

INTELEC 2010 – Preliminary Technical Program (5/19/10)

TECHNICAL PROGRAM

SESSION 1: USE OF HIGH VOLTAGE DC I

Session Chair: Dusty Becker

Application of high voltage DC in the real world

1:00 pm - 1:30 pm

1.1 Power Quality Disturbances Within DC Data Centers

S Rajagopalan; B Fortenbery; D Symanski, *Electric Power Research Institute*

1:30 pm - 2:00 pm

1.2 Higher-Voltage Direct Current Voltage Study, ICT Equipment Perspective

H Yamamura, *Enterprise Server Division, Hitachi, Ltd*; K Umezawa, *Server and Workstation Operation Unit, NEC Corporation*; S Takahashi, *Enterprise Server Unit, Fujitsu Limited*

2:00 pm - 2:30 pm

1.3 What Does a Telco Need for 400 VDC to Find a Place in the Central Office: It's All About Distribution and Conversion

D P Mcmenamin, *Dan McMenamin and Associates, Inc.*

2:30 pm - 3:00 pm

1.4 The Result of Demonstration Experiment of Higher Voltage Direct Current (HVDC) Feeding for ICT Equipment in a Data Center of Tokyo

N Masatoshi; H Keiichi; Y Mikio, *NTT Facilities, Inc.*; O Takahiro; M Hitoshi, *NTT Data Corporation*

SESSION 2: ENERGY STORAGE I

Session Chair: John Gagge

Real world examples of making stored energy work.

1:00 pm - 1:30 pm

2.1 Lessons Learned in the Coordination of Lithium-Ion Battery Charging and Control

J Mcdowall, *Saft America Inc.*; P Fleureau, *Saft SA*

1:30 pm - 2:00 pm

2.2 Design Considerations for a Lithium Ion Energy Storage System

J Anderson; J Frankhouser; D Boyer, *C&D Technologies*

2:00 pm - 2:30 pm

2.3 Passing the 10-Year Mark – a Multi-Year, Multi-Technology Analysis of Ni-Cd Field Data

S Lansburg; R Boulais; A Brenier, *Saft*

2:30 pm - 3:00 pm

2.4 Nickel-Iron Battery -Based Electrochemical Energy Storage Systems for Rural/Remote Area Telecommunication

S A.K., *Indian Institute of Science*; G S.A., *NED Energy Limited*; H B., *Indian Institute of Science*

SESSION 3: POWERING WIRELESS NETWORKS

Session Chair: Murray Macdonald

Power management, distributed architecture and future trends in the wireless world

1:00 pm - 1:30 pm

3.1 A Solution to Dynamically Decrease Power Consumption of Wireless Base Stations and Power Them with Alternative Energies

C Grangeat; F Wauquiez; G Grandamy, *Alcatel-Lucent*

1:30 pm - 2:00 pm

3.2 Energy Management & Backup Unit for Telecom Base Stations

R Malhotra, *Luminous Teleinfra Ltd*

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2:00 pm - 2:30 pm

- 3.3 Distributed Power Plant Architecture in a Shared Infrastructure Network**
G D Prakash; V Subramaniam; P Metharamitta, *Amara Raja Power Systems Ltd*

2:30 pm - 3:00 pm

- 3.4 Wireless LTE Deployment: How It Is Changing Cell Site Energy and Infrastructure Design**
P Misar, *Emerson Network Power*

SESSION 4: USE OF HIGH VOLTAGE DC II

Session Chair: Steve Natalie

Further developments and trends in the high voltage world

4:00 pm - 4:30 pm

- 4.1 Development of Higher Voltage Direct Current Power Supply System**
T Babasaki; T Tanaka; K Asakura; Y Nozaki, *NTT*

4:30 pm - 5:00 pm

- 4.2 400Vdc Power Distribution: Overcoming the Challenges**
D Becker; B Sonnenberg, *Emerson Network Power*

5:00 pm - 5:30 pm

- 4.3 Development of 400-Vdc Output Rectifier for 400-Vdc Power Distribution System in Telecom Sites and Data Centers**
A Matsumoto; M Yamasaki; T Takeda; A Fukui, *NTT Facilities, Inc.*

SESSION 5: CODES AND STANDARDS

Session Chair: George Zguris

What are the standards that apply to you and how can they affect your operation

4:00 pm - 4:30 pm

- 5.1 An Update on the Codes, Standards and Guides Applicable to Stationary Lead-Acid Batteries**
J Byrne; J Byrne, *Interstate PowerCare*

4:30 pm - 5:00 pm

- 5.2 Stationary Lead-Acid Batteries Maintenance Management System**
M N C Rosolem; R F Beck; V T Arioli; P T Frare; G R Santos; L F Dias; P O Lopes; P O Lopes, *CPqD*; G R Pesenti, *Light*

5:00 pm - 5:30 pm

- 5.3 Hydrogen Outgassing, Electrical Consumption and the Myriad Code Requirements: Much Venting Over Ventilation**
D Mcmenamin, *Dan McMenamin and Associates, Inc.*; R Steward, *Verizon Wireless*

PANEL SESSION 1: DISASTER RECOVERY AND GRID SECURITY

8:00 am - 9:30 am

A panel of experts with a focus on real world insight into what can go wrong, has gone wrong and what steps were necessary not only to fix the issue, but prevent its recurrence again.

Curtis Ashton, Qwest
Alexis Kwasinski, University of Texas
Christopher Radley, Alteryx Systems
Charlie Romano, Verizon

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SESSION 6: DC SYSTEM DESIGN

Session Chair: Ernie Farren

Designs and modeling of DC systems with real world focus and applications

8:00 am - 8:30 am

- 6.1 Integrated Life-Cycle Power Asset Management for Telecom Operators**
D St-Arnauld, *Multitel*; D Chabot, *Embrase*

8:30 am - 9:00 am

- 6.2 Secondary Distribution Architecture and Acceptance Testing**
B Bailey, *Emerson Network Power*

9:00 am - 9:30 am

- 6.3 Super Models' in Mission Critical Facilities**
F Bodi, *Silcar Pty Ltd*

SESSION 7: HIGH EFFICIENCY RECTIFIERS

Session Chair: Dusty Becker

A look at rectifier designs and efforts to improve efficiency

10:30 am - 11:00 am

- 7.1 A Three-Phase AC-DC Rectifier with Reduced Switch Count**
D Wijeratne; G Moschopoulos, *University of Western Ontario*

11:00 am - 11:30 am

- 7.2 Design Consideration of High Efficiency High Density Telecom Rectifier**
C Yan; Y Ye; J Ying, *Delta Electronics (Shanghai) Co. Ltd.*; B Blair, *Delta Greentech (USA)*

11:30 am - 12:00 pm

- 7.3 A Self Sustained Oscillation Controlled Three-Level AC-DC Single- Stage Converter**
P Das; G Moschopoulos, *University of Western Ontario*; P Jain, *Queens University*

SESSION 8: ENERGY STORAGE II

Session Chair: George Zguris

What's right and how do you know it is still reliable - Further insight into energy storage for today

10:00 am - 10:30 am

- 8.1 VRLA Battery System Reliability and Proactive Maintenance**
X Liu; W Wang, *CITC*

10:30 am - 11:00 am

- 8.2 Application of Front Terminal VRLA Batteries in Base Stations - A Study by a Global Telecom Operator**
J Gao; L Yu, *China Mobile Communications Group Zhejiang Co., Ltd*

11:00 am - 11:30 am

- 8.3 Ohmic Battery Testing in Indian Telecommunications Networks**
T J Stukenberg, *Midtronics*; T Gopal, *HBL Power Systems Limited*

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11:30 am - 12:00 pm

8.4 Efficient Powering of Communication and IT Equipments Using Rotating UPS

SESSION 9: CRITICAL EVENT PLANNING

Session Chair: Zbig Noworolski

Power supply is a fundamental need during disasters as it is attest by the fact that most communication outages during disasters is caused by power-related incidents. This session explores strategies for power supply resiliency including cost implications, effective resource management, and the potential impact on communication systems of the evolution of the power grid into an advanced "smart" grid.

8:00 am - 8:30 am

9.1 Method for Cost-Benefit Analysis of Emergency Backup Power Systems for ICT Applications

K Hirose, *NTT Facilities, Inc.*; T Matsumura, *Nagoya University*; M Yamasaki, *NTT Facilities, Inc.*

8:30 am - 9:00 am

9.2 Implication of Smart-Grids Development for Communication Systems in Normal Operations and During Disasters

A Kwasinski, *The University of Texas at Austin*

9:00 am - 9:30 am

9.3 Efforts to Improve the Reliability of Telecom Power

H Ikebe; S Iwai; T Tsumura; N Morii; K Hirose, *NTT Facilities, Inc.*

PANEL SESSION 2: EMERGING MARKETS - OVERVIEW AND IMPACT

8:00 am - 9:30 am

A panel of international experts with experience in the emerging markets of the globe. What is happening, what's needed and what can both users and manufacturers expect to see in the years to come.

John Gagge, EnerSys
Rich Garafola, Alcatel-Lucent
Jim McDowall, SAFT
Mickey Oros, Altergy Systems
Thierry Tardivent, Northstar Battery
Roberto Wolfenson, EnerSystem America

SESSION 10: DIGITAL CONTROL OF CONVERTERS

Session Chair: Praveen Jain

Improved converter response

10:00 am - 10:30 am

10.1 Digital Control of Resonant Converters at Ultra High Frequency

D J Tschirhart; P K Jain, *Queen's University*

11:00 am - 11:30 am

10.2 Stability Analysis and Large Signal Behavior of a High Performance Voltage Regulator with Non-Linear Multi-Mode Digital Control

S Pan; P Jain, *Queen's University*

11:30 am - 12:00 pm

10.3 A Fast Transient Responce Technique for DPWM DC-DC Converters

Y Ishizuka; F Hirose; Y Yamada; H Matsuo, *Nagasaki University*

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SESSION 11: FUEL CELL

Session Chair: John Gagge

Advancements in Hydrogen fuel cells, their applications and options for fueling them

10:00 am - 10:30 am

11.1 Fuel Cell Technology: An Emerging Solution for Back-Up Power to Replace or Supplement the Traditional Solutions

R Szasz, *MTS Allstream*; J Lemos, *Hydrogenics*

10:30 am - 11:00 am

11.2 Advanced Fuel Cell Solution for Telecom Networks – Results from Global Field Installations

A Trehan, *Andrew Solutions*

11:00 am - 11:30 am

11.3 Hydrogen Delivery and Storage Options for Backup Power and Off-Grid Primary Power Fuel Cell Systems: Two Years Later

M Cohen, *ReliOn*; K P Kenny, *Sprint*

11:30 am - 12:00 pm

11.4 Advantages of Liquid Fuel Vs. Hydrogen for Backup Power Fuel Cell Systems in Telecom Applications

R Romer, *IdaTech*

SESSION 12: COOLING OF DATACENTERS

Session Chair: Dan McMenamin

New ideas for thermal management in today's datacenters.

10:00 am - 10:30 am

12.1 Thermal Management in Telecommunications Central Offices: The Next Steps

M K Herrlin, *ANCIS Incorporated*; R G Kluge, *Telcordia Technologies*

10:30 am - 11:00 am

12.2 Alcatel-Lucent Modular Cooling Solution

P Hayden; W Scofield, *Alcatel-Lucent*

11:00 am - 11:30 am

12.3 New Thermal Architecture for Future Green Data Centres

S Le Masson; D Nörtershäuser, *France Telecom*

11:30 am - 12:00 pm

12.4 Study on Free Cooling Systems for Data Centers in Japan

Y Udagawa; S Waragai; M Yanagi, *NTT Facilities, Inc.*; W Fukumitsu, *NTT GP-ECO communication, INC.*

SESSION 13: LOSSLESS SWITCHING OF CONVERTERS

Session Chair: Don Davidson

Design considerations for AC and AC converters

1:00 pm - 1:30 pm

13.1 Zero Voltage Switched Full Bridge DC/DC Converter

D Davidson, *Gleneagles Technologies Ltd.*

1:30 pm - 2:00 pm

13.2 A Zero-Voltage Switching Four-Port Integrated DC/DC Converter

Z Qian, *University of Central Florida*; O Abdel-Rahman, *ApECOR*; H Hu; I Batarseh, *University of Central Florida*

2:00 pm - 2:30 pm

13.3 A Predictive Control Strategy for Adaptive Energy Storage in ZVS Phase-Shift-Modulated Full-Bridge Converter Topologies

A Safaee; H Daneshpajoo; D Tschirhart; M Pahlevaninezhad; A Bakhshai; P Jain, *Queen's University*

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2:30 pm - 3:00 pm

13.4 Design Considerations of a High Efficiency ZVS Buck AC-DC Converter with Constant On-Time Control

J Yang; X Wu; J Zhang, *Zhejiang University*; M Xu, *FSP-PowerLand (Nanjing) Technology Inc.*; Z Qian, *Zhejiang University*

SESSION 14: RENEWABLE POWER GENERATION I

Session Chair: Zbig Noworolski

A session on the leading trends and ideas in the renewable markets

1:00 pm - 1:30 pm

14.1 Energy Efficiency and Conservation: A Way Forward for Jamaica

H A Morris, *University of the West Indies*

1:30 pm - 2:00 pm

14.2 Evaluation of Output Performance of Various Photovoltaic Systems in the Hokuto Mega-Solar Project

K Nishioka; T Shimakage; H Yamane; M Kudo, *NTT Facilities, Inc.*; Y Ueda, *Tokyo Institute of Technology*

2:00 pm - 2:30 pm

14.3 A Master-Slave Fuzzy Logic Control Scheme for Maximum Power Point Tracking in Wind Energy Systems

J Hui; A Bakhshai; P Jain, *Queen's University*

2:30 pm - 3:00 pm

14.4 A Hybrid Renewable Energy System for Powering Information and Communication Technology (ICT)

H R Karshenas; M Karimi Ghartemani; D Yazdani; S Khajehoddin; M Zaman; A Bakhshai; P Jain, *Queen's University*

SESSION 15: IMPROVING ENERGY EFFICIENCY

Session Chair: Murray MacDonald

Strategies, models and innovations to lower your carbon footprint

1:30 pm - 2:00 pm

15.1 New Models for BTS Energy Savings Strategies

C Vetromile; A Petraglia; A D'Onofrio, *Department of Environmental Science II Università di Napoli*; L Maria; S Curcuruto; G Marsico, *ISPRA*; C Lubritto, *Department of Environmental Science II Università di Napoli*

2:00 pm - 2:30 pm

15.2 Innovation and Improvement for Telstra's Australian Energy and Cooling Systems: A Ten Year Case Study

A Bradford; B J Cooper; I Gordon, *Silcar Pty Limited*

2:30 pm - 3:00 pm

15.3 Carbon Footprint of Next Generation Fixed Networks

P A Gemma, *Huawei*; G Griffa, *Telecom Italia*; D Han; A Andrae; B Zhu; S Luo, *Huawei*; C Bianco; F Cucchiatti, *Telecom Italia*

SESSION 16: SMART POWER GRID

Session Chair: Praveen Jain

Smart Grids and Distributed energy

3:30 pm - 4:00 pm

16.1 Plug & Play Operation of Distributed Energy Resources in Micro-Grids

P Tenti; A Costabeber; P Mattavelli; D Trombetti, *University of Padova*

4:00 pm - 4:30 pm

16.2 Intelligent Site Energy Consumption Monitoring

Q Fang, *Huawei Technologies China*; D Han, *Huawei Technologies GmbH Dusseldorf*; P Gemma, *Huawei Technologies Italy*; B Zhu, *Huawei Technologies China*; S Luo, *Huawei Technologies Dusseldorf GmbH*

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4:30 pm - 5:00 pm

16.3 Pulse Frequency Modulation with Soft-Switching Flyback Single Stage Inverter

A Tian; F Chen, *UCF*; K Rustom, *Petrasolar*; J Shen; I Batarseh, *UCF*

SESSION 17: RENEWABLE POWER GENERATION II

Session Chair: George Zguris

Real world application of renewable energy and how to tie to the grid

3:30 pm - 4:00 pm

17.1 Evaluation of Test Results in Hokuto Mega-Solar Project

H Konishi; K Asano; M Nagura; T Iwato; M Kudou; R Tanaka, *NTT Facilities Inc.*

4:00 pm - 4:30 pm

17.2 An Enhanced Stationary Reference Frame Control for Grid-Connected Distributed Power Generation Systems

A Moallem; A Bakhshai; P Jain, *Queen's University*

PANEL SESSION 3: GREEN TOPICS AND TECHNOLOGIES

8:00 am - 9:30 am

A panel of experts has been gathered to discuss current trends in the area of being green. What techniques, solutions and trends are happening right now and what does the future hold.

Dusty Becker, Emerson
Tom Flores, Verizon Wireless
Dan Kilper, Alcatel-Lucent
Praveen Jain, Queen's University
Paul Smith, Lineage Power

SESSION 18: CABINET COOLING

Session Chair: Ernie Farren

Techniques for thermal management in various applications. Real world, models and innovative techniques are presented

8:30 am - 9:00 am

18.1 CFD Modeling of Environmental System Options Used for Cooling of Telecommunication Shelters and Results from Global Field Installations

M Hendrix, *Andrew Solutions*

9:00 am - 9:30 am

18.2 Autocleaning Filter Used on Air Direct Cooling System Outdoor Cabinet

P A Gemma, *Huawei*; G Griffa, *Telecom Italia*; D Han, *huawei*; C Bianco; F Cucchiatti, *Telecom italia*; H Wang; W Zhang; Y Zhai; H Gan, *Huawei*

TECHNICAL PROGRAM

SESSION 19: PFC CONVERTERS

Session Chair: Ed Silverman

This session deals with the state-of-the-art developments in the power factor corrected converters, new PFC converter topologies, control techniques and active techniques to mitigate EMI

10:00 am - 10:30 am

19.1 A Comparative Study of AC-DC PWM Single-Stage Full-Bridge Converters

P Das; G Moschopoulos, *University of Western Ontario*

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10:30 am - 11:00 am

19.2 A High Power Factor Rectifier Associated with a ZCZVS Pwm Full-Bridge Inverter in a Rectifier/Inverter System

C A Gallo, *Federal University of Uberlandia*; F L Tofoli, *Universidade Federal de Sao Joao Del Rei*; R M Finzi Neto, *Universidade Federal de Goiás*; M C Chagas, *Federal University of Uberlandia*

11:00 am - 11:30 am

19.3 A New Digital Controller for a Single Stage Bi-Flyback PFC Converter

Q Zhang; O Abdel-Rahman; I Batarseh; J Shen, *University of Central Florida*

11:30 am - 12:00 pm

19.4 Conducted EMI in Grid-Tied PV System

D Hamza; P Jain, *Queens University*

12:00 pm - 12:30 pm

19.5 A Computational Small-Signal Modeling Technique for Switch Mode Converter

J W Lee, *DongAh Elecomm Corp*

SESSION 20: MHZ FREQUENCY CONVERTERS

Session Chair: Murray MacDonald

This session deals with the state-of-the-art advances in extremely high frequency switching converters, new digital control techniques and monolithic integrated converter topologies to achieve practical switching frequencies in MHz range.

10:00 am - 10:30 am

20.1 Integrated ZVS POL Synchronous Buck Converter for Portable Applications

Y Nour; M Orabi, *APEARC, South Valley University*; A Lotfi, *Enpirion Inc.*

10:30 am - 11:00 am

20.2 A Novel Integrated 50 MHz POL Solution Utilizing Internal OTA Compensation

Y Nour; S Nagar; M Orabi, *APEARC, South Valley University*; A Lotfi, *Enpirion Inc.*

11:30 am - 12:00 pm

20.3 MHz-Frequency Operation of Flyback Converter with Monolithic Self-Synchronized Rectifier (SSR)

H Jia, *University of Central Florida*; O Abdel-Rahman, *Apecor Inc*; K Padmanabhan; P Shea; I Batarseh; J Shen, *University of Central Florida*