

SC A1 ROTATING ELECTRICAL MACHINES

PS1: Developments of Rotating Machines and Experience in Service

- A1-101 CANCELLED - Unbalanced Magnetic Pull in Salient Pole Synchronous Machines A New Methodology to Calculate Orbital Eccentricity**
- A1-102 Fatigue Assessment in the Pole Fixation of Hydro-Generators**
T. HILDENGER, M. HAGMEYER, H. HENNING, D. LUDWIG - *BRAZIL*
- A1-103 Adjustable speed pumped storage system contributing in stabilization of power system**
T. ISHIZUKI - *JAPAN*
- A1-104 Upgrade from the fixed speed to adjustable speed (Okutataragi Pumped storage power plant)**
H. YAMASHITA - *JAPAN*
- A1-105 Ensuring High Quality Insulation System Of Large Motors – Design & Testing Requiring**
D.K. CHATURVEDI, A.K. GUPTA, P.K. BASU - *INDIA*
- A1-106 Efficiency and Cost-effectiveness comparison between Synchronous Reluctance Motor and Induction Motor**
B. H. KANG, L. FANG, J. H. SEO, J LEE - *KOREA*
- A1-107 Root Cause Analysis of 450 MVA generator stator core fault**
CHR. (CHRISTIAN) BOUWMEESTER - *NETHERLANDS*
- A1-108 Impact of turbogenerator uprating on its transient response in case of grid events**
L. ROUCO, J. ARCHILLA, C. GAVILÁN - *SPAIN*
- A1-109 Improved Generator Performance with a Nanocomposite High Voltage Insulation System for Stator Windings – A Status Report**
J. R. WEIDNER, T. HILDINGER, M. BROCKSCHMIDT, P. GRÖPPEL, M. WEIL - *GERMANY*
- A1-110 Flexible Generator-Converter System with Enhanced Grid Support Features - Design and Applications**
K. CHAN - *SWITZERLAND*
- A1-111 Voith Hydro's experience with the aging of insulation**
T. HILDINGER - *GERMANY*
- A1-112 Loss reduction of salient pole synchronous generator damper winding by means of slot skew**
J. ŠTUDIR - *CROATIA*
- A1-113 Optimized design of 4-pole Turbo Generator 2235 MVA platform**
P LAFOSSAS - *FRANCE*
- A1-114 analytical and Numerical Computation of Wound Fields Synchronous AC Generators**
SAIDA BOUGHRARA - *ALGERIA*
- A1-115 Calculation and Analysis of Dynamic Damper Bars Currents and Electromagnetic Force for a Generator-Motor Working as Synchronous Condenser**
D.J. TAO, Y.T. SUN, J.B. ZOU, B.J. GE - *CHINA*
- A1-116 Development of Larger Output Indirectly Hydrogen-cooled Turbine Generator with High Heat Transfer Main Insulation**
H. SAKO, K. KOGA, H. MAEDA, M. ONODA, K. TANAKA, Y. NAKAMURA - *SC A1*

SC A1 ROTATING ELECTRICAL MACHINES

PS2: Asset Management of Rotating Machines

- A1-201 Brazilian Experience with Development and Deployment of an Online PD Monitoring System on Rotating Machines Based on Virtual Instrumentation**
A.T. CARVALHO, H.P. AMORIM, F.S. BRASIL, P.R.M VILHENA, D.S. CARVALHO - *BRAZIL*
- A1-202 Progress in Interpreting On-line Partial Discharge Test Results from Motor and Generator Stator Windings**
H. SEDDING - *CANADA*
- A1-203 Assessment of manufacture quality of stator windings insulation of rotating machines by means of macrographic analysis**
R. BAENA, S. RODRÍGUEZ, A. VILLARRUBIA, B. REMARTÍNEZ, O. MARTÍNEZ - *SPAIN*

SC A1 ROTATING ELECTRICAL MACHINES

PS3: Rotating Machines for Renewable and Dispersed Generation

- A1-301 Development of a Methodology for the Design of Axial Flux Microgenerators**
R CRVICICH, J GARCIA, R PEGUEROLES - *ARGENTINA*
- A1-302 CANCELLED - Reliability of electrical generators in wind turbines**

SC A2 TRANSFORMERS

PS1: Advances in transformer diagnostic and monitoring

- A2-101 Remote Monitoring System and Analysis of Equipment Performance for Asset Management**
L.F. QUEIROZ, J.M. ARAUJO, P.V. ALMEIDA, R.J.C PADILHA, D.O. NETO, C.C. SANTOS, L.G. LIMA, A. ALTMANN, L.C.F SANTOS - *BRAZIL*
- A2-102 Determinants of Transformer Life and Sophistication of Deterioration Diagnosis Corresponding to Aging**
T. KIDO - *JAPAN*
- A2-103 Smart Monitoring of Power Transformers: Project Update**
T SAHA, D MARTIN, H MA, C EKANAYAKE, G RUSSELL, G BUCKLEY, T GRAY, G CALDWELL - *AUSTRALIA*
- A2-104 New Online Vibro-Acoustic Tap-Changer Diagnostic Method – First Results and Practical Experience**
M. FOATA - *CANADA*
- A2-105 Denoising of UHF Signals based on RBPF and the Localization of PD Sources using FDTD Method in Power Transformer**
W.H CHOI, S.W HWANG-BO, C.S PARK, J.S PARK - *KOREA*
- A2-106 Advanced Dissolved Gas Analysis(DGA) Diagnostic Methods with Estimation of Fault Location for Power Transformer Based on Field Database**
J.R. JUNG, H.D SEO, S.J KIM, S.W KIM - *KOREA*
- A2-107 Condition Assessment of Power Transformers in service using PD Monitoring**
H. GAGO, F. GARNACHO, M.A. SÁNCHEZ-URAN, J. ORTEGO, I. ULIARTE - *SPAIN*
- A2-108 Diagnosing difficult transformer problems using online condition monitoring**
S RYDER, H DING, R HEYWOOD, P JARMAN, S WHITE - *UNITED KINGDOM*
- A2-109 Condition monitoring and diagnostic assessment of transformers**
Z WANG, Q LIU, P JARMAN, G WILSON, R HOOTON, D WALKER, P DYER, CH. KRAUSE, PWR SMITH, A GYORE, R MARTIN, P MAVROMMATIS, J NOAKHES - *UNITED KINGDOM*
- A2-110 Transformer Health Index and Probability of Failure Based on Failure Mode Effects Analysis (FMEA) of a Reliability Centered Maintenance (RCM) Program**
P. LORIN - *SWITZERLAND*
- A2-111 Parameters influencing Partial Discharge Measurements and their Impact on Diagnosis, Monitoring and Acceptance Tests of Power Transformers**
S. COENEN - *GERMANY*

- A2-112 Assessment of Methanol as cellulose aging marker in mineral and ester oils**
ML COULIBALY - *FRANCE*
- A2-113 Expert System of Monitoring, Diagnostics and Control for Transformers (ESMDU_TRANS)**
L. KONTOROVYCH, A. BASS - *UKRAINE*
- A2-114 Improvements of Large Power Transformer Condition Real Time Monitoring and Diagnosis Expert System – a Romanian Experience**
C. MOLDOVEANU, M. FLOREA, A. RUSU, M. BUDAN, I. HATEGAN, P. STROICA, V. BREZOIANU, V. AURELIAN, M. AVRAMESCU, I. IONITA, S. SZLIVKA - *ROMANIA*
- A2-115 Interpretation of Results of Diagnostics of Power Transformers by Using the Frequency Response Analysis**
A.A. DROBYSHEVSKI, A.YU. VOLKOV, V.S. LARIN, D.A. MATVEEV - *RUSSIA*
- A2-116 Dynamic Behaviour of Fault Gases and Online Gas Sensors**
S. TENBOHLEN - *GERMANY*

SC A2 TRANSFORMERS

PS2: EHV / UHV and EHV DC / UHV DC Transformers and their components

- A2-201 Evaluation Method of VFT Stresses for Power Transformer Winding Design - Interaction Experience Between Manufacturer and Utility**
A. VITA, J. MONTANHA, E. OLIVEIRA - *BRAZIL*
- A2-202 Establishing Power Transformers Capability while under Geomagnetic Disturbances**
R. GIRGIS, J. VERNER, G. HOFFMAN - *USA*
- A2-203 3 Phase 420 kV Shunt Reactor manufacturing and quality sensitivity for vibration control – A case study**
V. MOORKATH, TANVI SRIVASTAVA, NILAD SEKHAR MITRA - *INDIA*
- A2-204 CANCELLED - The world's first 400 kV transformers filled with esters**
- A2-205 The proposal of permissible vibration level for power transformer and its accessories**
K.H. LEE, C.J. PARK, C.H. YANG, W.H. CHOI - *KOREA*
- A2-206 Short Circuit Design Conception and Validation of a 570 MVA, single-phase GSU-Transformer by SC-Withstand Tests on a Mock-up Unit**
M. CUESTO, J. PORRERO, M. MUÑOZ, J. CAMARA, P. HURLET, A. TANGUY, M. RYADI - *SPAIN*
- A2-207 Advanced designs of variable shunt reactors with on-load tap-changers for wider regulation range**
L. KIRCHNER - *GERMANY*
- A2-208 Large Power Transformers using Alternative Liquids - Experience in the range of 420 kV transmission level**
R. FRITSCHÉ - *GERMANY*
- A2-209 No-load long duration test experience to test the thermal performance of the transformer magnetic core**
M RYADI - *FRANCE*
- A2-210 Research and Application of UHV AC Transformers and Shunt Reactors**
X.C. HAN, X.N. WANG, N.H. WANG, B. LI, Z.R. WU, C.L. MI, X.L. ZHANG, J. T. ZHONG, S.B. SUN, S.J. WANG - *CHINA*
- A2-211 Fast Response Thyristor Controlled Shunt Reactor. Development and Application Experience**
A. ANTONOV, L. KOSOLAPOV, M. PESHKOV, M. PERNA, Y. GORYUSHIN, P. BULYKIN, L. KUBAREV, V. CHUPRIKOV - *RUSSIA*

SC A2 TRANSFORMERS

PS3: Transformer windings

- A2-301 Accelerated Transformer Aging using Upgraded Kraft and Natural Ester Insulation System**
K.J. RAPP, A.W. LEMM, A. TRUJILLO, J. LUKSICH - *USA*

- A2-302 Post-Failure Evaluation of Dielectric Performance of Winding of 38-y.o. Transformer Enhanced by On-Line Moisture Monitoring**
V DAVYDOV - AUSTRALIA
- A2-303 On-site replacement of OLTC, drying of winding insulation, induced voltage test with PD measurement of 250 MVA, 400/110 kV, 40 years old transformer**
R MALEWSKI, M SZROT, J PLOWUCHA, R KUBICKI - POLAND
- A2-304 Experiences and innovations in transformer short-circuit current withstand testing**
R.P.P. SMEETS - NETHERLANDS
- A2-305 Design of 154kV power transformer using natural ester oil**
B. H. BAE, S. E. KIM, S. W. PARK, Y. G. KIM, J. CHOI - KOREA
- A2-306 A Study on Inflammable Gas Generation according to Small Gap Discharge within Floating Electrodes by Induced Voltage in Power Transformer**
K. H. LEE, J. H. SONG, B. Y SEOK, H. M. KIM, I. R. CHOI - KOREA
- A2-307 Dry-type subtransmission transformer: dry power transformers for the 123 kV and 145 kV voltage class**
B. CRANGANU-CRETU - SWITZERLAND
- A2-308 Short-circuit testing of 66 kV / 34 MVA dry-type power transformer**
B. CRANGANU-CRETU - SWITZERLAND
- A2-309 Evaluation of the Thermal Performance of Transformer Windings by Numerical Investigations and Measurements**
S. TENBOHLEN - GERMANY
- A2-310 Novel Thermal-Hydraulic Network Model for Shell-Type Windings. Comparison with CFD and Experiments**
H.M.R CAMPELO, J.P.B BALTAZAR, C.M.M CARVALHO, R.C. LOPES, R.T. OLIVEIRA, C.M. FONTE, M.M. DIAS, J.C.B LOPES - PORTUGAL
- A2-311 Influence of the Lightning Impulse Shape on the Electrical Stresses on Windings Insulation of Power Transformers and Shunt Reactors**
V.S. LARIN, D.A. MATVEEV - RUSSIA

SC A3 HIGH VOLTAGE EQUIPMENT

PS1: High voltage equipment for emerging power system conditions

- A3-101 Overview of Non-intrusive Condition Assessment of T&D Switchgear**
N. UZELAC, R. PATER, C. HEINRICH - USA
- A3-102 Reduction of the TRV for Terminal Circuit Breakers on Series Compensated Lines**
B.R. SHPERLING, A.J. KERI, S. YANG, V.S. MAJJI, G. INGESTROM - USA
- A3-103 Survey on Requirements for Bus-transfer Current Switching**
S. TSUKAO - JAPAN
- A3-104 Voltage and Current Measurements for Smart Applications in Substations at Hydro-Québec**
F. ZAVODA - CANADA
- A3-105 Development of high voltage vacuum interrupter with earthed metal enclosure for the transmission line**
J. S RYU, C. Y. BAE, S. W. PARK, Y. G. KIM - KOREA
- A3-106 Development of HVDC Circuit Breaker with Fast Interruption Speed**
B. C. KIM, Y. H. CHUNG, H. D. HWANG - KOREA
- A3-107 Switching transients with simple transformer-line/cable configurations**
A. (ANTON) JANSSEN - NETHERLANDS
- A3-108 New test-methods for circuit breakers of 800kV and above**
R.P.P. SMEETS - NETHERLANDS

- A3-109 Test-circuits and testing of HVDC circuits breakers**
R.P.P. SMEETS - *NETHERLANDS*
- A3-110 Very fast transient over voltages on paper oil insulated inductive voltage transformers**
J. GARCÍA, A. IBERO - *SPAIN*
- A3-111 Inductive voltage transformers for auxiliary services power supply in substations. Design, specification and normative aspects and application example**
E. REGIL, A. BURGOS - *SPAIN*
- A3-112 Arresters with advanced cooling performance for protection of valves in HVDC converters**
R. GOEHLER - *GERMANY*
- A3-113 Environmentally Friendly Perfluoroketones-based Mixture as Switching Medium in High Voltage Circuit Breakers**
J.D. MANTILLA - *SWITZERLAND*
- A3-114 DETAILED ANALYSIS OF LIVETANKS, DEAD TANKS AND GAS CIRCUIT-BREAKERS USING A NEW ENVIRONMENTAL FRIENDLY GAS**
S SILVANT - *FRANCE*
- A3-115 METHODOLOGIES FOR POLLUTION TESTS ON COMPOSITE HOUSINGS**
G TESTIN, M. BOUTLENDJ, P. CARDANO, M. SARAVOLAC, M SEHOVAC, A. PIGINI, A. PASTORE - *ITALY*
- A3-116 Transient behaviour of conventional and innovative capacitive voltage transformers: simulations and HV laboratory testing**
C SERAFINO, P. AVAGNINA, A. VALANT, V. IULIANI, M. REBOLINI - *ITALY*
- A3-117 Research and Development of a Full-bridge Cascaded Hybrid HVDC Breaker for VSC-HVDC Applications**
G.F. TANG, X.G. WEI, W.D. ZHOU, S. ZHANG, C. GAO, Z.Y. HE, J. C. ZHENG - *CHINA*
- A3-118 The Establishment of Standard System for Accuracy Measurement of Harmonics of Electronic Voltage Transformers**
X. LIU, Z.Y. LI, H.Y. LIN, Y. TONG, X.Z. WANG - *CHINA*
- A3-119 In-adequate Damping Leading to Ferroresonance on Voltage Transformers: A Case Study**
ALAA RAHMA - *GULF STATES COMMITTEE*

SC A3 HIGH VOLTAGE EQUIPMENT

PS2: Lifetime management of transmission & distribution equipment

- A3-201 Challenges for managing overstresses and end of life of HV equipment**
A.C. CARVALHO, J.F. AMON, C. LINDNER, J-F. BOUDREAU, B.N.G SARDI, P.R. VASQUEZ, F. RICHTER, P. MOREAU - *BRAZIL*
- A3-202 Investigation on Contamination Deposit Performance and Pollution Withstand Voltage Characteristics of Polymer Devices**
H. KAGAWA - *JAPAN*
- A3-203 Transformation in Lifetime Asset Management of EHV Circuit Breakers – A Case Study**
B. DOIPHODE, S. KULKARNI, YASH KULKARNI, N.S. SODHA - *INDIA*
- A3-204 Contactless thermal online-monitoring of electrical equipment under load to determine the load level and damage avoidance**
T. GRAEF - *GERMANY*
- A3-205 D-Watch – intelligent disconnecter mechanism for digital substation**
E STELLA, M PIVATO, J RAYON - *ITALY*

SC A3 HIGH VOLTAGE EQUIPMENT

PS3: Application of information technology tools for development & management of high voltage equipment

- A3-301 Coupled Fluid-Mechanical Analysis Method in High-Voltage Circuit Breakers Design**
M. CUI, C.Y. BAE, J.Y. PARK, J. CHOI, S.W PARK, Y.G KIM - *KOREA*

- A3-302** **CFD ANALYSIS AND NUMERICAL STUDY OF THE HOT GAS FLOW INSIDE THE HIGH VOLTAGE GAS CIRCUIT BREAKERS**
J. H. PARK, M. J. HA, J. Y. BYEON, K. H. KIM - *KOREA*
- A3-303** **Reduced scale feasibility of temperature rise tests in substation connectors**
C. ABOMAILEK, J.R. RIBA, P. CASALS-TORRENS - *SPAIN*
- A3-304** **Power quality enhancement through optimum combination of controlled switching and low scatter CB drives**
F AIT-ABDELMALEK - *FRANCE*
- A3-305** **Mathematical and physical models development for study the high-voltage resistive dividers of digital voltage transformers**
V.D. LEBEDEV, A.A. YABLOKOV, A.V. MAKAROV - *RUSSIA*

SC B1 INSULATED CABLES

PS1: Feedback from newly installed or up graded cable systems

- B1-101** **Implementation Measures: An Overhead Transmission Line moves to Underground Transmission Line**
E.F. KARABOLAD, R.D. THOMAZ JR, N.H.G R. LOUREDO, W. GOVINO, G.C. SILVESTRE - *BRAZIL*
- B1-102** **Adoption of premolded joint and specialized cable installing method for the 275 kV XLPE cable underground transmission line in a tunnel**
S. KOBAYASHI - *JAPAN*
- B1-103** **220kV North Auckland and Northland (NAAn) Project in Auckland, New Zealand**
N RAHMAN - *AUSTRALIA*
- B1-104** **Monitoring and up-gradation of Underground Cable Network by various methods**
DILIP M. MIRASHI, N. SIRDESAI, M. KUMAR, KIRIT RANA - *INDIA*
- B1-105** **Mutual Inductive Interference of 400 kV Cable Systems**
R. MURATOVIC - *AUSTRIA*
- B1-106** **BC Hydro Experience to mitigate a hot spot along a 230kV XLPE cable circuit using a novel cooling solution**
S. CHERUKUPALLI - *CANADA*
- B1-107** **Development of AC 400kV XLPE Submarine Power Cable System**
S.B. LEE, S.Y KIM, H.S YOON, W.J. LEE, D.S CHO, S.H SON, H.D PARK, S.I JEON, J.Y KOO - *KOREA*
- B1-108** **Location of sheath voltage limiters (SVLs) used for accessory protection to assure the insulation coordination of cable outer sheath, sectionalising joints and terminations of high voltage cable systems**
F. GARNACHO, A. KHAMLICH, G. DENCHE, G. DONOSO, A. VALERO - *SPAIN*
- B1-109** **Cable system qualification process for the Italy - France HVDC intertie**
M. MARZINOTTO, M. ALBERTINI, L. BENARD, F: CHARLES, P. HONDAA, M. MAMMERI, M. PAZIENZA, K. TARDY - *ITALY*

SC B1 INSULATED CABLES

PS2: Best use of existing cable systems

- B1-201** **Maintenance Strategies Developed for the Underground Transmission Systems of ISA - Interconexión Eléctrica**
J.C.R LOPES, T.M. LIMA, A.P. LOZANO, M.S. MEDINA - *BRAZIL*
- B1-202** **Utility Experience with Field Condition Assessment of High Voltage Underground Cable Systems**
E.C. BASCOM III, M.A. PASHA, V.D. ANTONIELLO - *USA*
- B1-203** **Field Testing of high Voltage Cable: The Experience with AC Test on 115 kV Cables in MEA Thailand**
A RAJAKROM - *THAILAND*
- B1-204** **CANCELLED - Using DTS Data to Establish Soil Thermal Resistivity Characteristics**

- B1-205 Learning from on-line monitoring of medium voltage power cables – with PD and fault location**
B.C. VAN MAANEN - *NETHERLANDS*
- B1-206 Measurements and FEA results of steel armour losses in three-core submarine XLPE cables**
J.M. LEE, D.J PARK, G.Y JEONG, C.H LEE, J.N KIM, S.I JEON, H.D PARK, J. KAUMANNNS - *KOREA*
- B1-207 Improvement of Dissolved Gas Analysis Technique for Oil-Filled Cable Facilities and Practical Application of Gas Analysis Technique to XLPE Cable Facilities**
M. SOGA - *JAPAN*
- B1-208 Development of a Robot for Maintenance Work in the Spanish-French Electrical Interconnection Tunnel**
J. ARÉVALO - *SPAIN*
- B1-209 Sheath currents monitoring in high voltage isolated cables**
A. BURGOS, G. DONOSO, B. GARCÍA - *SPAIN*
- B1-210 Transmission capacity management of subsea cables for the grid connection of offshore wind farms**
C. RATHKE - *GERMANY*
- B1-211 Maintenance strategies for MV/HV subsea cable networks**
R GIUSSANI, R WILSON, M SELTZER-GRANT - *UNITED KINGDOM*
- B1-212 Life Cycle Assessment (LCA) of a 380 kV double circuit HVAC cable transmission line**
L GUIZZO, M REBOLINI, A POSATI, K BERNARDI, S FILIPPINI, A FIORELLA, G ZA, G LAVECCHIA - *ITALY*
- B1-213 Belgian experience with real time temperature system in combination with distributed temperature sensing techniques**
P. LEEMANS, B. MAMPAEY - *BELGIUM*
- B1-214 Fire Safety of Cables in Power Grid: Tracking Combustion Test Standards of Cables and New Insights on Test Framework**
J.Q. ZHANG, M.H. FAN, W. LI, H. XIE, H. C. WU, S.P. WANG - *CHINA*
- B1-215 Submarine Cable Location. New technology – development and testing**
O HOBBERSTAD - *NORWAY*
- B1-216 Current Rating and Risk of Cavity-Induced Breakdown in Mass Impregnated Non-Draining HVDC Subsea Cables**
M. RUNDE - *NORWAY*
- B1-217 Application of Partial Discharge Diagnostic technique on High Voltage Cable sealing ends to predict catastrophic failures with supportive case study**
K. SRIRAMAKAVACHAM - *GULF STATES COMMITTEE*

SC B1 INSULATED CABLES

PS3: Insulated cables in the Power System of the Future

- B1-301 A new voltage level for extruded DC cables**
MARKU SALTZER, A. GUSTAFSSON, M, JEROENSE, M. GHORBANI, T. QUIST, P. BERGELIN - *SWEDEN*
- B1-302 Development of the Riser Cable System for Offshore Floating Wind Power Project**
Y. TATENO - *JAPAN*
- B1-303 Systematic Description of Dynamic Load for Cables for Offshore Wind Farms. Method and Experience**
T. KVARTS, R. OLSEN, POUL MORTENSEN, IVAN ARANA - *DENMARK*
- B1-304 Understanding losses in three core armoured submarine cables**
FILIP FARIA DA SILVA, T. EBDRUP, CLAUS LETH BAK, CHR.F JENSEN - *DENMARK*
- B1-305 NEW TRANSITION JOINT**
B GONZÁLEZ SARDI, H GRINSCHPUN, I RUIZ - *ARGENTINA*
- B1-306 Use of aluminium for Cable Conductors and sheaths in EHV power cable systems**
T. (TOMASZ) KOLTUNOWICZ - *NETHERLANDS*

- B1-307 EFFECT OF ULTRAVIOLET RADIATIONS AND SANDSTORMS ON THE FLASHOVER VOLTAGE OF SILICONE RUBBER CABLE TERMINATIONS**
L.S. NASRAT - *EGYPT*
- B1-308 Simplified Undergrounding of 400 kV Overhead Lines with Superconducting Cable Systems**
M. STEMMLE - *GERMANY*
- B1-309 After Laying Tests on Long HVAC and HVDC Extruded insulated Cable Systems**
F LESUR - *FRANCE*
- B1-310 400kV – 2 x 1000MW Submarine Cable Crossing of the Dardanelles Strait**
F. KOKSAL - *TURKEY*
- B1-311 Optimization of Submarine Cable Structure Based on Ampacity**
E.D. WANG, X. Y. ZHANG, B. BIAN, X. L. MA, T. J. QIU, J. WANG - *CHINA*
- B1-312 The world longest and deepest 430 kV XLPE submarine cable**
A STAMSAAS - *NORWAY*
- B1-313 Thermal characterization of seabed along the NordLink cable route – results and comparison of measurements methods**
G EVENSET - *NORWAY*
- B1-314 Effect of Water Pipeline on Ampacity of Underground Cables: Case Study**
M. S. BAAZZIM - *GULF STATES COMMITTEE*

SC B2 OVERHEAD LINES

PS1: Overhead Lines for high power transfer capacity

- B2-101 HVDC ± 800 kV Transmission Line Associated to the Belo Monte Hydroelectric Power Plant - Studies and Definitions for the Basic Design - Innovation and Challenges for a New Level of Voltage in Brazil**
M.C. ARAUJO, J.H.M FERNANDES, K.R. SANTOS, H.W.C SILVA, J.L.N MICHELINI FILHO, R.G. NOEL, B.S. PERRO, P.C.P SILVA JR, A. QUINTILIANO - *BRAZIL*
- B2-102 Increasing the transfer capacity of overhead lines on the connection of wind power plants, through correlation between climatic data and temperature of conductors at higher currents**
O. REGIS JR., L.A.M DOMINGUES - *BRAZIL*
- B2-103 Prospective DC Conversion of a Major 345 kV AC Line**
B. MEHRABAN, R. DOLAN, C. CASABLANCA, L. BARTHOLD, D. WOODFORD, R. ADAPA - *USA*
- B2-104 Assessment of HTLS Conductors to Increase the Power Transfer in the Mexican Electric Transmission System**
R. CASTELLANOS, M. RAMIREZ, C. SMITH - *MEXICO*
- B2-105 Operational aspects of dynamic line rating. Application to a real case of grid integration of wind farms**
A. GONZÁLEZ, M. MAÑANA, R. MÍNGUEZ, R. DOMINGO, J. GONZÁLEZ, R. GARROTE, A. ARROYO, R. MARTÍNEZ, A. LASO - *SPAIN*
- B2-106 Compact lines with pivoted insulated cross-arms. General stability design criteria**
P. RODRÍGUEZ, J.C. POLO, L.F. ALVARADO, A. CARNICERO, J. JIMENEZ-OCTAVIO, C. SÁNCHEZ-REBOLLO - *SPAIN*
- B2-107 A 500 kV HVAC circuit reconversion into a ± 500 kV HVDC bipole line in the Central Interconnected System (Chile)**
A. ALEGRIA - *CHILE*
- B2-108 Verification of thermal rating calculations for high temperature low sag (HTLS) conductors**
T. FREHN - *GERMANY*
- B2-109 Assessment on the ignition of electric arc and flashover distances between overhead transmission lines and the surrounding vegetation**
M FORTELEONI, A POSATI, E COLOMBO, G PANNUNZIO - *ITALY*
- B2-110 Monopole 220 kV tubular tower of steel tubes and cast steel without visible connections.**
A.B. JONASSON, TH. BJARNASON, N. GUSTAVSSON, E.TH. INGOLFSSON, O. SKARPHEDINSSON, A.N. ANDRESSON - *ICELAND*
- B2-111 Operation Experience of 1000 kV Ultra High Voltage AC Transmission Technology**
Y.B. SHU - *CHINA*

- B2-112 Design Verification by Analysis of Transmission Lines Exposed to Large Topographic Variations, Temperature Changes and Extreme Ice Loads**
O.C. WROLDSEN - *NORWAY*
- B2-113 Design and engineering of a new 525 kV HVDC line in Norway**
B. THORSTEINSSON - *NORWAY*
- B2-114 Monitoring and forecasting ice loads on a 420 kV transmission line in extreme climatic conditions**
B NYGAARD - *NORWAY*
- B2-115 Compact controllable 110 – 500 kV overhead lines**
L TIMASHOVA, Y SHAKARIAN, S KAREVA, V POSTOLATI, E BYCOVA, Y GORYUSHIN - *RUSSIA*

SC B2 OVERHEAD LINES

PS2: Project management, construction and maintenance

- B2-201 Calculation Accuracy of High-Temperature Sag for ACSR in Existing Lines**
D.A. DOUGLASS, G.C. SIBILANT, D. LOUDON, R.G. STEPHEN - *USA*
- B2-202 The Development of Electric Wires of High Tensile Strength and Corrosion Resistance, and Their Application to Renewal of 500 kV Long Span Transmission Lines Crossing the Strait**
H. SASAKI - *JAPAN*
- B2-203 Innovation in Evaluating and Managing the Reliability of Aged Transmission Structures**
R KULKARNI, J MCCORMACK - *AUSTRALIA*
- B2-204 Execution Of Transmission Projects With Innovative Methods For Augmentation Of EHV Network In Mega City Of Mumbai – Challenges & Solutions**
U.K. MAHARAJA, V. SURANGE, P. MURUGAN, S. DESHMUKH, P.S. VERMA, M.V. DEODHAR - *INDIA*
- B2-205 A New Model for Developing, Constructing, Financing and Operating Major Transmission Projects in Alberta**
E. GHANNOUM - *CANADA*
- B2-206 A portable digital X-Ray system for the in-situ detection of ACSR broken strands at suspension clamps: field results and introduction onto Line Scout Robotic Technology**
N. POULIOT - *CANADA*
- B2-207 The new tower lifting method for the 345kV transmission lines**
B. H. KIM, C. H. PARK, S. G. BAN, H. K. KIM - *KOREA*
- B2-208 Research into an increased number of unexplained line outages of polymeric insulator sets used within the Czech transmission grid**
JAN LACHMAN - *CZECH & SLOVAK Reps.*
- B2-209 Improved Efficiencies in Conductor Stringing**
A OSCAR, S NEVE - *UNITED KINGDOM*
- B2-210 A novel HTLS thermo-mechanical model: applications to Italian OHTL.**
P PELACCHI, G LUTZEMBERGER, M GIUNTOLI, D POLI, F BASSI, G GIANNUZZI, A PICCININ - *ITALY*
- B2-211 Real Time Measurements for Online Monitoring and Intelligent Management of High Voltage Transmission Lines**
C. MOLDOVEANU, A. RUSU, M. FLOREA, M. VAJU, N. BALTA, I. HATEGAN, S. ZAHARESCU, M. AVRAMESCU, P. CURIAC, V. AURELIAN, B. TOADER, I. IONITA, F. GONI, C. RADU, AL. SZLIVKA - *ROMANIA*
- B2-212 Condition Assessment of Overhead Line Convertors by the Pulse Current Method**
S HELLESO - *NORWAY*

SC B2 OVERHEAD LINES

PS3: Application of new materials and technologies

- B2-301 Innovation-Section: test-run for uprating 220 kV to 380 kV using insulated cross arms and coated conductors**
K. REICH - *AUSTRIA*

- B2-302 Testing Steel Lattice Towers with a Hybrid (Numerical / Experimental) Method**
A. LOIGNON - CANADA
- B2-303 Development of Estimating Method for Conductor corrosion and High corrosion resistant Conductor for overhead transmission lines**
N. SHIMIZU - JAPAN
- B2-304 Appropriateness of concrete poles for 400 kV Wintrack II**
A.J.P. (TON) VAN DER WEKKEN - NETHERLANDS
- B2-305 Temperature Profile along an Overhead Line Conductor in and near the Tension Clamp**
P.B. BUEHLMANN - SWITZERLAND
- B2-306 Comparative Investigations of Hydrophobicity Effects and Erosion Resistance of Silicone Rubber used for Housings of AC and DC Insulators**
F. SCHMUCK - SWITZERLAND
- B2-307 CompactLine – a new Overhead Transmission Line Concept**
S. BEHREND - GERMANY
- B2-308 A new design of high voltage overhead line using composite poles**
T RAULT - FRANCE
- B2-309 Design, testing and installation of innovative 380 kV Dutton–Rosental towers**
P BERARDI, M FORTELEONI, M MARZINOTTO, A PICCININ, A POSATI, M REBOLINI - ITALY
- B2-310 Development of 1250mm² Large Cross-Section Conductors for UHV DC Transmission Lines**
K.J. ZHU, B. LIU, Z. LIU, Y. QI, J.J SI, Y.F. CHENG, J.C. WANG - CHINA
- B2-311 Proposals for additions to IEC requirements intended to verify quality of glass cap and pin insulators**
K. HALSAN - NORWAY
- B2-312 CANCELLED - Spacer Damper Problems on Quad Bundle Lines in National Grid, Saudi Arabia**
- B2-313 Corona noise comparison of the standard and surface treated conductors obtained with monitoring of the newly erected 400 kV line and with corona testing in high-voltage laboratory**
I ROZMAN - SLOVENIA

SC B3 SUBSTATIONS

PS1: Advances in substation technology

- B3-101 Non-Conventional Instrument Transformers for Improved Substation Design**
LJ.A. KOJOVIC - USA
- B3-102 Ceramic and Hybrid Support Insulators for UHVDC Systems**
G. GOEDEL - AUSTRIA
- B3-103 Substation Automation from Conventional to full Digital Technologies – Case Studies and Impact**
P. KALKY, R. BHARAT, S. DEY, S. MAKWANA - INDIA
- B3-104 High Power Underground Transmission for HV DC**
H. KOCH - GERMANY
- B3-105 170 kV pilot installation with a ketone based insulation gas with first experience from operation in the grid**
T. DIGGELMANN - SWITZERLAND
- B3-106 Application of a fluoronitrile gas in GIS and GIL as an environmental friendly alternative to SF₆**
D. GAUTSCHI - SWITZERLAND
- B3-107 Dielectric testing of GIS RC-dividers for HVDC GIS/GIL substations with increased dielectric requirements**
E. SPERLING - SWITZERLAND

- B3-108 Advanced insulation and switching concepts for next generation High Voltage Substations**
N. PRESSER - *GERMANY*
- B3-109 Basic features of the new 145 kV metal-enclosed, SF6 gas-insulated switchgear**
D. GORENC - *CROATIA*
- B3-110 2nd generation DC grid access for offshore wind farms: “HVDC in an AC fashion”**
O. KUHN, P. MENKE, R. ZUROWSKI, T. CHRIST, S. SEMAN, G. GIERING, T. HAMMER, D. IMAMOVIC, J. THISTED, P. BROGN, N. GOLDENBAUM - *SC B3*
- B3-111 Customer process for technical qualification of NCIT-products for high-voltage GIS applications**
W OLSZEWSKI - *FRANCE*
- B3-112 ABB PASS M0S 420kV for transmission substation**
M. SPINELLI, R. CAMERONI, C. GRANATA - *ITALY*
- B3-113 CANCELLED - Pilot project principles for a digital substation**
- B3-114 An Autonomous Intelligent Robot for Electronic Equipment Inspection Used in Substation**
L. LI, G.B. WU, S.Y. MU, M.C. FU, J. L. ZHAO, R. GUO, J.X. LI - *CHINA*
- B3-115 High Frequency Current in the Power System and Its Influence on Transfer Accuracy of Electronic Current Transformer**
C. ZHANG, X. N. KANG, Y. K. ZHENG, J.F. JI, M. Z. LIU, Y. B. YUAN - *CHINA*

SC B3 SUBSTATIONS

PS2: Developments and new thinking in substation design

- B3-201 Applying mixed technology switchgear (MTS) for adaptation of substations to meet new Brazilian power system requirements of availability**
C.S.S XAVIER, F.N. FRAGA, A.V. GODOY, P.R.P SIMÕES - *BRAZIL*
- B3-202 Brown Field Implementation of an IEC 61850 Based Integrated Protection and Automation System**
M. PIMENTA, D. BURKART, M. SEITER, D. PRATT, O. OMELCHENKO, I. ANDINO, T. MCMULLEN - *USA*
- B3-203 Integrating In-house IEC61850 Technology into Existing Substation:A Case of EGAT Substation Control System**
V KONGTHON - *THAILAND*
- B3-204 Countermeasures in a substations for large renewable energy adoption**
K. UEHARA - *JAPAN*
- B3-205 Integrating IEC61850 into Existing Substations in MEA’s Distribution System**
P JINTAGOSONWIT - *THAILAND*
- B3-206 Retrofitting and Modernization of Conventional Substation to An IEC 61850 Based Automated Substation – A Case Study of 400KV Amreli Substation**
N.M. SHETH, S.K. JADAV, B.J. PATEL - *INDIA*
- B3-207 50kV switchgear lost? Up & running in 30 hours solution!**
P. (PIET) KNOL - *NETHERLANDS*
- B3-208 Bus-Node - A Novel Substation Concept**
G.S. KOEPL, TH. ASCHWANDEN, P. ZINNIKER - *SWITZERLAND*
- B3-209 Implementation of Building Information Modelling (BIM) process in substation design software to increase design quality**
M KOKORUŠ, W EYRICH, R GACANOVIC - *BOSNIA HERZEGOVINA*
- B3-210 Mitigation of the Impact of Increasing Short Circuit Levels on Aging Transmission Substation Structures in Ireland**
J DUNNEY - *IRELAND*
- B3-211 Integration of an IEC 61850 process bus in an existing substation**
T BUHAGIAR - *FRANCE*

B3-212 CANCELLED - Design and implementation of NTP and SNTP time synchronization using Ethernet architecture

B3-213 Development of common technical requirements for monitoring and diagnostic systems to improve availability of substations

L.A. DARIAN, R.M. OBRAZTSOV - *RUSSIA*

B3-214 Completing the IEC 61850 substation – the need for metering

R. HUGHES, K. HINKLEY - *SC B3*

SC B3 SUBSTATIONS

PS3: Evolution in Substation Management

B3-301 RF Sensors Development and Condition Metric Development for Contaminated Substation Insulation

A.J. PHILLIPS, D. MCGUIRE, C.S. ENGELBRECHT - *USA*

B3-302 Current situation and Recent Challenges in Asset Management of Aging T&D Substation Facilities in Japan

T. KOBAYASHI - *JAPAN*

B3-303 Development of a Substation Fire Management Strategy and the implementation of a Hypoxic Fire Prevention System

M VERRIER, D ELLIS, D KRUIJVER - *AUSTRALIA*

B3-304 Operational Experience In 1200kV (UHVAC) National Test Station, India

B.N. BHOWMICK, I.S. JHA, S.B.R RAO, R. DHYEYA SHAH, R. SRIVASTAVA, R.K. SINGH, PROF. S.V. KULKARNI, S. KUMAR - *INDIA*

B3-305 Partial Discharge Diagnosis Method using Non-phase Synchronized UHF PD Pattern based on On-site Measurement Database for Substation

J.R JUNG, Y.M KIM, S.W KIM, J.B KIM - *KOREA*

B3-306 CANCELLED - Experiences in Gas Insulated Substation tests, on factory and acceptance test on site after installation

B3-307 Evaluation of the High Voltage Gas Insulated Substations (GIS) Based on Flashovers in the 220 kV Switchgears

ADEL EL FARASKOURY - *EGYPT*

B3-308 Removing risk of eventual discharges between GIS grounding parts and cable sheath connected to the substation earth through a separate grounding lead

F. GARNACHO, A. KHAMLICHI, G. DONOSO, G. DENCHE, A. VALERO - *SPAIN*

B3-309 Impact of Renewable Grid Code compliance on Substation design

J.M. GALLEGRO, A. CASTRO, A. MELERO, S. MINGUEZ - *SPAIN*

B3-310 Enablers for Cost Saving in Air Insulated Substation Asset Management

H. CUNNINGHAM, R. MIGNE, A. WILSON ON BEHALF OF CIGRE WG B3.32 - *SC B3*

B3-311 Life extension program for GIS Circuit breaker retrofitting Le Havre Project

R LAGARTINHO - *FRANCE*

B3-312 Using indicators to screen and monitor substation vulnerability affecting security of supply

E GRAMME - *NORWAY*

B3-313 CANCELLED - Optimal Design of Grounding System for HV/EHV AC Substation

SC B4 HVDC AND POWER ELECTRONIC SYSTEMS

PS1: HVDC systems and their applications

B4-101 A second and longer ± 800 kV DC bipole completes Belo Monte's integration

D.S. CARVALHO JR., A.M. SILVA, J.H. ALMEIDA, T.C RIZZOTTO, M.J. XIMENES, F. ALVES, A.M. PENA, O.J. ROTHSTEIN, R. RISTOW, R. AZEVEDO, J.A CARDOSO, R. BROETTO, M.P. MONTEIRO, A. DIAS JR, F.C. JUSAN - *BRAZIL*

- B4-102 Semi-fullbridge Modular Multilevel Converter: An Inherent DC Fault Current Limiting Topology**
E.H. WATANABE, J.R. LEBRE, P.M.M PORTUGAL - *BRAZIL*
- B4-103 Smooth coordination and management of impact of EstLink 2 transmission testing on electricity markets, power system operations and system technical performance**
T RAUHALA - *FINLAND*
- B4-104 Celilo HVdc Terminal Upgrade Project – Pacific NW-SW HVdc Intertie System**
M.A. REYNOLDS, B.C. FURUMASU, D. KELL, K.A. MITSCH, O. SAKSVIK, T. HOLMGREN, S.J. KHEIR - *USA*
- B4-105 Protective Firing in LCC HVDC: Purposes and Present principles. Settings and behavior**
P. KARLSSON, V.F. LESCALE VILES - *SWEDEN*
- B4-106 HVDC POWER FROM SHORE**
G. PERSSON, B. WESTMAN, K. ERIKSSON, A. MAELAND - *SWEDEN*
- B4-107 50 years of Operating Experience of Sakuma Frequency Converter Station - Changing Roles in the Japanese Power System's Transition**
Y. MAKINO - *JAPAN*
- B4-108 Zambezi (previously Caprivi) Link HVDC Interconnector: Review of Operational Performance in the First Five Years**
THOMAS, TG MAGG - *SOUTH AFRICA*
- B4-109 Commissioning Experience and Challenges of World's First 800 kV, 6000 MW NER – Agra Multi terminal HVDC System**
M.S. RAO, N. KUMAR, B.B. MUKHERJEE, R. KUMAR, M.M. GOSWAMI, O. CHANDY - *INDIA*
- B4-110 AC-DC Interaction Study For Upcoming \pm 800 kV, 3000 MW Champa Kurukshetra HVDC Link**
M. VARDIKAR, V. SINGH, M.S. RAO, V. BAGADIA, M.M. GOSWAMI, O. CHANDY - *INDIA*
- B4-111 Converter Transformer Inrush Control Using Hybrid Pre-insertion Resistors and Point-on-Wave Switching in the New Zealand HVDC System**
J. HU - *CANADA*
- B4-112 Using Classic LCC HVdc to Transmit Renewable Energy from Weak AC Systems**
D. KELL - *CANADA*
- B4-113 HVDC Overhead Line Design Considering LCC vs. VSC Technology**
P. WANG - *CANADA*
- B4-114 Nelson River Pole 1 Thyristor Leakage Assessment & Online Monitoring**
X. LI - *CANADA*
- B4-115 Enabling DC Fault Blocking Capability of Hybrid Modular Multilevel Converter HVDC using Asymmetrical Full-bridge Submodule**
K. HUR, H KIM, J KANG, S KIM, J NA, D LEE, Y KWON - *KOREA*
- B4-116 Test Circuit for Voltage Sourced Converter Valve in MMC-Based HVDC**
Y. H. CHUNG, S. T. BAEK, J. H. LEE, E. C. NHO, J. H. JUNG - *KOREA*
- B4-117 Operational experience of new Spain-France HVDC interconnection**
J. BOLA, R. RIVAS, R. FERNÁNDEZ-ALONSO, G. PÉREZ, J. HIDALGO, L.M. CORONADO, C. LONGÁS, S. SANZ, G. LEMARCHAND, J. ROGUIN, D. GLAISE - *SPAIN*
- B4-118 A closer look at protection concepts for DC systems**
E. SPAHIC - *GERMANY*
- B4-119 Improving the DC fault response of H-bridge MMC-based HVDC Networks**
E. KONTOS - *NETHERLANDS*
- B4-120 Automated Operation of Parallel VSC HVDC Links Embedded in an AC Power System**
K. FREY - *GERMANY*
- B4-121 Diode-Rectifier HVDC link to onshore power systems: Dynamic performance of wind turbine generators and Reliability of liquid immersed HVDC Diode Rectifier Units**
T. HAMMER, S. SEMAN, P. MENKE, F. HACKER, B. SZANGOLIES, J. METH, J. DORN, K. LOPPACH, R. ZUROWSKI - *GERMANY*

- B4-122** **EMTP simulation verification of full bridge MMC HVDC operational advantages**
D JOVICIC, W LIN, S NGUEFEU, H SAAD - *UNITED KINGDOM*
- B4-123** **Feedback on IFA 2000 France-England Refurbishment Project**
A DROUET D'AUBIGNY - *FRANCE*
- B4-124** **Feedback on INELFE France Spain HVDC Project**
J LONCLE - *FRANCE*
- B4-125** **Commutation failures mitigation in multi-infeed network with high renewable penetration: TERNA's experience**
F. PALONE, M. DE SIMONE, S. GENTILI, G.M. GIANNUZZI, M. REBOLINI, R. ZAOTTINI - *ITALY*
- B4-126** **Communication-free control solution for the provision of frequency regulation services in HVDC grids: Numerical simulation and experimental validation in a reduced scale platforms**
C.L. MOREIRA, J.R. GOUVEIA, J. RODRIGUES, B. SILVA, J.A. PEÇAS LOPES - *PORTUGAL*
- B4-127** **Study of Backbone Structure Change from Synchronous to Asynchronous in China Southern Power Grid**
B.R. ZHOU, C. HONG, X.M. JIN, T. WANG, H.X. LI, L. HUANG - *CHINA*
- B4-128** **Interaction between parallel HVDC an AC overhead lines**
S. BODAL - *NORWAY*
- B4-129** **Experience from a bipolar HVDC system with a Voltage Source Converter and a Line Commutating Converter**
T. MIDTSUND - *NORWAY*
- B4-130** **Saudi Arabia Central-West HVDC Project: 3500 MW ±600 kV LCC 800 km High Performance embedded link crossing a desert area**
A. H. AL-MUBARAK - *GULF STATES COMMITTEE*
- B4-131** **SURVEY OF THE RELIABILITY OF HVDC SYSTEMS THROUGHOUT THE WORLD DURING 2013 – 2014**
M.G. BENNETT, N.S. DHALIWAL - *SC B4*
- B4-132** **Design consideration associated with DoWin3 and evolution of GE's Grid Solutions Business VSC Solution**
D. FONTEYNE, P.L KHILAR, M BODEN - *UNITED KINGDOM*

SC B4 HVDC AND POWER ELECTRONIC SYSTEMS

PS2: FACTS and other Power Electronic (PE) systems for transmission

- B4-201** **Brazilian Experience Regarding Interactions between Series Capacitors and SVCs - Main challenges of the Tucuruí-Macapa-Manaus Interconnection Project**
A.R.M TENÓRIO, A.F.C AQUINO, A.A. NOHARA - *BRAZIL*
- B4-202** **Blocking reactor as part of SVC system - a novel concept for harmonics reduction and lowered operational losses**
J AHO - *FINLAND*
- B4-203** **Comparison of Switching Schemes for STATCOMs using Modular Multi-Level Converters**
J TURUNEN - *FINLAND*
- B4-204** **Acoustic aspects for Air Core Dry Type Reactors - Specification, Design, Testing, Field Measurements**
P. DOPPLMAIR - *AUSTRIA*
- B4-205** **Essex STATCOM Life Assessment and Extension**
J. BURROUGHS - *CANADA*
- B4-206** **Planning and commissioning of 130MVA GCT-STATCOM for transient stability improvement**
H. IWANE - *JAPAN*
- B4-207** **IGBT Explosion Test for STATCOM Sub-module**
J. H. OH, Y. S. HAN, Y. H. PARK, D. Y. LEE, J. K. JEONG, H. J. JEONG - *KOREA*
- B4-208** **Harmonic Performance Requirements and Mitigation for back-to-back HVDC in Turkish Transmission System**
E. PARTAL - *TURKEY*

B4-209 Magnetically controlled shunt reactor use in 110-500 kV power grids

S.V. SMOLOVIK, A.N. BELYAEV, A.M. BRYANTSEV - *RUSSIA*

B4-210 Electrical Test of STATCOM Valves

B. SHENG, C. DANIELSSON, R. NEBBERT, J. TURUNEN, Y. LAN, X. FAN, H. ZHANG, F. NAKANURA - *SWEDEN*

SC B4 HVDC AND POWER ELECTRONIC SYSTEMS

PS3: DC and other Power Electronic (PE) systems for distribution

B4-301 Studies for Characterisation of Electrical Properties of DC Collection System in Offshore Wind Farms

YU-HS CHEN, C.G DINCAN, R.J OLSEN, MA-CH SHIMMELMANN, P. KJÆR, C.L. BAK - *DENMARK*

B4-302 Evaluation of the potential market for MVDC technology in Scotland

S HAY, G MCFADZEAN, C CLEARY - *UNITED KINGDOM*

B4-303 Integrating Smart Solid State Transformers Into Distribution Substations

S. AWILI - *IRELAND*

SC B5 PROTECTION AND AUTOMATION

PS1: Protection Automation and Control System (PACS) Optimization and Life Time Asset Management

B5-101 Recording and Documentation Criteria Proposed for the Complete Life Cycle of Digital Substation Automation Systems in Brazil - Findings and Trends

M.E.C PAULINO, A. CASCAES, D.G. FERREIRA, D. LELLYS, G.S. PENARIOL, J.C.M LIMA, M.R. BASTOS, P.H. FLORES, U.A. CARMO - *BRAZIL*

B5-102 Comparison of Risk Assessment Approaches in Wide Area Protection Coordination

B. GWYN, S. ALAEDDINI, I. ANAND, A. GOPALAKRISHNAN, G. WEBSTER, J. SCHMIDT, D. WONG, J. STORER, P. NYOMBI, G. SARKINEN, A. MULAWARMAN, M. GUTZMAN - *USA*

B5-103 Innovative Wide-area and Local Voltage Control of Dynamic Shunt Compensation Devices to Prevent Voltage Collapse

M. PERRON - *CANADA*

B5-104 Concept and Method of Replacement of Protection Relay and Control Equipment

T. KAWAKAMI - *JAPAN*

B5-105 Evaluation of Compensating Saturation Algorithms for Protective Current Transformers

EHAB M. ESMAIL - *EGYPT*

B5-106 Towards the plug&play challenge, pursuing the goal of streamline Distribution Grid Management and Maintenance

Z. OJINAGA, I. AUZOKOA, J.M. GARCÍA, I. OJANGUREN - *SPAIN*

B5-107 Functional Integration and IEC 61850 to optimise substation automation system design

C. RODRÍGUEZ, E. VILLARREAL, J. FIGUERA, D. PRIETO, J. DELGADO, M. ORDUÑEZ - *SPAIN*

B5-108 Automatic configuration management for PACS

M. OBRIST - *SWITZERLAND*

B5-109 Optimization techniques reducing periodic maintenance and retrofit outage times with digital substation technology

T. WERNER - *SWITZERLAND*

B5-110 The role of protection performance audits in the lifetime management of protection systems

P WATSON, A SUBBU - *UNITED KINGDOM*

B5-111 System Redundancy in Power Substation Retrofits

D. LAI - *TAIWAN*

B5-112 Lifecycle management of existing PACS including maintenance and design at Rte

J NOE - *FRANCE*

B5-113 Automatic system for gathering data from IEDs - implementation specifics in Ukrainian power engineering

D VOITOV, B STOJNI, F PANOV - *UKRAINE*

- B5-114 Improving the Fault Location for Romanian Power Transmission Lines using the Existing Measurements**
M. DRAGOMIR, A. MIRON, GH. MORARU, A. DRAGOMIR - *ROMANIA*
- B5-115 Towards optimized digital substation automation systems**
R. PAULO, J. ELISEU, J.P. PEREIRA - *PORTUGAL*
- B5-116 Protection, Automation and Control (PAC) LifeTime Management for Transmission and Distribution utilities: Commonalities and Contrasts**
R HUEBNER - *NEW ZEALAND*
- B5-117 The Identification of Transmission Line Overload and Faults Based on Voltage Plane**
H.Z. LIU, Z.X. ZHOU, D.L. WANG, X.G. WANG, D.X. DU - *CHINA*
- B5-118 Reliability Improvements on IEC 61850 Process Bus Application**
L. LI, G. YANG, H. LV - *CHINA*
- B5-119 CANCELLED - Case Study for Distance Protection on EHV Long Transmission Lines Followed by Transformers**
- B5-120 Quantitative Reliability Assessment of Alternative Busbar Protection Schemes**
H AL KHAZIM - *GULF STATES COMMITTEE*
- B5-121 Using of Optimization techniques for development of functionally integrated systems of relay protection and automation**
A.A. VOLOSHIN, A.F. DYAKOV, A.V. ZHUKOV, G.S. NUDELMAN - *RUSSIA*
- B5-122 PMU Based Real Time Vulnerability Assessment of Zone 3 Distance Relay to Prevent Cascading Outages**
T. GHANIZADEH BOLANDI, M-R. HAGHIFAM - *IRAN*

SC B5 PROTECTION AND AUTOMATION

PS2: Coordination of Generator and power system Protection

- B5-201 A Universal Relay Protection Coordination Model for Synchronous Machine Based on Transient Stability**
S. CHEN, M. MUSAVI, P. VILLENEUVE, P. LERLEY - *USA*
- B5-202 Coordination of Power Plant Backup Protection and Transmission System Protection in Thailand**
S CHAIPUNHA, S. LERTPORNPAKDEEWONG - *THAILAND*
- B5-203 Coordination of Generator and Power System Protection in Korea**
J. S. KANG, Y.S LYU, J.J YANG, S.H BYUN, J.H KIM, J.W CHO - *KOREA*
- B5-204 System Protection against Voltage Instability and Impact of Generator Protection**
C. VOURNAS, C. LAMBROU, V. NIKOLAIDIS - *GREECE*
- B5-205 Operating experience with the coordinated requirements for power plant and power system protection**
A. (ANTON) JANSSEN - *NETHERLANDS*
- B5-206 Probabilistic Analysis of Fault currents in Unbalanced Distribution Systems in the Presence of Stochastically Dependent Renewable Energy Re-sources.**
A.F. NAIEM - *EGYPT*
- B5-207 Protection and Operation Requirements to Enhance Grid Stability with Large Scale Wind Integration in Egypt**
MOHAMED ATTIA ELSHARNOBY - *EGYPT*
- B5-208 Performance of generator protection during power system failures – selected protection functions and new experiences with unsymmetrical faults**
H. HERRMANN - *GERMANY*
- B5-209 The Performance Analysis of Protection Schemes in Transmission System with Series Compensated Transmission Lines using a Real Time Digital Simulator (RTDS)**
R BUDHA, F HASHIESH, A TAYLOR, R ZHANG - *UNITED KINGDOM*
- B5-210 Offshore context and protection issues**
J CAZAL - *FRANCE*

- B5-211 Coordinating Generating Units and Power System Protections**
F. BALASIU, GH. MORARU - *ROMANIA*
- B5-212 HV Open Phase Detection Method Based on Symmetrical Components**
U AJMAL - *NEW ZEALAND*
- B5-213 Requirements for relay protection and automation applications of electric power stations, providing stability of their operation in electric power system**
A. ZHUKOV, S. PAVLUSHKO, E. SATSUK, V. VOROBYEV, A. RASSHCHEPLYAEV - *RUSSIA*
- B5-214 High-speed Generator-transformer Unit Backup Protection Scheme**
Y ROMANOV, G. NUDELMAN - *RUSSIA*

SC C1 SYSTEM DEVELOPMENT AND ECONOMICS

PS1: State of the art approaches and standardization in asset management decision making

- C1-101 Transitioning of Distribution Asset Management to a Prescriptive Approach**
D. DORR, J. GREEN, J. ROARK - *USA*
- C1-102 Analysis of SCADA data for early fault detection in Wind turbines**
P. BANGALORE, S. LETZGUS, L. BERTLING TJERNBERG - *SWEDEN*
- C1-103 Development and application of an asset criticality framework to prioritise asset expenditure**
G ANCELL, J BATTSON - *AUSTRALIA*
- C1-104 Changing interaction between asset renewal and planning in Australia and New Zealand**
G ANCELL, H DE BEER, N PUSHPARAJ, G COBLE-NEAL, H KLINGENBERG, E MONTIEL - *AUSTRALIA*
- C1-105 Transmission Asset Management Through in-House Developed Software for Transmission System of Gujarat State**
M.K. JANI - *INDIA*
- C1-106 Hazard Rate Model for Risk-based Asset Investment Decision Making**
G. FORD - *CANADA*
- C1-107 CANCELLED - Condition assessment risk engineering**

SC C1 SYSTEM DEVELOPMENT AND ECONOMICS

PS2: Interface and allocation issues in planning T&D networks with multi-party projects

- C1-201 INVESTMENT ANALYSIS IN TRANSMISSION AND DISTRIBUTION PROJECTS - CALCULATION OF MANAGEMENT FLEXIBILITIES**
V.O. ALBURQUERQUE, M.C. BRANDÃO, J.A.B MONTEVECHI, E.O. PAMPLONA - *BRAZIL*
- C1-202 Assessment of Island Interconnection Projects via HVDC Links of Partial Capacity: The Case of Crete**
S. PAPATHANASSIOU, M. PAPADOPOULOS, S. NANOU - *GREECE*
- C1-203 Transmission Network Planning and Delivery: comparing the German and Chilean Experiences**
J. ARANEDA - *CHILE*
- C1-204 Managing Regional Security of Supply: A Case Study from Scotland**
S GILL, G HAWKER, K BELL - *UNITED KINGDOM*
- C1-205 Djibouti Transmission Master Plan at 2033 horizon**
L. CHARLIER, R. ADEN, J. DUBOIS - *DJIBOUTI*
- C1-206 Research on Power Grid Planning Data Model and Data Stream of State Grid Corporation**
P. HUANG, J. L. FENG, J. R. LI, F.Z. LUO - *CHINA*
- C1-207 Challenges in Realising the Potential of the GCC Interconnector**
M. AL-SHAIKH, V. KVEKVETSIA, R. DRUCE, P. DAVIES - *GULF STATES COMMITTEE*

SC C1 SYSTEM DEVELOPMENT AND ECONOMICS

PS3: New system solutions and planning techniques for flexible and robust system plans

- C1-301 Energizing Green Cities in Southeast Asia: Application of Sustainable Urban Energy and Emissions Planning in Vietnam**
D.R. OSTOJIC, R.K. BOSE - *USA*
- C1-302 Integration of Series FACTS into Interconnect-scale Production Cost and Long-term Planning Tools**
F. KREIKEBAUM, A. WANG, S. BROAD - *USA*
- C1-303 Innovative approach to obtaining authorisation for new power corridors in South Africa**
KEVIN, K LEASK - *SOUTH AFRICA*
- C1-304 Change in selection philosophy of shunt line reactor allows Eskom to realize perpetual economic benefits**
SUMEET, S RAMANDH - *SOUTH AFRICA*
- C1-305 Overcoming barriers to the use of alternative and innovative solutions such as stand-alone power systems as an alternative to replacement of end-of-life network assets**
T FAIRFIELD, O ARTEAGA NOVOA, P HOWE, P NEWITT, J THOMAS - *AUSTRALIA*
- C1-306 Transmission System Planning under uncertainties including renewable penetration regime in Indian Context**
SUBIR SEN, I.S. JHA, Y.K. SEHGAL, K. BHAMBANI - *INDIA*
- C1-307 Probabilistic Power Flow as an element of planning methodology**
W LUBICKI, M PRZYGRDZKI - *POLAND*
- C1-308 Assessment of the Impact on Hybrid AC/DC Power System Following a Change of the Bulk Power System**
A. NAKAJIMA - *JAPAN*
- C1-309 Offshore wind farm stochastic economic evaluation**
MOHAMED ALI - *EGYPT*
- C1-310 Optimization of RES Generation in the European System**
J.L. FERNÁNDEZ, R. PEIRÓ - *SPAIN*
- C1-311 Technical and Economical Evaluation of the Use of Energy Storage to Provide Frequency Regulation Services in the Chilean Interconnected Systems**
A. ALEGRIA - *CHILE*
- C1-312 Complex Modernization of Russian Distribution Network of Bashkirenergo based on advanced Smart Grid Technologies**
H. MUELLER - *GERMANY*
- C1-313 CANCELLED - New Approaches and Solutions for Future System Planning – a System System Planning – a System**
- C1-314 Côte d'Ivoire Generation and Transmission Master Plan at 2030 horizon**
A. TRAORE, L. CHARLIER, S. AHOUSSOU, J. DUBOIS, B. JANSSENS - *IVORY COAST*
- C1-315 e-Highway2050: a research project analysing very long term investment needs for the pan-European transmission system**
G. SANCHIS, T. ANDERSKI, F. CARERI, N. GRISEY, G. MIGLIAVACCA, D. ORLIC - *SC C1*
- C1-316 French Zonal Model for Development Studies**
G PAUL - *FRANCE*
- C1-317 An innovative cost-benefit analysis to assess transmission projects: the Italian case**
E ELIA, V VASCELLARI, P DI CICCO, S IBBA, D CANEVER, B COVA, A VENTURINI, P VICINI - *ITALY*
- C1-318 Application of innovative grid-impacting technologies in pan-European and regional case studies towards the EU Energy Union: the GridTech analyses**
A. L'ABBATE, H. AUER, C. VERGINE, O. D'ADDESE, A. SALLATI, P. TISTI, A. MANSOLDO - *ITALY*
- C1-319 A practical implementation of representative planning case selection for grid studies, as used in TYNDP studies for ENTSO-E**
P. VAN ROY - *BELGIUM*

- C1-320 Research on the Efficient and Secure Transmission of Wind, PV and Thermal Power from Large-scale Energy Resource Bases through UHVDC Projects**
Z.Y. LIU, Q. P. ZHANG, C. DONG, L. ZHANG, Z.D. WANG - *CHINA*
- C1-321 Comparison between Deterministic and Probabilistic Methods for Evaluating Grid-Accommodative Wind Power Capacity**
E.S. DU, N. ZHANG, C.Q. KANG, X.M. JIN, J.H. BAI - *CHINA*
- C1-322 Systematic Approach for Dynamic Equivalents Development of Large-Scale Power System Using PSS/E**
M. M. AL HAJJI, M.A. ABIDO - *GULF STATES COMMITTEE*
- C1-323 Planning and Design Considerations Associated with the Integration of the UAE's First Nuclear Power Plant**
BRUCE STEDALL - *GULF STATES COMMITTEE*
- C1-324 Improvement of mode controllability and short-circuit currents limitation in metropolises power grid by means of electromechanical AC links as an alternative to DC links**
P SOKUR, Y. DEMENTYEV, Y. SHAKARIAN, N. PINCHUK, V. NOVOZHILOV, V. TRETYAKOV, V. DYACHKOV, Y. KUCHEROV, D. YAROSH, A. MAYOROV, A. SHABASH - *RUSSIA*

SC C2 SYSTEM OPERATION AND CONTROL

PS1: Grid operation solutions to changes in generation mix including distributed and renewable generating resources

- C2-101 Using a Static and Dynamic Security Assessment Tool to Evaluate the Effects of Increasing Wind Power Penetration in Future Operating Conditions of the Brazilian Interconnected Power System**
F.R.M ALVES, L.P. ALMEIDA, R.P. FERNANDES, J.A. PASSOS FILHO, F.L. LIRIO, R.M. HENRIQUES, P.O. LA GATTA, S. GOMES JR - *BRAZIL*
- C2-102 Improvement of Technical Requirements for Connecting Wind Plants in the Brazilian Interconnected Power System**
S.L.A SARDINHA, S.J.N CISNEIROS, M.J. BOTELHO, P. GOMES, D.O.C BRASIL, F.C. MEDEIROS, A. BIANCO, A.D.R MEDEIROS, P.E.M QUINTÃO, A.A. BARBOSA, F.R. SOBRAL - *BRAZIL*
- C2-103 High Fidelity Modeling Approach to Analysing Combined-Cycle Power Plant Response to Proposed ROCOF Requirements in Ireland**
S. BARNES, D. LEONARD, M. ALEXANDER, V. TASHJIAN, P. DOYLE, C. D'ARCY - *USA*
- C2-104 Tuning primary frequency controllers using robust control theory in a power system dominated by hydropower**
L. SAARINEN, U. LUNDIN - *SWEDEN*
- C2-105 Full Scale Frequency Response Tests in the Nordic Synchronized Area**
E. AGNEHOLM, M. NILSSON, M. LAASONEN, M. HOEGDAHL ZARNASTIL, A. JANSSON, S. LINDAHL, A. WESTBERG - *SWEDEN*
- C2-106 Integration of PV Contribution into the Load Forecast and Dispatch**
D SHARAFI, R MORRIS - *AUSTRALIA*
- C2-107 Selective Generation Shift Key determination - an enhanced method for the flow-based market coupling capacity calculation**
S. ALMEIDA DE GRAAFF - *NETHERLANDS*
- C2-108 Secondary Frequency Control and Balancing Operation Using Coordination Control of Conventional Sources and Battery Energy Storage System with Large-scale Renewable Energy Integratio**
Y. KANEUCHI - *JAPAN*
- C2-109 Storage application for frequency control of hourly cross-border program changes**
D. (DANNY) KLAAR - *NETHERLANDS*
- C2-110 Innovative tools for the future coordinated and stable operation of the pan-European electricity transmission system**
G.A. MORALES - *NETHERLANDS*
- C2-111 Increased cooperation between TSO and DSOs as precondition for further developments in ancillary services due to increased distributed (renewable) generation**
M. KRANHOLD - *GERMANY*
- C2-112 Primary control reserves provision with battery energy storage systems in the largest European ancillary services cooperation**
M. KOLLER - *SWITZERLAND*

- C2-113 Real time synchronous generator dynamic reactive reserve monitoring by coordinated reactive power voltage controller**
J DRAGOSAVAC, Ž JANDA, D ARNAUTOVIC, T GAJIC, S DOBRICIC, J MILANOVIC, S SUBOTIC, B MIHIC - *SERBIA*
- C2-114 Anticipating Power System Needs in Response to the Global Energy Transition**
E. QUITMANN - *GERMANY*
- C2-115 Emulated Inertial Response from Wind Power: Ancillary Service Design and System Scheduling Considerations**
P DALY - *IRELAND*
- C2-116 Operational Security Challenges and Tools for a Synchronous Power System with High Penetration of Non-conventional Sources**
I. DUDURYCH - *IRELAND*
- C2-117 Smart dispatch of variable-speed Pump Storage Plants to facilitate the insertion of intermittent generation**
A NETO - *FRANCE*
- C2-118 Innovative solutions for real-time Dynamic Security Assessment and automatic system devoted to special protection schemes of Italian Defense plan**
G BRUNO, E CARLINI, R SALVATI, L CAMPISANO, V AGNETTA, P PAU, M STORI, C CANDIA, F ISELLA - *ITALY*
- C2-119 Power Systems Oscillations Damping with Regard the Finite Speed of Propagation the Electromechanical Waves**
O. AGAMALOV - *UKRAINE*
- C2-120 Integration of 2 days-ahead capacity forecast for managing Belgian energy imports**
F. SKIVEE - *BELGIUM*
- C2-121 Monitoring, operation and control solutions in the process of renewable energy source integration Transelectrica's experience**
D. ILISIU, F. BALASIU, D. FIRICA - *ROMANIA*
- C2-122 Probabilistic dimensioning of tertiary control reserve driven by the intermittency of renewable generation in Portugal**
N. PINHO DA SILVA, R. PESTANA - *PORTUGAL*
- C2-123 Stability Control Strategy and Operation of Large-Scale UHVAC/DC Hybrid Power System**
T. XU, M.J. LI, J.B. HE, Z. YU, J.Y. ZHANG, J. YI, X.C. REN, H.T. ZHANG - *CHINA*
- C2-124 New Ancillary Service to Mitigate Deterministic Frequency Deviations**
B.H. BAKKEN - *NORWAY*
- C2-125 Automatic device of monitoring of stability margins**
A. LISITSYN, P. KATS, S. CHAPLUK, M. EDLIN, E. SATSUK - *RUSSIA*

SC C2 SYSTEM OPERATION AND CONTROL

PS2: Managing system disturbances and system restoration

- C2-201 Ensuring the black start capability of the South African Power system**
ALAN NAMBIAR - *SOUTH AFRICA*
- C2-202 Geomagnetic Disturbances Monitoring, Modelling and Mitigation**
S. SAGARELI, M. KOENIG, H. CAMARA, V. PANUCCIO, S. SAMBASIVAN, A. O'MALLEY, Z. QAYYUM, J. TAYLOR, R. LORDAN - *USA*
- C2-203 EXPERIENCES WITH GENERATOR FAILURE AND EFFECT ON NETWORK AND LOAD RESPONSE**
ROBERT, R STEPHEN - *SOUTH AFRICA*
- C2-204 Wide-area control of SVCs in Australian power system**
A VAHIDNIA, G LEDWICH, R MEMISEVIC - *AUSTRALIA*
- C2-205 POORLY DAMPED ELECTROMECHANICAL OSCILLATION IN THE 345 kV INTERCONNECTION BETWEEN ARGENTINA AND CHILE. IDENTIFICATION BASED ON A SLIDING PRONY ANALYSIS.**
J. AGÜERO, R.D. MOLINA, J.C. BARBERO, F. ISSOURIBEHHERE - *ARGENTINA*
- C2-206 Control of wind farm and VSC-HVDC to enhance frequency reserve**
G. JANG, H KIM, K KIM, Y YOO, B KO - *KOREA*

- C2-207 Methodology for next generation system operation between DSO and DSO**
R. SCHWERDFEGER - *GERMANY*
- C2-208 Advances in Wide Area Monitoring and Control to address Emerging Requirements related to Inertia, Stability and Power Transfer in the GB Power System**
D WILSON, S CLARK, S NORRIS, J YU, P MOHAPATRA, C GRANT, P ASHTON, P WALL, V TERZIJA - *UNITED KINGDOM*
- C2-209 Disturbance Management in the Turkish Power System interconnected with the ENTSO-E System. Defence Strategies and Operation Experience**
F. ILICETO - *TURKEY*
- C2-210 Norwegian disturbance management system and database**
G. KJOLLE - *NORWAY*
- C2-211 Power system operation efficiency increasing considering transfer capacity parameters affection**
V. DIYACHKOV, E. REPINA - *RUSSIA*
- C2-212 Operator Training for Restoration of Power Systems with High Shares of Volatile Generation**
W. WELLSSOW - *GERMANY*
- C2-213 An Assessment of a Cost-effective Demand Response Scenario A case study for Jordan**
M. ALNABULSI - *JORDAN*

SC C3 SYSTEM ENVIRONMENTAL PERFORMANCE

PS1: Environmental liabilities of transmission and distribution assets

- C3-101 Analysis of the Impact of Geomagnetic Disturbances on the Austrian Transmission Grid**
T. HALBEDL - *AUSTRIA*
- C3-102 Electrocutation risks to endangered birds on MV overhead lines – South African experiences**
ANDREAS, A BEUTEL - *SOUTH AFRICA*
- C3-103 The authorization procedure for Energy Storage Systems Projects installed on the Italian Transmission Grid**
R VANADIA, M. REBOLINI, S. TOSI, N. DI PIETRO, E. SENATORE, R. POLITO - *ITALY*
- C3-104 Liability for contaminated sites initiated by the unbundling of the transmission grid in Belgium**
V. DUFOUR - *BELGIUM*

SC C3 SYSTEM ENVIRONMENTAL PERFORMANCE

PS2: Overhead lines and underground cables: acceptability issues

- C3-201 Evaluation method for values derived from substation instalment**
R. TAKAHASHI - *JAPAN*
- C3-202 Ausgrid's North Shore 132kV Cables Project - Learnings on Route Selection, EMF Mitigation and Stakeholder Engagement**
J HART, G MELIK - *AUSTRALIA*
- C3-203 HV Underground Cables Magnetic Field Mitigation Measures**
C. WALL, P. ARNERA, B. BARBIERI - *ARGENTINA*
- C3-204 3D multi-viewpoints environment to analyze the visual impact of overhead lines**
F.J. MORENO - *SPAIN*
- C3-205 Analysis of Induced Electromotive Force in Phase Conductors of 35 kV Line Caused by Phase-to-Ground Fault in 400 kV Overhead Power Line**
M. GRBIC, D. SALAMON, A. PAVLOVIC - *SERBIA*
- C3-206 CANCELLED - Visual Impact provision**

- C3-207 On the use of the HMCPL shielding system in renewing the underground HV power lines in big cities**
P RIBALDONE, G. LAVECCHIA, A. CANOVA, L. GIACCONE - *ITALY*
- C3-208 CANCELLED - The citizens and local authorities views on actions taken to enhance public acceptance of a 380kV grid extension project**
- C3-209 Life cycle assessment of the UGC transmission system in Iceland**
H. HROLFSDOTTIR, M. PALSSON, I. HJARTARSON, A. KJELD, G.M. INGOLFSDOTTIR, H.J. BJARNADOTTIR - *ICELAND*
- C3-210 Environmental Impact and Prevention analysis for urban Substations**
J. WANG, W. HUANG, Y. QIANG - *CHINA*
- C3-211 CANCELLED - Implementation of 3D-graphic technology into practical overhead transmission line routing**

SC C3 SYSTEM ENVIRONMENTAL PERFORMANCE

PS3: Climate Change: Implications for Electric Power Systems

- C3-301 Hydropower plants and the Climate Change: Impacts and Actions**
P.K.T NAKAYAMA, A.L. MUSTAFA - *BRAZIL*
- C3-302 Enhancing resilience of the North Indian Power System against pollution and foggy weather - An Experience**
R.K. PORWAL, V.K. AGRAWAL, K.V.S BABA, S.R. NARASIMHAN, N. YADAV, ANKIT GUPTA, S.S. GOYAL - *INDIA*
- C3-303 An approach to dealing with visual impact of existing high voltage transmission lines**
H PEARSON - *UNITED KINGDOM*
- C3-304 Reduction of greenhouse gases in GIS pilot project application in UK**
E LARUELLE - *FRANCE*
- C3-305 Climate Change Impact on Electrical Power System, Case study from Jordanian Electrical System**
M. ALOMARI - *JORDAN*

SC C4 SYSTEM TECHNICAL PERFORMANCE

PS1: Impact of inverter based generation and Energy Storage

- C4-101 Harmonic Distortion Assessment Related to the Connection of Wind Parks to the Brazilian Transmission Grid**
R.P.D ROSS, M.P. CARLI, P.F. RIBEIRO - *BRAZIL*
- C4-102 Transient Stability Impacts of High Levels of RES on the Western US Grid**
N.W. MILLER, M. SHAO, S. PAJIC, R. D'AQUILA, K. CLARK - *USA*
- C4-103 Utility Connected Smart Inverters – Lessons Learned from Demonstration of Open Standards and Protocols**
A. HUQUE, T. KEY, B. SEAL, J. SMITH, H. ASGEIRSSON, C. BURNS - *USA*
- C4-104 Development of improved aggregated load models for power system network planning in the Nordic power system**
E. HILLBERG, S. ACKEBY, R. LEELARUJI, M. BOLLEN, J. SETRÉUS, M. KOSKINEN, J. MATILAINEN, H. KILE, M. GUSTAFSSON - *SWEDEN*
- C4-105 CANCELLED - Voltage stability based assessment of embedded generation carrying capacity in MV and LV distribution feeders**
- C4-106 CANCELLED - The modeling optimization of Lithium ion batteries for the Energy Storage System for use in Frequency Regulation.**
- C4-107 Voltage Swell Mitigation in EHV Real Network Using Flexible AC Transmission Systems Based on Evolutionary Computing Method**
M. A. MOUSTAFA HASSAN - *EGYPT*

- C4-108 Power Quality Monitoring and Assessment in the Spanish Transmission System**
A. DÍAZ, L. SOTO, L.F. BEITES, M. ÁLVAREZ - *SPAIN*
- C4-109 STORE: A Comprehensive Research and Demonstration Project on the Application of Energy Storage Systems in Island Power Systems**
L. ROUCO, I. EGIDO, E. LOBATO, L. SIGRIST, A. BARRADO, P. FONTELA, J. MAGRIÑÁ - *SPAIN*
- C4-110 Power Intensive Energy Storage and Multilevel STATCOM for frequency and voltage grid support**
E. SPAHIC - *GERMANY*
- C4-111 Challenges in harmonic assessments of non-linear load connections**
L KOO, Z EMIN - *UNITED KINGDOM*
- C4-112 Amplification of Harmonic Background Distortion in Wind Power Plants with Long High Voltage Connections**
C.F. JENSEN - *SC C4*
- C4-113 Power Quality and EMC Issues associated with future electricity networks – status report on behalf of CIGRE/CIREN JWG C4.24**
F. ZAVODA, M.H.J. BOLLEN, S.K. RONNBERG, P. CIUFO, R. LANGELLA, G.C. LAZAROIU, J. MEYER - *SC C4*
- C4-114 Investigation of Harmonics Trends and Characteristics on the Irish Transmission System by analysing Historical PQ Measurements and SCADA Records**
B. KELLY - *IRELAND*
- C4-115 LARGE SCALE ITALIAN ENERGY INTENSIVE STORAGE INSTALLATION: SAFETY ISSUES AND ENVIRONMENTAL COMPATIBILITY**
N. DI PIETRO, R. BENATO, S. DAMBONE SESSA, R. POLITO, M. ANDRIOLLO - *ITALY*
- C4-116 Electrochemical Energy Storage Systems and ancillary services: the Italian TSO's experience**
G BRUNO, E.M. CARLINI, S. GIONCO, C. MARTARELLI, L. ORTOLANO, M. PETRINI, L. ZARETTI, R. POLITO - *ITALY*
- C4-117 Impact of Photovoltaic Power Systems Control on Romanian Power Quality as Measured in the Connection Common Points**
D. ILISIU, D. STANESCU, P. POSTOLACHE - *ROMANIA*
- C4-118 Assessing Inverter Based Generation Exposure to Voltage Sags**
A. SANTOS, M.T. CORREIA DE BARROS - *PORTUGAL*
- C4-119 Impact of Connecting Renewable Power Plants on the Dynamic Voltage Response, Voltage Stability and Low Voltage Ride Through (LVRT) Capability**
A. JABERT - *JORDAN*

SC C4 SYSTEM TECHNICAL PERFORMANCE

PS2: Challenges with modeling and evaluation of lightning performance and insulation coordination in the power system of the future

- C4-201 Application of the Leader Progression Model to evaluate the lightning performance of AC and DC EHV transmission lines**
P.M. MIGUEL, D.M. CORREIA, A.C. CARVALHO - *BRAZIL*
- C4-202 Overview of statistical data on lightning outages of transmission lines in Japan**
M. MIKI - *JAPAN*
- C4-203 Economic Assessment of Lightning Performance Improvement of 69 kV Overhead Subtransmission Line on Monopole and Concrete Pole in MEA's Power Distribution System**
A PHAYOMHOM - *THAILAND*
- C4-204 A CASE STUDY AND OBSERVATION ON CAUSE OF TRANSMISSION LINE OUTAGES IN MALAYSIA**
I MOHAMED RAWI, M AB KADIR - *MALAYSIA*
- C4-205 Assessment of Lightning Shielding Performance of a 400 kV Double-Circuit Fully Composite Pylon**
T. JAHANGIRI, CLAUS LETH BAK, FILIP FARIA DA SILVA, B. ENDAHL, J. HOLBØLL - *DENMARK*
- C4-206 CANCELLED - Numerical investigations of transient voltages in high voltage networks related to Insulation Coordination**

- C4-207 Analysis of opportunities to improve the HVDC SwePol Link operation due to commutation failures**
M PRZYGRÓDZKI, M SZABLICKI, P RZEPKA - *POLAND*
- C4-208 Investigating the Methodology and Implications of Implementing Long HVAC Cables in the Ireland and Northern Ireland Power System**
N. CUNNIFFE - *IRELAND*
- C4-209 Isolated systems interconnected via HV submarine XLPE cables**
G TREMOUILLE - *FRANCE*
- C4-210 Switching transients on very long HV ac cable lines: simulations and measurements on the 230 kV Malta-Sicily Interconnector**
F PALONE, M. REBOLINI, S. LAURIA, M. MACCIONI, M SCHEMBARI, J.P. VASSALLO - *ITALY*
- C4-211 ELECTRICAL PERFORMANCE OF 10kV POLYMER INSULATOR UNDER LIGHTNING INDUCED VOLTAGE CONDITION**
M.Z.A. AB-KADIR - *MALAYSIA*
- C4-212 EFFECT OF PARALLEL 275kV TRANSMISSION LINE WITH OIL PIPELINE ON ELECTROMAGNETIC FIELD CALCULATION**
M.Z.A. AB-KADIR - *MALAYSIA*
- C4-213 Measurement Techniques on Transient Process of Lightning Striking Overhead Transmission Lines**
S.J. XIE, J.M. LI, R. ZENG, Y. ZHANG, C. J. ZHUANG, H. WANG - *CHINA*

SC C4 SYSTEM TECHNICAL PERFORMANCE

PS3: Bridging the gap between EMT , FEM and positive sequence grid simulation

- C4-301 Simulating Single-Pole Opening Using a Detailed Protection Model and a Transient Stability Program**
D.M. MACGREGOR, C. ZHENG, S.G. AQUILES-PEREZ, N.D. ORREGO-PALACIO - *USA*
- C4-302 Development of surge simulation techniques based on the finite difference time domain method and its application to surge analysis**
A. TATEMATSU - *JAPAN*
- C4-303 Defining - and Computing the Margin in Critical Clearing Time: Eskom experience**
FRANCO, LNF DE VILLIERS - *SOUTH AFRICA*
- C4-304 "Shunt Compensation, Reliability Analysis and Condition Monitoring System measurements and simulations for an EHV mixed Overhead line - Cable connection**
H. KHALILNEZHAD - *NETHERLANDS*
- C4-305 HVDC system modeling coherence between EMT and phasor domain tools**
S DENNETIERE - *FRANCE*
- C4-306 SOME MEANINGFUL EXAMPLES OF SEQUENCE THEORY USE LIMITATION**
R BENATO, S DAMBONE SESSA - *ITALY*

SC C5 ELECTRICITY MARKETS AND REGULATION

PS1: Interactions between wholesale and retail markets; the future of regulation

- C5-101 Aligning Regulatory Incentives and Price Signals in the Brazilian Wholesale and Retail Electricity Markets**
X. VIEIRA FO., R. HOCHSTETLER, J.C. MELLO, L.A. BARROSO - *BRAZIL*
- C5-102 Market design of one hour ahead and real time market and implementation of cross-regional network operation in Japan**
H. ASANO - *JAPAN*
- C5-103 CANCELLED - Is the regulatory regime of liberalised electricity markets appropriate for the future?**
- C5-104 A methodology for the analysis of market design at the horizon 2030**
E CERQUIERA, A DALLAGI, R BELHOMME, M TROTIGNON, R JOVER, L GLORIEUX - *UNITED KINGDOM*

C5-105 New approach to congestion management for decentralized market coupling using net export curves
I.V. BLINOV - *UKRAINE*

SC C5 ELECTRICITY MARKETS AND REGULATION

PS2: Market models and regulatory structures in an evolving industry situation

- C5-201 Practices for Risk Assessment and Control in the Brazilian Electricity Market: state of the art**
P. HANSEN, R. CABRAL, H. LEME, L.F.S ROSA, R. SACCHI, D. MACIEL, L. BARROSO - *BRAZIL*
- C5-202 Market coupling, facing a glorious past?**
R HIRVONEN - *FINLAND*
- C5-203 The Importance of a Performance-Based Capacity Market to Ensure Reliability as the Grid Adapts to a Renewable Energy Future**
G. VAN WELIE, R.G. ETHIER - *USA*
- C5-204 HVDC Transmission Scheme for Sustainable Energy Supply**
YING JIANG-HÄFNER, P. LUNDBERG - *SWEDEN*
- C5-205 Impacts of asset investment of renewable energy on market design and operation**
K. OGIMOTO - *JAPAN*
- C5-206 Renewable Energy Policy and Barriers under Fluctuation of Energy Price and Economic Growth in Thailand**
K. PANPUEK - *THAILAND*
- C5-207 Introduction of Sub-Hourly Market in Power Exchanges and Facilitating Large Scale Renewable Energy Integration in India**
S.K. SOONEE, V.K. AGRAWAL, S.S. BARPANDA, S.C. SAXENA, K. DEY, K.V.N PAWAN KUMAR - *INDIA*
- C5-208 CANCELLED - Preparation for implementation of a Capacity Mechanisms based on the cost based pool in the Korea electricity market**
- C5-209 REGULATORY STRUCTURE AND MARKET MODEL IN MALAYSIA WITH THE IMPLEMENTATION OF INCENTIVE BASED REGULATIONS (IBR) AND NEW ENHANCED DISPATCH ARRANGEMENT (NEDA)**
W WAN SYAKIRAH - *MALAYSIA*
- C5-210 Mexico 's Wholesale New Power Market**
M.A. AVILA-ROSALES - *MEXICO*
- C5-211 Restructuring System Services for the Highest Levels of Wind Integration**
J O'SULLIVAN - *IRELAND*
- C5-212 Capacity Markets and the EU Target Model – a Great Britain Case Study**
G HAWKER, K BELL, S GILL - *UNITED KINGDOM*
- C5-213 Capacity Mechanisms: Results from a World Wide Survey**
H. HÖSCHLE ON BEHALF OF CIGRE WG C5.17, G. DOORMAN - *SC C5*
- C5-214 Flow-based market coupling in the Central Western European region: Welcome to the market coupling 2.0**
D GARREC - *FRANCE*
- C5-215 Techno-economic analysis and simulations of the transmission and distributions systems interactions in different regulatory frameworks**
G. PETRETTO, M. CANTU', G. GIGLIUCCI, N. NATALE, F. PILO, G. PISANO, G.G. SOMMA, M. COPPO, R. TURRI - *ITALY*
- C5-216 Implementation of a Strategic Reserve in Belgium: Product Design and Market Results**
H. HOSCHLE - *BELGIUM*
- C5-217 Study on Key Issues of Direct Trading between Power Users and Plants**
X. ZHANG, B. PANG, L.J. SHI, J. GENG, Y. X. ZHENG - *CHINA*

C5-218 Capacity market. Change of the model shifting from deficit to excess

A. KATAYEV, F. OPADCHIY - *RUSSIA*

C5-219 Evaluating Regulatory Framework in Iran's Electricity Sector: A Benchmarking Analysis

M. MOHAMMADI, S. RAMYAR, M.P. ARABANI - *IRAN*

SC C5 ELECTRICITY MARKETS AND REGULATION

PS3: Distributed resource and demand response integration from the perspective of electricity market structures

C5-301 EVALUATION OF DEMAND SIDE MANAGEMENT MECHANISMS AND OPPORTUNITIES FOR THEIR DEVELOPMENT IN THE BRAZILIAN POWER INDUSTRY

C. DORNELLAS, E. NEVES, L. BARROSO, J. MELLO, J.W.M LIMA, J. DUTRA, A. PIMENTA, H. SOUSA - *BRAZIL*

C5-302 Experiences and Lessons Learned based on Distributed Generator of EGCO in Thailand Power Grid

W SINSUKTHAVORN, G BUMROONGGIT, S POCHANART - *THAILAND*

C5-303 Market Access for Renewables in the German Power Market and Market Design Challenges

P. GIESBERTZ - *NETHERLANDS*

C5-304 Comparison of market designs enabling DSR participation in the energy market

B GUÉDOU - *FRANCE*

C5-305 The impact of active demand on the electrical system and its actors estimated within the ADVANCED project

M. LOMBARDI, S. DI CARLO, S. DE FRANCISCI, S. BRAMBILLA, O. FRANZ, P. FRIAS, M. VALLES, M. SEBASTIAN VIANA - *ITALY*

C5-306 Project SMART – lessons learned from the emergency DSR programmes involving residential consumers and the aggregator

M KRUPA, M SOBCZAK, K KULA - *POLAND*

C5-307 DSO-TSO Interactions in Flexibility Contracting

A. RAMOS - *BELGIUM*

C5-308 The importance of market regulation in exploiting demand response on balancing market: Slovenian and Austrian case

D. PARAVAN - *SLOVENIA*

SC C6 DISTRIBUTION SYSTEMS AND DISPERSED GENERATION

PS1: Integrated planning and operation for up grading distribution networks

C6-101 THE GROWTH OF DISTRIBUTED GENERATION IN BRAZIL: IMPACTS, OPPORTUNITIES AND DIFFICULTIES FOUND

P.H.R GAMA, A.R. AOKI, A.R. DONADON, F.S. RETORTA, E. VICENTINI, E. SILVA, L.H.M LEITE, M.E.M SOUZA, M. LOURENÇO - *BRAZIL*

C6-102 Messaging for Enterprise Distributed Energy Resources

J.J. SIMMINS, B.K. SEAL, G.R. GRAY, R.J. SARFI - *USA*

C6-103 Learning from a 3.275 MW Utility Scale PV Plant Project

T SAHA, M ALAM, R YAN, A CHIDURALA, D EGHBAL - *AUSTRALIA*

C6-104 Dynamic distribution system planning considering distributed generation and uncertainties

D FRANCO, A VARGAS, M SAMPER - *ARGENTINA*

C6-105 A Probabilistic Monte-Carlo Simulation to Assess Distribution Network Reliability

M. GAHA - *CANADA*

C6-106 Advanced Self-Healing for Wide Area Power Outage and Network Reconfiguration for Feeder Uploading

B. N. HA, N. H. CHO, S. W. LEE, I. H. LIM - *KOREA*

C6-107 Impact of Distributed Energy Resources and Normally Open Switches on the Operational Performance of Low Voltage Distribution Networks

E.N. DIALYNAS, L.G. DAOUTIS - *GREECE*

C6-108 An Adaptive Protection Infrastructure for Modern Distribution Grids with Distributed Generation

G. KORRES, V. PAPASPILIOPOULOS, N. HATZIARGYRIOU - *GREECE*

- C6-109 Protection coordination for distribution systems containing distributed generating units**
AHMED KAMEL - *EGYPT*
- C6-110 State estimation in MV distribution networks: experience in the Spanish smart grid project PRICE-GDI**
R. GONZÁLEZ, M. BOCOS, J. M^a MAZA, E. ROMERO, I. DÍAZ, A. GASTALVER - *SPAIN*
- C6-111 Linear State Estimation in Low Voltage Grids Based on Smart Meter Data**
W. WELLSSOW - *GERMANY*
- C6-112 Intelligent control of on-load tap changer based on voltage stability margin estimation using local measurements**
H. FENG - *GERMANY*
- C6-113 South East Europe Distribution System Operators Benchmarking Study**
G. MAJSTROVIC, T. BARICEVIC, M. SKOK, W. POLEN, A. DOUB, G. STRMECKI - *CROATIA*
- C6-114 Key findings of a study into the development of future GB systems integrating low carbon technologies and smart solutions**
J KING, G WILLIAMSON, V LEVI - *UNITED KINGDOM*
- C6-115 Impact of distributed generation on load shedding scheme in France: current status and perspectives**
J OTTAVI - *FRANCE*
- C6-116 Technical-economic optimum development plan of the Distribution Network of Abidjan**
S. AHOUSSOU, S. LEYDER, A. TRAORE, S. RAPOPORT - *IVORY COAST*
- C6-117 Prosumers' Battery Electrical Storage Systems: new ancillary services, impact on network planning and operation**
F. CAZZATO, M. DI CLERICO, L. COCCHI, C. NOCE, C. PEZZATO, G. CANEPONI, V. BUFANO - *ITALY*
- C6-118 Real field testing results of the innovative Medium Voltage control system developed in the Italian Demonstrator of GRID4EU**
D. STEIN, L. CONSIGLIO, G. VIGANO', C. MICHELANGELI, C. CARLINI, D. MONETA - *ITALY*
- C6-119 Linear Optimization for Active Distribution Systems Operation Considering Demand Response Mismatch**
Y. WANG, Q.X. CHEN, C.Q. KANG, J.Q. MIAO, J.H. BAI, M. MIAO - *CHINA*

SC C6 DISTRIBUTION SYSTEMS AND DISPERSED GENERATION

PS2: Energy infrastructure for urban networks

- C6-201 Local Adaptive Control of Solar Photovoltaics and Electric Water Heaters for Real-time Grid Support**
B. BHATTARAI, IKER DIAZ DE CERIO MENDAIZA, B. BAK-JENSEN, J. RADHAKRISHNA PILLAI - *DENMARK*
- C6-202 Towards Holistic Power Distribution System Validation and Testing – An Overview and Discussion of Different Possibilities**
T. STRASSER - *AUSTRIA*
- C6-203 Optimized and Enhanced Grid Architecture for Electric Vehicles in Europe**
S. UEBERMASSER - *AUSTRIA*
- C6-204 Leveraging Smart Grids Assets for Building Smart Cities at Marginal Cost**
REJI KUMAR PILLAI, S.A. KHAPARDE - *INDIA*
- C6-205 Advancing the method of estimating the distribution system condition by utilizing smart meters**
M. INAI - *JAPAN*
- C6-206 Beyond Smart Meters: Management of the LV network**
J. GARCÍA, A. GONZÁLEZ, A. ARZUAGA, C. MARTÍNEZ, L. MARRON, M. PINTADO, S. RIAÑO - *SPAIN*
- C6-207 CANCELLED - Navigating the complex world of Energy supply and demand**
- C6-208 Planning studies for active distribution grids in presence of EVs charging stations: simulation on areal test network**
M. DI CLERICO, G. CANEPONI, F. CAZZATO, S. COCHI, M.C. FALVO, M. MANGANELLI - *ITALY*

C6-209 The Integrated Model for Marketing and Distribution Information - Integration Architecture, Implementation and Validation

L. GE, L.Y. PENG, H.B. ZHONG, T. F. KANG, F.Q. ZHAO, M. J. QI, H. LENG - *CHINA*

C6-210 Demonstrations of Communication Standards for Automated Demand Response and Smart Grid

J. YOSHINAGA - *JAPAN*

SC C6 DISTRIBUTION SYSTEMS AND DISPERSED GENERATION

PS3: Microgrids and offgrid hybrid systems

C6-301 NY Prize Community Grid Competition

S. VENKATARAMAN, E. LAROSE, M. RAZANOUSKY, J. SAINTCROSS, M. KOTCH - *USA*

C6-302 Fast Demand Response as an Enabling Technology for High Renewable Energy Penetration in Isolated Power Systems

M NEGNEVITSKY, D NIKOLIC, M DE GROOT, S GAMBLE, J FORBES, M ROSS - *AUSTRALIA*

C6-303 No Load Diesel Application to Maximise Renewable Energy Penetration in Offgrid Hybrid Systems

M NEGNEVITSKY, J HAMILTON, A TAVAKOLI, X WANG, S GAMBLE - *AUSTRALIA*

C6-304 Business Cases for Isolated and Grid-connected Microgrids – Methodology and Applications

G. JOOS - *CANADA*

C6-305 Decision and Management to Interconnect Distributed Energy Resources into Distribution Networks

H.K KANG, S. S. CHO, B.N HA - *KOREA*

C6-306 Smart Region – Automation of Distribution System

ZDENEK MÜLLER - *CZECH & SLOVAK Reps.*

C6-307 Battery Energy Storage Control Strategies for Deterministic and Stochastic Power Profiles

A. OUDALOV - *SWITZERLAND*

C6-308 Smart grids for rural conditions and e-mobility - Applying power routers, batteries and virtual power plants

V. BUEHNER - *GERMANY*

C6-309 Probabilistic Planning of Multi-Microgrids with Optimal Hybrid Multi-Generation sets

E. GHIANI, G. CELLI, S. MOCCI, G.G: SOMA, C. VERTUCCIO, F. PILO - *ITALY*

C6-310 The Hybrid Energy Storage System based on lithium-ion batteries and supercapacitors

A.N. NOVIKOV, A.Z. ZHUK, K.K. DENSCHIKOV, N.L. NOVIKOV, T.YU, ZHORAEV, YU.N. KUCHEROV, E.A. BUZOVEROV - *RUSSIA*

SC D1 MATERIALS AND EMERGING TEST TECHNIQUES

PS1: Compact Insulation Systems (AC and DC)

D1-101 Solid-gas insulation in HVDC gas-insulated system: Measurement, modeling and experimental validation for reliable operation

R. GREMAUD - *SWITZERLAND*

D1-102 Interest of simulations to assess tests to be performed on DC GIS

A GIRODET - *FRANCE*

D1-103 Various Characteristics of GIS Insulation Systems and Test Method of Insulating Spacers for Residual DC Voltage

S. OKABE - *JAPAN*

D1-104 Evaluation of small scale testing for high field conductivity of HVDC cable materials

C. ANDERSSON, V. ENGLUND, H. GHORBANI, C.-O. OLSSON - *SWEDEN*

D1-105 LONG TERM PERFORMANCE OF XLPE INSULATION MATERIALS FOR HVDC CABLES

P.-O. HAGSTRAND, J. ANDERSSON, V. ENGLUND, V. ERIKSSON, J. JUNGKVIST, A. KONTRO, W. LOYENS, U. H. NILSSON, A. SMEDBERG - *SWEDEN*

D1-106 Study of dielectric properties of XLPE for HVDC cables during long-term ageing

A HASCOAT - *FRANCE*

- D1-107 ZnO stress grading tape for stator windings for electrical machines located at higher altitudes**
L. DONZEL - *SWITZERLAND*
- D1-108 DIELECTRIC PERFORMANCE BY ELECTRODE SURFACE PRETREATMENT AND MULTI-LAYER COATINGS IN GIS**
J. H. SON, J. Y. SHIM, D. J. PARK - *KOREA*
- D1-109 Tracking and Erosion Tests for SR Composite Insulators under DC Voltage**
X.D. LIANG, S.H. LI, Y. CHEN, Y. YIN, Z.Y. LI - *CHINA*
- D1-110 Long-term performance of composite station insulators with larger diameters: laboratory tracking and erosion test vs. service experience**
I. GUTMAN, M. GULLO, M. GÅRDESTEDT, J.F. GOFFINET, J. SEIFERT, F. SCHMUCK - *SWEDEN*
- D1-111 The Effect of Bird Streamers on the Insulation Strength of HVDC Lines**
NISHAL, N MAHATHO - *SOUTH AFRICA*
- D1-112 Performance of polymeric insulators in hybrid AC/DC overhead lines under polluted conditions**
A. WAGNER - *GERMANY*
- D1-113 GCCIA POLLUTION TEST STATION: An Optimizing Tool for Pollution Site Severity & Selection of Optimum Insulators Profile In Eastern KSA**
AHMED AL-THAGAFI - *GULF STATES COMMITTEE*

SC D1 MATERIALS AND EMERGING TEST TECHNIQUES

PS2: New materials

- D1-201 Electrical and thermal behaviour of synthetic transformer liquids**
Q LIU, Z WANG, P JARMAN, G WILSON, R HOOTON, D WALKER, P DYER, CH KRAUSE, PWR SMITH, A GYORE, R MARTIN, P MAVROMMATIS, J NOAKHES - *UNITED KINGDOM*
- D1-202 Preliminary study for use of vegetable esters in big power transformers**
F SCATIGGIO, M. REBOLINI, C. SERAFINO, A. VALANT - *ITALY*
- D1-203 Molecular Simulation and Experiment of Transformer Cellulose Insulation Paper Modified by Nano Al₂O₃**
C. TANG, S. ZHANG, Q. ZHOU, X. LI - *CHINA*
- D1-204 CHARACTERISTICS OF FLUORONITRILE/CO₂ MIXTURE - AN ALTERNATIVE TO SF₆**
K. POHLINK - *SWITZERLAND*
- D1-205 Validation method and comparison of SF₆ alternative gases**
C PREVE - *FRANCE*
- D1-206 Thermoplastics for LV Switchgear Application**
BEEMA THANGARAJAN R, S.H. CHETWANI - *INDIA*
- D1-207 Preparation of Thermal Conductive Insulating Composite Material Using Electrostatic Adsorption Method**
Y. MURAKAMI - *JAPAN*
- D1-208 Comparative Investigation on Ester Insulating Liquids for High Voltage Applications**
I. HOEHLEIN-ATANASOVA - *GERMANY*

SC D1 MATERIALS AND EMERGING TEST TECHNIQUES

PS3: Non-standardised stresses and emerging test techniques

- D1-301 Developments for Frequency Response Analysis Automation**
D TUSEK, J WELSH, S WOLINSKI - *AUSTRALIA*
- D1-302 Diagnostic control of oil-paper insulation based on method of "direct" measurement of paper moisture content**
L.A. DARIAN, A.A. KOZLOV, A.V. KOZLOV, V.P. POLISTCHOOK, A.V. SHURUPOV, N.A. MATVEEV - *RUSSIA*
- D1-303 Development of a new spectrophotometric method for analysis of 2-furfuraldehyde in transformer oil as an indicator of paper degradation**
J. JIMÉNEZ, B. REMARTÍNEZ - *SPAIN*

- D1-304 Dissolved Gas Analysis Applied to on Load Tap-Changers**
C.D. SESSA, A.C.P MARTINS, L.M.M CHAVES, D.J. VASSALO, M.J. PROENÇA - *BRAZIL*
- D1-305 A study of liquid-immersed transformer reference insulation systems used to determine thermal class**
H.M. WILHELM, L. LANGER, G. DAL PONT, P.O. FERNANDES, L.G. FEITOSA, R.P. MAREK, L. GALHARDO, E. WANG - *BRAZIL*
- D1-306 A development of DC PD pattern recognition method using Modified CAPD together with PD founding for Gas insulated apparatus under DC voltage**
I. J. SEO, Y. J. LEE, W CHOI, B. W. LEE, J. Y. KOO, J.T KIM - *KOREA*
- D1-307 Signal processing and study of the ripple influence in PD patterns for measurements under HVDC stress**
M.A. SÁNCHEZ-URÁN, F. GARNACHO, F. ÁLVAREZ, G. DONOSO, J. ORTEGO - *SPAIN*
- D1-308 A Review of Dielectric Strength with Distorted Lightning Impulses**
R. DÍAZ, J.N. SILVA - *ARGENTINA*
- D1-309 Insulation Evaluation of High-voltage Insulation Systems for Actual Overvoltage Waveforms and Practical Field Conditions**
S. OKABE - *JAPAN*
- D1-310 Correcting the Errors of Large Impulse Ultra High Voltage Dividers with the Deconvolution Method**
Y LI - *AUSTRALIA*
- D1-311 Investigation of mechanical strength for station post composite insulators subjected to variable loads**
J WANKOWICZ, J BIELECKI - *POLAND*

SC D2 INFORMATION SYSTEMS AND TELECOMMUNICATION

PS1: New applications to control power systems

- D2-101 Smart: Intelligent and integrated platform for power operation centers**
E. ROCHA N., R. ALMEIDA, L. VENTURA, A.S. ARAUJO, D. SANTOS, J.P. SAUVE, N. MELO - *BRAZIL*
- D2-102 Implementation of PMU-Based Linear State Estimation into Energy Management Systems**
A. BOSE, A. JAMPALA, L. ZHANG, V. MADANI, J. GIRI - *USA*
- D2-103 Leveraging Big Data and Modern Communication Protocols to Facilitate New Applications in Power Transmission and Distribution**
S. RAVISH, R. PIACENTINI, Q. GUO - *USA*
- D2-104 Implementation of Information and Telecommunication Systems with the aim of Realization of Smart Grid in Japan**
N. SONE - *JAPAN*
- D2-105 Communications Infrastructure for Future Centralized Substation Protection and Control Systems**
Y. LUSKIND - *CANADA*
- D2-106 Implementation of Online Power System Network Analysis for the EMS in Korean Electric Power Control Center**
H.J KIM, Y.I KIM, C.S SONG, M.H LEE, B.S KIM, Y.H SHIN, Y.S CHO, G JANG - *KOREA*
- D2-107 Results of applying a semantic interoperability strategy in Smart Grid applications for DSO in Mexico**
A. ESPINOSA, S. GONZALEZ, H.R. AGUILAR - *MEXICO*
- D2-108 Classification of customers based on temporal load profile patterns**
I. BENÍTEZ, A. QUIJANO, I. DELGADO, J.L. DÍEZ - *SPAIN*
- D2-109 COCO: Operational control of construction**
A. CADENAS, A. SÁNCHEZ, S. SÁNCHEZ - *SPAIN*
- D2-110 Adding New Functions to the Energy Control System for Operating More Than a Decade in Taiwan**
J.D. LEE - *TAIWAN*
- D2-111 Portable WAMS – a Paradigm Shift**
D. BRNOBIC - *CROATIA*

- D2-112 Experiences from Intelligent Alarm Processing and Decision Support Tools in Smart Grid Transmission Control Centers**
N. BARANOVIC, P. ANDERSSON, I. IVANKOVIC, K. ZUBRINIC-KOSTOVIC, D. PEHARDA, J.E. LARSSON - *CROATIA*
- D2-113 Distributed control architecture for effective Distributed Energy Resources Management**
G FOGGIA - *FRANCE*
- D2-114 CANCELLED - Leveraging big data analytics for customer engagement: the online and mobile solution adopted within the ENEL Info+project**
- D2-115 Optimizing the Network and the Asset Lifecycle and Reduce Operational and Capital Costs through Predictive Analytics and Asset Health Management**
J. BUJAK, S. HAGNER - *SWEDEN*
- D2-116 Study and Practice of General State Estimation and Load Flow Hybrid Method for Modern Power Systems Control Centers**
Y.Q. YAN, Y.Z. XIN, H.Z. TAO - *CHINA*

SC D2 INFORMATION SYSTEMS AND TELECOMMUNICATION

PS2: EPU response to evolving cyber security landscape

- D2-201 Network Architecture and Cyber Security – Two Faces of the Same Coin**
R FERNANDEZ - *AUSTRALIA*
- D2-202 Cyber Security Architecture for Operational Technologies (ICS/SCADA)**
L. (LHOUSSAIN) LHASSANI - *NETHERLANDS*
- D2-203 Application and Management of Cybersecurity Measures for Protection and Control**
D.K. HOLSTEIN, T.W. CEASE, M.G. SEEWALD - *USA*
- D2-204 Application of Monitoring Standards for enhancing Smart Grids Security**
G DONDOSSOLA, R TERRUGGIA, P. WYLACH, G. PUGNI, F. BELLIO - *ITALY*
- D2-205 Fuzzy Rule Based Expert System for SCADA Cyber Security**
D. MLAKIC, L. MAJDANDZIC - *BOSNIA HERZEGOVINA*

SC D2 INFORMATION SYSTEMS AND TELECOMMUNICATION

PS3: Mobile operational applications, systems and infrastructure

- D2-301 Wireless and Mobile Systems for Electric Power System Operation in Japan**
S. MICHIWAKI - *JAPAN*
- D2-302 Ensuring Uptime of WAMS Network with the Help of Common IT Tools – Case Studies**
P.K. AGARWAL, H.K RATHOUR, P. MAURYA - *INDIA*
- D2-303 Communication Networks for Indian Smart Grids**
N.S. SODHA - *INDIA*
- D2-304 Usefulness of AMI data communication systems to the development of Polish DSO smart MV and LV grids with regard to SCADA control systems**
A BABS, J SWIDERSKI, M TARASIUK - *POLAND*
- D2-305 MAGIC – A Microgrid AGent Intelligent Control Device**
N. HATZIARGYRIOU, A. DIMEAS, I. VLACHOS, I. KOUVELIOTIS-LYSIKATOS, D. KOUKOULA, S. MAKRYNIKAS, M. KOUVELETSOU - *GREECE*
- D2-306 PLC MV telecommunications: An evolution path for sustainable private telecom networks enabling smart grid applications**
T. ARZUAGA, D. GIL, J.A. MORENO, A. ARZUAGA - *SPAIN*
- D2-307 IT and OT integration to improve outage management**
M WILLSON, M CANTABRANA - *UNITED KINGDOM*

D2-308 Study on Evolution of Communication Infrastructure for Smart Grid Operation and Management

B.Y. HUANG, X. M. BAI, Q. S. CUI - *CHINA*

D2-309 MPLS-TP AS PACKET PLATFORM FOR CRITICAL SERVICES IN POWER TRANSMISSION

J. RAMIREZ, H. CABRERA, O. BAUTISTA - *VENEZUELA*

D2-310 Communication network toward the realization of a new power distribution automatic control system

H. DOI, K. SHIMOOSAKO, T. ITO, H. NAKAGAWA - *JAPAN*