating Inter-area Mode Making Use of PSSs in Multi-Regional Power System

Liu C, Yokoyama R, Tokyo Metropolitan University, Japan  
Ishimaru M, Koyanagi K, TEPCO Systems Corporation, Japan

#### Study on Adaptive Power System Stabilizing Control

Ishikawa T, Mizutani Y, Tokai University, Japan  
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Okabe T, Electric Power Development Co. Ltd, Japan  
Hagihira M, Kaihatsu Computing Service Center Ltd, Japan

#### An extended Method to Compute the Unstable Equilibrium Points in Power Systems

Jiang Q Y, Cao Y J, Zhejiang University, China  
Zhang H X, Huazhong University of Science and Technology, China

#### Analysis of the Generators Tripping in the Transient Stability of an Electrical Power Network Using a Hybrid Method

Machado Ferreira C M, Dias Pinto J A, Instituto Superior de Engenharia de Coimbra, Portugal  
Maciel Barbosa F P, Faculdade de Engenharia da Universidade do Porto, Portugal

#### Development of Effective Coherency-based Models for Stability Studies

Al-Isawi S J, The High Institute for Industry, Libya



## Technical Sessions

### Session PSSA II: Power System Simulation and Analysis

**Session Chairman:** Prof J A Dias Pinto, Instituto Superior de Engenharia de Coimbra, Portugal

**Time and Place:** Monday 1st September, 15:00 – 17:00, Lecture Theatre B

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### Session EMD II: Electrical Machines and Drives

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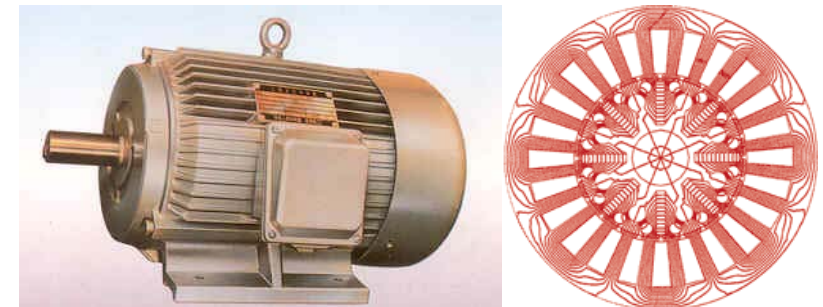
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## Technical Sessions

### Session PSSA III: Power System Simulation and Analysis

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**Time and Place:** Monday 1st September, 17:30 – 19:30, Lecture Theatre B

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### Session PE II: Power Electronics

**Session Chairman:** Dr N K Gupta, Napier University, UK

**Time and Place:** Monday 1st September, 15:00 – 17:00, Lecture Theatre C

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## Technical Sessions

### Session EMD I: Electrical Machines and Drives

**Session Chairman:** Dr M S Khanniche, University of Wales, Swansea, UK

**Time and Place:** Monday 1st September, 15:00 – 17:00, Lecture Theatre D

**A Neural Network Based Speed Estimator for Induction Motor Scalar Drive**

Soliman A H, and Hallouda M M, Cairo University, Egypt

**Calculation of Rail Potentials in a DC Electrified Railway System**

Çolak K, and Hocaoglu M H, Gebze Institute of Technology, Turkey

**Comparison of Different Drives in Servo Systems**

Oraee H, Arefi A, Valley P, Sharif University of Technology, Iran

Jalebi E A, University of Cambridge, UK

**Design and Fuzzy Control of a High Performance Electro-Mechanical Gearbox Actuator**

Iordanidis G, Holliday D, Mellor P, and Churn P, University of Bristol, UK

**Experimental Determination of Induction Motor's Stator Vibrational Shapes for Acoustic Power Level Calculation**

Karkoniski D R, Moson I, and Wolejko M, Gdansk University of Technology, Poland

**Linear and Non-Linear Analysis of a Realistic Power System with Strong Wind Penetration**

Nomikos B M, Potamianakis E G, and Vournas C D, National Technical University of Athens, Greece

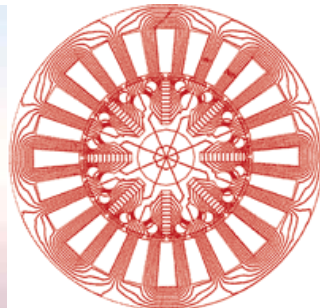
**Malfunctions of Diesel-Electro Generators Used in Marine Engineering**

Gourgoulis D E, Vouvalidis X A, Schinas C A, and Yakinthos C G, Merchant Marine Academy of Makedonia, Greece

**Offset Pole Face Winding - An Experimental Investigation**

Hanitsch R, Technische Universität Berlin, Germany

Sels T, Katholieke Universiteit Leuven, Belgium



### Session PSOC III: Power System Operation and Control

**Session Chairman:**

**Time and Place:** Monday 1st September, 17:30 – 19:30, Lecture Theatre A

**Application of a Multi-Level Inverter Based Static Synchronous Series Compensator on a typical IEEE Benchmark for Power Systems Oscillation Studies**

Eveleigh D, Nouri H, and Davies T, University of the West England, UK

**Contribution of FACTS Systems in the Field of the Attenuation of the Electric Disturbances**

Ziane-Khodja A, Université de Bejaia, Algérie

Bacha S, INPG – Grenoble, France

Adli M, Université de Bejaia, Algérie

**Enhancement of Power System Operations by Using Multiple Variable Structure Power Flow Controllers (VSPFCS) on Evolutionary Programming**

Ma T T, National United University, Taiwan

**Fuzzy Logic to Improve Multifunctional FACTS Controller Performance**

Menniti D, Pinnarelli A and Sorrentino N, University of Calabria, Italy

**Interactions and Co-ordination of FACTS Control**

Wang H F, University of Bath, UK

Xu H, Nanjing Institute of Industry Technology, China

**On the Effect of SVC Control Design on Dumping of Low Frequency Oscillations**

Banejad M, and Ledwich G, Queensland University of Technology, Australia

**Analysis of FACTS Devices for Dynamic Loads Using MATLAB**

Eminoglu U, Yalcinoz T and Herdem S, Nigde University, Turkey

**Selective Load Shedding in the Dynamic Voltage Stability Assessment of an Electric Power System**

Monteneiro Pereira R M, Machado Ferreira C M, Dias Pinto J A,

Instituto Superior de Engenharia de Coimbra, Portugal

Maciel Barbosa F P, Faculdade de Engenharia da Universidade do Porto, Portugal

