2021 CENTENNIAL SESSION
TECHNICAL PROGRAMME

SC A1 ROTATING ELECTRICAL MACHINES
PS1: GENERATION MIX OF THE FUTURE

A1-101 Is reliance on synchronous machines holding us back from evolving the power grid to facilitate renewables?
D. VAUGHAN - AU

A1-102 The benefits of implementing Synchronous Compensators in Grids with high penetration of renewables
H. BIELLMANN - FR

SC A1 ROTATING ELECTRICAL MACHINES
PS2: ASSET MANAGEMENT OF ELECTRICAL MACHINES

A1-201 Experimental Study of Vibration Sparking Erosion on Stator Bars
H. ZHU - US, Y. MENG - CN

A1-202 Diagnosis and Prognosis of Wind Turbines using Machine Learning Algorithms on SCADA and Gearbox Vibration Datasets
F. FREITAS - BR

A1-203 Evaluation of the Behavior of Partial Discharges in Generator Heating and Operating Range Tests
P. VILHENA - BR

A1-204 Developments in maintenance processes increase operational availability and contribute to the operating efficiency of the hydroelectric plant of Itaipu.
M. MAURO - BR

A1-205 Partial discharge characterization of stator windings taken from a hydro generator after 50 years of service
E. EBERG - NO

A1-206 Features of the design and operating modes of the asynchronized turbogenerator T3FSU-320
M. ROYTGARTS - RU

A1-207 A Study on the Resonance problems and Anti-Vibration Design of Large Vertical Motor-Pump sets

A1-208 Motor Maintenance Management for Power Plant Operation Reliability with Work Optimization by On-Line Condition Based Monitoring
C. SUPHATTANA - TH

A1-209 PD Measurement Of Rotating Machine For Condition Monitoring
SANJAY KUMAR PRASAD - IN

A1-210 Optimization of turbogenerator’s core suspension system reconstruction methods for life time extension in the power plant conditions.
D. KUZNETSOV - RU

A1-211 A study of the drop test to detect damper faults and sensitivity analysis in order to identify the parameters that have an impact on the test results
K.L. ZAPPPELLINI - FR

A1-212 Potential of VLF PD measurements for diagnosis of stator insulation of large hydro generators
T. BRUEGGER - CH
**SC A1 ROTATING ELECTRICAL MACHINES**

**PS3: LATEST DEVELOPMENTS**

T. HILDINGER - BR

A1-302  Static Eccentricity Fault Detection Method for Electrical Rotating Machines Based on The Magnetic Field Analysis in the Air Gap by Measuring Coils  
S. TVORIC - HR

A1-303  Magnetic Balancing System for Synchronous Machines – A Full Scale Demonstration of Unbalanced Pull Mitigation  
F EVESTEDT - SE

A1-304  Technical challenges and solutions for the new Terna's standardized synchronous condensers/flywheel systems  
M. REBOLINI - IT, L. BUONO - IT, G. GEMELLI - IT, F. PALONE - IT, F.M. PEPE - IT, A. VALANT - IT, A. OLDRATI - IT, M. RACITI - IT, M. SCHENONE - IT, G. ROVETA - IT, A. STIGER - SE, L. CALLEGARI - IT, L. NEGRI - IT

A1-305  How To Choose Electric Drive According IEC 60034-1?  

A1-306  Considerations on IEEE 1310-2012, Numbers of Start-Stops and Life Time of Stator Windings in Hydro-Generators  


A1-308  Development of Reliable Stator Coil End Design of Large Turbine Generator  
S. MURAMATSU - JP

A1-309  Impact of the q-axis sub-transient reactance on the rotor oscillations of a hydro generator  
L. ROUCO - ES, F. PERÁN - ES

A1-310  The Design and Application of New Fast-response, Large-scaled Rotary Condensers in UHV Power Grid  
Y. JIN - CN, J. ZHANG - CN, Z. YU - CN, J. HE - CN

J. ZHANG - CN

A1-312  Failures of Large Turbo-Generators on Prolonged Site Storage - Case Studies of Indian Power Utility  
HIRDESH GUPTA - IN

**SC A2 POWER TRANSFORMERS AND REACTORS**

**PS1: TRANSFORMER TECHNOLOGIES TO ENABLE INTEGRATION OF DISTRIBUTED RENEWABLE ENERGY RESOURCES**

A2-101  Distributed Energy Resources (DERs): Impact of Reverse Power Flow on Transformer  
P. UPADHYAY - US, J. KERN - US, V. VADLAMANI - US

A2-102  Active power control with 400/130 kV transformers. Experience from two recent projects  
P NORBERG - SE

A2-103  Dynamic thermal behaviour of wind power transformers  
T LANERYD - SE
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<td>Effects of TVR application on various voltage changes caused by reverse power flow, distributed power supply and renewable energy</td>
<td>M. Kakihara - JP</td>
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<td>Study on key technology and demonstration application of UHV AC controlled shunt reactor</td>
<td>X. Wang - CN</td>
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<td>System for on-line evaluation of power transformer dynamic thermal capability</td>
<td>Tim Gradnik - SI</td>
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<td>E. Virtanen - FI, T. Laneryd - SE, H. Lendenmann - SE, H. Nordman - FI</td>
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<td>Influence of harsh operation conditions present on offshore platforms to the design of power transformers and shunt reactors</td>
<td>S Rajamanickam - GB, S Mosbacher - AT, J Findeisen - DE</td>
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**SC A2 POWER TRANSFORMERS AND REACTORS**

**PS2: ADVANCES IN DIELECTRIC DESIGN AND TESTING**

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<td>V. Larin - RU</td>
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<td>Electric Field Analysis for Valve-side Lead-out Insulation Structure of UHVDC Converter Transformer</td>
<td>J. Zheng - CN, K.C Wen - CN, L.J. Kong - CN, X.Y. Feng - CN</td>
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<td>A2-206</td>
<td>Advances of Dielectric Frequency Response testing for HV OIP bushings</td>
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<td>Verification of Withstand Capability for Very Fast Transients of a 200 MVA, 500 kV GSU-Transformer by Modelling and Testing</td>
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R. IGNACIO - BR

A2-302  Investigation on the Operating Conditions of MV/LV Transformers and Recommendations to Improve their Reliability
WAHIB CHABANE - DZ

A2-303  Continuous improvement of transformer specifications at a large utility
C. RAJOTTE - CA, S. PROULX - CA

A2-304  Power Transformers using Esters next generation - ready to cope with all grid operation challenges

A2-305  Compatibility tests between solid and liquid materials for reliable transformers
C PERRIER - FR

A2-306  Reliability Evaluation of Ester Oil Filled Onload Tap Changers through Critical Tests
R V TALEGAONKAR - IN

A2-307  Improving the reliability of key power transformers (GSU for Nuclear Power Plants) through specifications
P HURLET - FR

A2-308  GIC Magnetic and Thermal Assessment of a Large Fleet of Power Transformers - A Case Study

A2-309  Health Index and Hierarchizing Scale Methodologies for Prioritizing On-line Monitoring of Power Transformers and Reactors in the Brazilian Transmission Grid
M. ALVES - BR

A2-310  Improving transformer reliability through operation, maintenance, repair and asset management for extended life
L. QUEIROZ - BR

A2-311  Transformer management by learning from condition, failure and scrapping data collected nation-wide
J. FOROS - NO

A2-312  Fleet Asset Management Opportunities Arising From Transient Monitoring of Power Transformers and Shunt Reactors
T. ZUPAN - HR

A2-313  Fleet screening of HVDC transformers
E ERMakov - SE

A2-314  Field experience of small quasi DC bias on power transformers A first classification of low-frequency current pattern and identification of sources

A2-315  Rationalization and high precision of transformer lifetime evaluation method
S. MIYAZAKI - JP

A2-316  Large Power Autotransformers filled with natural ester – Working parameters from the field and Maintenance notes
L. LOMBIN - IT, S. SACCO - IT, F. SCIATTIGGIO - IT, C. SERAFINO - IT, F.M. PEPE - IT, F. FERRARI - IT, D. ROGERA - IT

A2-317  Experiences in Transformer Onsite Refurbishment
Y. LI - AU

A2-318  Application of Conditional Probability assessment to optimise Transformer Design, Operation and Maintenance practices
C. BECKETT - AU, J. LAI - AU
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SHALI RAJ - IN

**A2-320** Increasing Reliability Tertiary Voltage Side of Power Transformer by Installing Relay Protection  
S. LAOHANAN - TH, S. INRUN - TH

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RAJAG KOMMU - IN, R P SATANI - IN

**A2-322** Advancements in Transformer Site Dryouts  
E. TENYENHUIS - CA

**A2-323** Power Transformer Life Extension Rebuilds  
T. O'NEILL - IE, J. CARPENTER - IE, T. NOONAN - IE

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**SC A3 TRANSMISSION & DISTRIBUTION EQUIPMENT**

**PS1: FUTURE DEVELOPMENTS OF TRANSMISSION AND DISTRIBUTION EQUIPMENT**

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**A3-102** Environmental Performance of Dead-Tank Circuit Circuit Breakers with SF6 and Alternative Gases  

**A3-103** VARC DC circuit breaker – a versatile concept for non-zero current interruption  
L ÄNGQUIST - SE

**A3-104** Innovative T&D Switching Equipment and Development of its Testing Technology  

**A3-105** Low loss DC circuit breakers and DC GIS equipment  
M. KOSAKADA - JP

**A3-106** First CO2-neutral 145 kV and up to 63 kA Dead Tank Circuit Breakers based on Vacuum Switching and Clean Air Insulation Technology  

**A3-107** Fault current limiters for electrical grids 220 kV on the base of the fast-acting highvoltage explosive commutators  
N. NOVIKOV - RU

**A3-108** Studying the characteristics of non-traditional current and voltage converters for digital substations  
A. YABLOKOV - RU

**A3-109** Power plants Modernization by Smart integrated vacuum generator breaker switchgears  

**A3-110** Development and Electrical Performance Research of a 12kV C4F7N/CO2 Ring Main Unit  
R. ZHANG - CN

**A3-111** Experience of Capacitive Current Switching of EHV and UHV AC Circuit Breaker in Power System and Test  
G. LI - CN

**A3-112** Basic aspects of switching with series-connected vacuum interrupter units in high-voltage metal-enclosed and live tank arrangements  

**A3-113** Interrupting Performance Evaluation of High-Voltage Gas Circuit Breakers Using CFD Simulation and Data Analysis Technique  
A3-114 The First Development of SF6-free 170kV 50kA 60Hz GIS with Fluoronitrile (C4F7N) Mixtures

A3-115 Case Study – Improving Reliability of Circuit Breaker by using Controlled Switching and removing Pre Insertion Resistor (PIR)
JIVESH KHANNA - IN

A3-116 Innovative SF6 Free Load Break Switch with Shunt Vacuum Interruption (SVI) Technology
C PREVE - FR

A3-117 Return of experience of the SF6-free solution by the use of fluoronitrile gas mixture and progress on coverage of full range of transmission equipment
J OZIL - FR

A3-118 C5 fluoroketone based gas mixtures as current interrupting media in high voltage switchgear
P. STOLLER - CH

A3-119 Theoretical and Practical Behaviour of Eco-friendly SF6 Alternatives in High Voltage Switchgear
J. MANTILLA - CH

SC A3 TRANSMISSION & DISTRIBUTION EQUIPMENT

PS2: LIFETIME MANAGEMENT OF TRANSMISSION & DISTRIBUTION EQUIPMENT

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H. ITO ON BEHALF OF CIGRE AG A3.01 - JP

A3-202 Operational Experience, Field Test and EMT Simulation for EHV Shunt-Reactor Switching
G. BLANCHET - NO

A3-203 CANCELLED - Ferroresonance in high voltage inductive voltage and combined transformers: Simulations and laboratory tests

A3-204 In-service Diagnosis of Grading Capacitor Dielectric Deterioration
P MOORE - GB, K WILLIAMS - GB

A3-205 Circuit Breaker De-Rating Assessment under High DC Time Constant
Z EMIN - GB, T FAIREY - GB, M V ESCUDERO - IE, J KELLIHER - IE

A3-206 Actual use survey and maintenance practice of circuit breakers for frequent switching applications
J. KIDA - JP

A3-207 A campaign for the ageing evaluation of station hollow core composite insulators after a number of years of service

A3-208 Overvoltages research in switching modes of cable and mixed overhead-cable lines, power transformers, shunt reactors and capacitor banks of 110-750 kV and development of a controlled switching device for the above electrical equipment
V. SMEKALOV - RU

A3-209 X-ray inspection of operating high-voltage oil-filled circuit breakers
L. DARIAN - RU

A3-210 On-line monitoring of paper-oil insulated current transformers

A3-211 Influence of Contact Heating on Main Circuit Resistance Measurement and Dynamic Contact Resistance Measurement in High Voltage Circuit Breakers
T. CHENG - CN
A3-212  Research on Simulation Testing Method of System Level's Strong Electromagnetic Disturbance in Substations
L. CHENG - CN

A3-213  Operational Aged Switchgear With The Age Up To 50 Years - Investigations, Testing, Results - Considerations For The Design And Operation Of Old and New Switchgear
T. GRÄF - DE, R. SCHILLER - DE

A3-214  Investigation of ferroresonance oscillations in the systems with electromagnetic potential transformers by experimental and calculation methods
A. SIVKOV - RU

A3-215  Development of 362kV 63kA 60Hz Self-Blast Breaker without additional capacitors to prevent ferro-resonance by improving the SLF performance

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A3-217  Approach & Experience of IoT Based Predictive Maintenance Technologies in Power Distribution Network
HUKUM CHAND SHARMA - IN

A3-218  Technical-Economic Study on Spark Gaps Replacement by Surge Arresters on Pole-Mounted MV/LV Transformers
WAHIB CHABANE - DZ

A3-219  Pollution and Humidity Effects on Air Insulated Switchgear (AIS) of MV/LV Substations
WAHIB CHABANE - DZ

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A3-221  Digital Disconnector and smart sensors: example of integration in the condition base asset management cloud tool
T PEGOURET - FR

A3-222  External flashover of a 245kV live tank circuit breaker
D CHUN - FR

A3-223  Monitoring of asymmetric short circuit currents at a hydro power plant using electronic fibre optical current transformers
T. HEID - CH

A3-224  Accuracy study of a combined low-power instrument transformer in different climatic and pollution conditions
T. HEID - CH

A3-225  Development of Light Asset Models based on Data Mining
T MAUFFREY - FR

SC A3 TRANSMISSION & DISTRIBUTION EQUIPMENT

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A3-302  Benchmarking the suitability of a Bi-Staple Disc Spring as Novel Ultra-Fast Actuation Principle
H. MENNE - CH

A3-303  Performance tests of circuit-breakers for controlled switching
J. KIEFER - CH
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B1-102  Development of a New High-Voltage Dry Type Cable Terminator with Optional Integrated Partial Discharge Monitoring  

B1-103  ALEGrO – Extended type testing of the HVDC XLPE cable system and additional tests for Transient Over Voltages (TOV)  
B. MAMPAEY - BE

B1-104  Mechanical characterization of smooth welded copper sheaths for high voltage submarine cables  
T. KOUTI - FI, E. KIVINEN - FI, O. OTTE - IT, G. POZZATI - IT, E. CONSONNI - IT, E. MECOZZI - IT, S. RISCIFULI - IT

B1-105  Extended Thermal Rating Calculations of 400 kV XLPE Cables for Urban Grid Applications based on long-term Experimental Data  

B1-106  Online prognostic system for cable joints for Industry 4.0  
S CHRISTOU - GB, P L LEWIN - GB, A STAVROU - CY

B1-107  Development HV External Gas Pressure Cable Systems Retrofit  

B1-108  Total System Development on Innovative and Large Scaled HVDC Cable System towards Expanded Installation of Large Offshore Wind Farms  
K. KOYAMA - JP

B1-109  Machine Learning Based Temperature Forecast for Offshore Windfarm Export Cables  
S. H. H. KAZMI - DK

B1-110  Comprehensive tests of the 1200 m HTS DC cable system for Saint-Petersburg  
A. KASHCHEEV - RU

B1-111  A Novel Self-healing Intelligent Power Cable Sheathing Material  
L. PENG - CN

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E.C. BASCOM III - US, J. WILLIAMS - US

B1-202  230 kV Mixed Transmission Line: Submarine, Underground and Overhead  
J. LOPES - BR

B1-203  Qualifying an extruded 420 kV cable system for installation in a 4 km long blasted tunnel  
K. RØNNINGEN - NO

B1-204  System Analysis of Fiber Optic Cable Faults in Underground Cable Systems  
R. STØLAN - NO
B1-206 Cable design for deep water applications and low losses transmission links: first project experience
M. CHATZIPANOS - GR, I. MARGARIS - GR, K. TSIREKIS - GR, S. KATEMLIADIS - GR, D. KOSTOPOULOS - IT, A. TROLLI - IT, E. CONSONNI - IT, D. PARRIS - IT

B1-207 Rigorous calculation of external thermal resistance in non-uniform soils
A. I. CHRYSOCHOS - GR, D. CHATZIPETROS - GR, D. N. KOSSYVAKIS - GR, V. L. KANAS - GR, K. PAVLOU - GR, K. TASTAVRIDIS - GR, G. GEORGALLIS - GR

B1-208 Evaluation of Degrees of Freedom for the Design of Metallic Screen Grounding Systems of Long HVDC Underground Cable Systems

B1-209 Long Horizontal Directional Drill for 220 kV Subsea Cable Installation
T. RALPH - IE

B1-210 Statistics, experiences and learnings from failures in power cable systems during pq and type tests, tests after installation and service operation
P. VAN DER WIELEN - NL, H. VAN MAANEN - NL, E. PULTRUM - NL, E. STEENNIS - NL

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P. CHRISTENSEN - DK

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A. MARTIN - ES, A. MUÑIZ - ES, R. COBO - ES, G. DENCHE - ES

B1-213 Study on Recognition and Location of Partial Discharge in XLPE Cable under Damped AC Voltage
L. ZHANG - CN

B1-214 Qualification process of ±400 kV HVDC extruded cable system
X. GU - CN

B1-215 3D-FEM modelling of losses in armoured submarine power cables and comparison with measurements

B1-216 Proposal for a non-destructive protocol for the Verification of Absence of Voltage of Insulated Cable Systems
P. MIREBEAU - FR

B1-217 Construction of underground conduits through structures with a depth of more than 25 meters under the canal
P. SRIWAN - TH

B1-218 Development of Self-healable Insulator Applicable to High Voltage Pre-molded Joint

B1-219 Development of Wet Type AC 66kV TR-XLPE Insulated Cable

B1-220 A Numerical Study on DC Electric Field Distribution in HVDC MI-PPLP Cable Considering Parameters Related to Load Cycle Test

B1-221 Design and Development of Back-to-Back Gas-to-Cable Termination for 420kV Gas Insulated Switchgear
M. MOHANA RAO - IN

B1-222 Power Cables insulation & establishing relationship between insulation level selection and aging
ROBIN GIRI - IN

B1-223 Damage on the 110 kV cable during measurements on the earthing system
JURE STRMEC - SI
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B2-102 A structural reliability approach to transmission line engineering – a consistent way to make use of monitoring and inspection data
A. ISTAD LEM - NO
B2-103 Development of sensors for real-time monitoring of ice loads on overhead lines
B. E. NYGAARD - NO

B2-104 The THOR Hammer Tester – A Step Change in the Management of Wooden Utility Poles
R EYRE-WALKER - GB, R BRYANS - GB, C DOW - GB, B SRISKANTHARAJAH - AU

B2-105 An Approach to Determine Temperature Exceedance in Overhead Line Compression Fittings
T. KAVANAGH - IE

B2-106 Utilization of environmental factor maps and corrosion rate maps for advanced maintenance of overhead transmission towers
S. OHARA - JP

B2-107 CANCELLED - Application of Unmanned Aerial Vehicles (UAVs) for Patrol and Inspection of Overhead Transmission Lines

B2-108 Experimental Study and Mechanism Analysis of Abnormal Fever Composite Insulators in AC 500kV Overhead Line
M. LU - CN

B2-109 A Development of Compact Corrosion Detector to Diagnosis of Aged Overhead Conductor

B2-110 Indian Experience of Refurbishment of Tower Foundation located in water bodies
CHAITANYA KUNTE - IN

B2-111 Creation of a geographic information system of thunderstorm activity based on the existing complex of 6-110 kV grids using the devices for identifying faults in OHL
A. KUCHERAVENKO - RU

B2-112 Practical Procedure to Define the Maintenance Priority of Transmission Line Cables
S. ASTO - PE

B2-113 Holistic Regulatory Framework of Resilience for Electrical Facilities against Wildfire
R. SERRANO - CL

B2-114 Overhead powerline LiDAR inspection with unmanned aerial vehicles
A. COELHO - PT

B2-115 Remote monitoring overhead lines using satellite images
N. PINHO DA SILVA - PT

B2-116 Condition Assessment Study of OHTL Steel Towers in Iceland
A. B. JONASSON - IS

B2-117 Artificial Intelligence (AI) Augmented Transmission Line Inspection
J. TOTH - IS

B2-118 Limits of vibration amplitude measurement based conductor fatigue design
K. SCHILLAI - CH

B2-119 Hydrophobicity Classification of Composite Insulators Using Convolutional Neural Networks

SC B2 OVERHEAD LINES
PS2: ENHANCING OVERHEAD LINE PERFORMANCE

B2-201 Flexible HTLS-High Temperature Low Sag Conductor
S. UEDA - BR
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<td>Optimization of losses in new 400 kV overhead lines</td>
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<td>Field experience and laboratory results on the application of RTV coating on HVDC lines</td>
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<td>Development and implementation of digital line-to-cable termination points for connecting 110 kV overhead and cable lines</td>
<td>M. ERMOSHINA - RU</td>
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<td>P. ZHAO - CN</td>
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<td>B2-217</td>
<td>Experience of Live Line or Zero Shutdown Reconductoring in India</td>
<td>SHACHIDEVI T. K. - IN</td>
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<td>B2-218</td>
<td>Assessment of performance of insulators through leakage current monitoring under contaminated conditions</td>
<td>J.M. GEORGE - FR</td>
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<td>B2-219</td>
<td>Development and realization of a complex transmission line management system</td>
<td>BALINT NEMETH - HU</td>
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Research of steel - aluminium plastically compacted conductors for overhead lines (OHL)
V. KURYANOV - RU

Technical Demands to Improve Today’s Composite Insulator Reliability
C. BAER - CH

Comparing the Corona Performance of AC and DC Overhead Lines in both Indoor and Outdoor Experiments Using novel Techniques
P. BLEULER - CH

An integral approach to ensuring the integrity of the tower and conductors
NENAD GUBELJAK - SI

Case of Dynamic Line Rating (DLR) for Overhead Transmission in Context of Tropical Countries Like India
SMRUTI RANJAN MOHAPATRA - IN

CANCELLED - Study of a live line maintenance routine and development of a device and special procedures for increased safety

Development of an Overhead Transmission Line Portable Protective Arrester (PPA) for Live Work

Robotic installation of aircraft warning markers on transmission lines
L. M. DICKIE - NO

Exposure of workers to electric and magnetic field during maintenance work on double-circuit overhead power lines
MAJA GRBIC - RS

Audible Noise Management of Newly Reconductored Transmission Lines
J. RANIGA - AU, R. URBAN - AU, A. LAPTHORN - AU, S. HARDIE - AU

Selecting Equipment for Construction of Overhead Lines Based on CO2 Emissions Calculation
F. GHELICHI - IR, M. SAYYAH - IR, M. ABDOLHOSSEINPOUR - IR, R. GHRBANI - IR

UAV (Unmanned Aerial Vehicle) Electromagnetic Fields (EMF) Compatibility and Tests requirements for use in OHL
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**PS2: MODELLING OF THE FUTURE GRID BASED ON LESSONS LEARNED FROM SYSTEM EVENTS**

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X. DONG - CN

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C4-302 Impact of WTG converter impedance model on harmonic amplification factor of the Dutch 110 kV transmission network using a 383 MW wind farm case study
D. VREE - NL, L. BELOQUI LARUMBE - NL, Z. QIN - NL, P. BRAUER - NL, B.C. UMMELS - NL

C4-303 Proposition of the Superposition Method with Multiple Sources and Impedances in order to Attribute Responsibilities over Harmonic Distortions
M. CARLI - BR

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J. B. KWON - DK

C4-306 Resonance in ESS Operation in a Large Scale Plant System with Capacitor Bank

C4-307 High-order harmonic resonance phenomena in the frequency range from 2 kHz to 9 kHz of low voltage system in Japan
J. YOSHINAGA - JP

C4-308 Considerations on the frequency-dependent grid impedance in meshed HVAC grids - Parametric sensitivity analysis and impact of power electronic assets

C4-309 Frequency and time domain field tests and cable model validation for the Italy – Montenegro 500 kV HVDC submarine cable link
F. PALONE - IT, L. BUONO - IT, F. PALONE - IT, F.M. PEPE - IT, F. ROMANO - IT, B. CERESOLI - IT, F. OLDAZZI - IT, N. KULJACA - ME

C4-310 Trends in Power Quality Disturbance Compatibility in Australia
N. BROWNE - AU, S. ELPHICK - AU, T. BROWNE - AU

C4-311 Power Quality Monitoring Of HVAC Solar Power Station Using Sequence Voltages From Synchronaser – A Case Study
C. RETHI NAIR - IN

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F. ISSOURIBEHHERE - AR
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P. MIGUEL - BR

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K. VELITSIKAKIS - NL, J. VAN WAES - NL, I. TANNEMAAT - NL, C. ENGELBRECHT - NL, N. PAPAZCHAROPOULOS - NL

C4-318 The comparison of the different methods for the determination of the shielding failure rate of a transmission overhead line
I. TANNEMAAT - NL, K. VELITSIKAKIS - NL

C4-319 Lightning protection of wind turbines constructed in heavy lightning area
K. YAMAMOTO - JP

C4-320 Dynamic Lightning Protection of Smart Grid Power Load Centers
C. TONG - CN

C4-321 Lightning Analysis for ±500kV HVDC XLPE Cable System Combined with Overhead Transmission Lines

C4-322 Capacitors Banks for Reactive Power Compensation in Wind Power Plants: Aspects of Electromagnetic Transients and Components Specification
D. SENA - BR

C4-323 A Comprehensive Assessment of Concerns and Mitigation Measures for the Application of Inline Reactors to Reduce Short Circuit Levels
I. RAHIMI - CA

C4-324 Voltage and Current Inversion and its Impact on Distance and Differential Protective Relaying in an Overcompensated Transmission System
H ERIKSSON - SE

C4-325 Post-mortem incident analysis on a hydro power plant main transformer by digital simulation – A Case Study of dielectric failure due to Transformer-GIS interaction
C. CARDOSO - PT

C4-326 Development of Desert-Dust and Sea-Salt Deposition Database Required for Outdoor Insulation Coordination in Israeli Power Grid
E. VOLPOV - IL

C4-327 Experimental Investigation of Ground Return Currents and Mutual Induction in Extruded Cables
S. NAUTA - NL, P. KROPMAN - NL, F. PROVOOST - NL, M. VAN RIET - NL

SC C5 ELECTRICITY MARKETS AND REGULATION
PS1: THE CHANGING NATURE OF MARKETS AND ANCILLARY REQUIREMENTS

R.B. HYTOWITZ - US
C5-102 Need of Improvements in the Brazilian Energy Market to Consider Separate Prices for Energy and Services
J. MELLO - BR

C5-103 Market Transformation to Value Energy, Reliability, and Flexibility Services

C5-104 From services to markets – system and market impacts of energy transition in European markets
R. HIRVONEN - FI, A. SIHVONEN-PUNKKA - FI, G. DOORMAN - NO

C5-105 Principles for allocation of cross-zonal capacities for the exchange of balancing capacity or sharing of reserves

C5-106 System Operator Challenges in Spot Market
ENG.S AL-RAWAHI - ZW

C5-107 Incentivizing Generator Flexibility Investments: A Stochastic Analysis of Various Market Designs

C5-108 System Services for Power Systems with a High Level of Renewables
N. DELANEY - IE

C5-109 Integrating multi-period uncertainty management reserves into the Irish balancing market
J. GING - IE

C5-110 Evolutions of Japanese markets to secure appropriate ancillary service corresponding to a large amount of RES installation - Establishment of Capacity market and Balancing market -
Y. TAKAMIZAWA - JP

C5-111 Market Integration of HVDC Lines: Cost Savings from Loss Allocation and Redispatching
A. TOSATTO - DK

C5-112 Identifying Emerging Ancillary Services changes in the Australian NEM
I. ROSE - AU, J. EGGLESTON - AU

C5-113 Research on Coordination Optimization Strategy of Peak Shaving and Frequency Modulation Auxiliary Service
W. ZHENG - CN

C5-114 A world-first: On the pooling of battery energy storage and pumped-hydro
A. SCHNEIDER - DE, L. BAHNER - DE, R. BUCHER - DE

C5-115 On lost profit calculations and pricing in liberalized power markets
V. BOROKHOV - RU

W. WONGLIMAMORNLERT - TH

C5-117 Transition From Administered To Market Linked Imbalance Handling Mechanism In Indian Electricity Market
K.V.N. PAWAN KUMAR - IN

C5-118 The Economic and Environmental Value of the Demand Response Market in Korea

C5-119 Experience of Implementation of Reserve Regulation Ancillary Services and Fast Response Ancillary Services in India
ANUPAM KUMAR - IN

C5-120 To socialise or not to socialise the cost of imbalances from non-programmable renewable generation
N. PINHO DA SILVA - PT
C5-121 Implementation of Security Constrained Economic Dispatch Pan India
PHANISANKAR CHILUKURI - IN

SC C5 ELECTRICITY MARKETS AND REGULATION
PS2: CHANGING ROLE OF REGULATORS AND STANDARDS

C5-201 A Holistic Framework for Electricity Market Design: The Benefits of Regulatory and Market Coordination

C5-202 Evolution of Regulatory Framework on Reinforcements, Improvements and End of Useful Life of the Electric Power Transmission Assets in Brazil
E. NEVES - BR

C5-203 Assessing the Pricing Approach for Renewable Energy Reserve Auctions in Brazil: Do We Have Misleading Prices?
A. PERRELLI - BR

C5-204 Regulation of Economic Incentive for the Improvement of the Operational Performance of the HVDC Transmission System in Brazil
S. FEITOSA - BR

C5-205 Constrained-off energy events in wind farms on Brazilian Market
R. FERREIRA - BR

C5-206 CANCELLED - The Impacts of Carbon Pricing in PJM

C5-207 CANCELLED - Mexico´s Bilateral Market-An Alternative for Renewable Energy Development?

C5-208 The transition to new dynamic market arrangements in Ireland and Northern Ireland in the context of high levels of variable renewable generation
A. M. DOWNEY - IE

C5-209 Renewable Energy Targets and Policies in Turkey and Development of Photovoltaic Solar Energy
HUSEYIN ALTUNTAS - TR

C5-210 Sensibility to Consumers' Outflow
V. BEREZOVSKY - RU

C5-211 Market tools for managing thermal generation fleet.
G. LABUTIN - RU

C5-212 Research of China's two tier spot market and its evolution path
L. MA - CN

C5-213 The realization of the fairness and efficiency goals in the electricity market and its application in the Guangdong power market
Z. JING - CN

C5-214 A Novel Demand Response Market Clearing Auction Model for Independent System Operators
M. AHMED - CA

C5-215 Financial Systemic Risk Level Model_C5-PS2
J. CARDONA - CO

C5-216 Assignment of transmission system installations after the regulatory changes approved in 2016 in Chile
J. TORO - CL
C5-217 From a system of shared payment between generators and customers to a regime of payment of final customers
J. TORO - CL

SC C5 ELECTRICITY MARKETS AND REGULATION

PS3: MARKET DESIGNS FOR CO-ORDINATION OF GENERATION AND NETWORK INVESTMENTS

C5-301 Latent Clustering Model for Co-optimization of Transmission and Generation Investments Under Uncertainty
J. BUKENBERGER - US, M. WEBSTER - US

C5-302 Socio-economic competitive costs for flexibility-based alternatives to traditional investments in distribution network capacity
E. GRAMME - NO

C5-303 Development and Impact of Flow-Based Methodology in Core Region
M. VAJDIC - HR

C5-304 Improving wholesale electricity market design for electric power systems with high shares of intermittent renewable energy sources
M. C. DALENA - IT, S. CIANCIO - IT, V. MORRI - IT

C5-305 The consideration of novel and flexible network usage in Japan - Attempts to minimize social cost by optimizing network investment considering generation curtailment -
K. FURUASAWA - JP

C5-306 Ancillary Services Market reform according to the new European Electricity Directive: open points for the design of the future TSO-DSO coordination and the DSO's procurement of flexibility services in the Italian context
G. LENA - IT, S. LIBRATTI - IT, M. MAURO - IT

C5-307 System strength, inertia and network loss factors - implications for power networks and renewable generation
S. HINCHLIFFE - AU, J. EGGLESTON - AU

C5-308 The Role of Price Signals in the Economically Efficient Integration of Demand Response and Distributed Energy Resources with the Central Electricity Supply System
L. HOCH - AU, D. BOWKER - AU

C5-309 Evaluating Various Battery Behaviours to Maximise Consumer Value Across the Electricity Supply Chain
E. MA - AU, J.C. DENNIS - AU

C5-310 Improved method for calculating ISKs based on node transmission contribution
X. LI - CN

C5-311 How to Give a Reasonable Economic Signals Through Transmission Service Cost: Analysis based on Game Theory with the Example of Korean Transmission System

C5-312 Markets and platforms to coordinate the procurement of system services from large-scale and small-scale assets connected to the electricity network
C. MADINA - ES, M. SANTOS-MUGICA - ES, I. GOMEZ-ARRIOLA - ES, J. JIMENO - ES

C5-313 Strategy for Northeast Asia Power System Interconnection Technical Assistance to Mongolia General Overview of a Northeast Asia Power Trade
P. LIENHART - FR

SC C6 ACTIVE DISTRIBUTION SYSTEMS AND DISTRIBUTED ENERGY RESOURCES

PS1: ADVANCED DISTRIBUTION SYSTEM DESIGN INCORPORATING DISTRIBUTED ENERGY RESOURCES

C6-101 Analysis of Voltage Stability Index for a Distribution Grid with Photovoltaic and Battery Energy Storage Systems
T. BLASI - BR
C6-102 Analysis of Benefits After Installing Battery Energy Storage in Distribution Feeder with Presence of Photovoltaic Plants in Brazilian Electrical System
S. ROCHA - BR

C6-103 Impacts of a Power Storage Systems Based on Lead Carbon and Lithium Technologies in 13,8 kV Distribution Network - Technical, Economic and Regulatory Challenges
L. LEITE - BR

C6-104 Lessons learnt from the 800 MWh Utility Scale Battery Energy Storage Systems (BESS) Project in South Africa
K. DEDEKIND - ZA

C6-105 CANCELLED - A Practical Application Case of Large Scale Energy Storage System for Energy Arbitrage at Steel Plant

C6-106 Contribution of energy storage to capacity adequacy – Application to island power systems
G. N. PSARROS - GR, A. G. PAPAKONSTANTINOU - GR, S. A. PAPATHANASSIOU - GR, J. S. ANAGNOSTOPOULOS - GR, N. G. BOULAXIS - GR

C6-107 Research on SOC balanced control of flexible group energy storage system with echelon used batteries
M. LUO - CN

C6-108 Distributed Resources Providing Ancillary Services: operating DSO owned storage without market interferences
M. ROSSI - IT, G. VIGANO’- IT, D. CLERICI - IT, D. MONETA - IT

C6-109 Implementation of Battery Energy Storage for Frequency and Power Profile Regulation, and Spinning Reserve Management
P. ZINCK - CA

C6-110 Energy storage application for improving transients performance of synchronous distributed generation
V. SAMOYLENKO - RU

C6-111 Assessment of distribution grid losses depending on storage location for residential PV systems in three grids in the region of Murcia

C6-112 Considerations for Energy Storage in Distribution Planning

C6-113 Accounting for the uncertainty associated with consumer-led demand side response
G. MCFADZEA - GB, G. EDWARDS - GB, M. MCFARLANE - GB, C. HIGGINS - GB

C6-114 Modelling Considerations for Assessing Smart Inverter Functions - A Case Study from Northern California

C6-115 Using advanced modular FACTS to increase flexibility of distribution networks and enable the connection of more distributed energy resources
C. WINNING - GB, M. FARIDI - GB, B. KELLY - IE

C6-116 Optimization of the Effect of Electric Vehicle Charging Stations by Genetic Algorithm
H. CIFTCI - TR

C6-117 Effects of Electric Vehicles Charging on Power Distribution Systems “A Case Study in Aqaba-Jordan”
R. DAHoud - JO

C6-118 Research on Ordered Charge Control System of Electric Vehicles Based on New Acquisition Communication and Control Equipment
L. JIANG - CN

C6-119 A Conceptual Framework for Sub-Transmission Expansion Planning of Active Distribution Systems, focused on South American Networks
M. SAMPER - AR
Achievements, Experiences, and Lessons Learned from the European Research Infrastructure ERIGrid related to the Validation of Power and Energy Systems  

CANCELLED - Automated Target Grid Planning in Distribution Systems Considering Optimization of Grid Structures

Installation of DER in Distribution Automation Schemes  

Innovative Solutions for Smart Management of Power Grids  

Voltage Control in the Active Networks, Oman Case Study  
ENG. AHMED AL-NADABI - ZW

CANCELLED - A Study on the System Architecture of Typical Energy Use Scenarios in Industrial Parks

Smart Transformer Use in Net-Zero Energy Factories  

Reduction method for planning cross energy carrier networks in the cellular approach applicable for stability assessment in low-voltage networks  
A. TRAUPMANN - AT, M. GREIML - AT, T. KIENBERGER - AT

SC C6 ACTIVE DISTRIBUTION SYSTEMS AND DISTRIBUTED ENERGY RESOURCES  
PS2: ENABLING TECHNOLOGIES AND SOLUTIONS FOR DISTRIBUTION SYSTEMS

Distributed Energy Resources aggregation platforms for the provision of flexibility services by Working Group C6.35  
A. OUDALOV - CH

Microgrid Control Platform to Provide Industrial Site in the USA with Efficient and Reliable Management of Distributed Resources and Energy Storage Systems  

Optimal Energy Management and Control for Load Management in V2G EV-integrated Microgrid  

Cyber-Physical Resilient Interoperable Microgrid Networks  

Using a Real Time Digital Simulator to Test a Microgrid Integrated Solar Storage Technology  

A Microgrid Validation Centre to enable Validation and Optimisation of the Design, Simulation, Intelligent Control and Asset Management of Microgrid  
M OSBORN - GB, S CRAY - DE, S OBERHOFER - DE, S SCHNEIDER - GB

Cellular approach and new grid edge solutions for distribution systems and industrial sites in Germany  
B. BUCHHOLZ - DE, P. NOGLIK - DE, V. BUEHNER - DE

Demonstrating a Virtual Power Plant on the Isles of Scilly  

Real-Time Control Algorithm for the Integration of a Battery Energy Storage System to Optimize the Power Generation on a real Island Microgrid System: Conceptualization and Validation  
J. IGLESIAS - ES, C. GARCÍA - ES, R. PINTO - PT
C6-210 4-legs electronic active load for anti-islanding evaluation  

C6-211 Battery Energy Storage System based Voltage and Frequency Control of An Island Distribution Network  
P PONNAGANTI - DK

C6-212 Enhancing flexibility, reliability, and resilience of isolated power systems via Variable Speed Diesel Integration  
M. NEGREVITSKY - AU, J. HAMILTON - AU, E. SEMSHCHIKOV - AU, X. WANG - AU

C6-213 CANCELLED - Smart Rural MicroGrid Solutions for Off-grid Applications

C6-214 ENEL experience in rural electrification in South America area  
E. VALIGI - IT, L. COCCHI - IT, M. GARCIA BUSTOS - BR

C6-215 Conceptualising hybrid power system and microgrid design for a remote touristic village supply  
ESMA MUSIC - BA

C6-216 Tapping of Power from Overhead Earthwire of EHV Transmission Line to Supply Remotely Located Load-Powergrid Experience  
DHEERAJ SRIVASTAVA - IN

C6-217 A simple rule-based energy management system for off-grid system  

C6-218 Hardware in the loop microgrid controller testing  
H.M. SANCHEZ - CO

C6-219 Novel Control of Multi-Level Inverter Based Microgrid with Hybrid Generation  
BHAVESH R. BHALJA - IN

C6-220 Development of a state estimator based modular toolset  
BALINT HARTMANN - HU

C6-221 Active Distribution Test System for Typical New Zealand MV and LV Networks  
N. K. C. NAIR - NZ, S. SHIRZADI - NZ

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D1-101 Predictive maintenance based on continuous monitoring of OLTCs electrical signatures  
A. BARBOSA - BR

D1-102 Development and implementation of Partial discharges on-line monitoring module in GIS 110KV switchgears  
W GIL - PL

D1-103 Identification and Improved Quantification of Inhibitors in Mineral Insulating Oils using FTIR Spectroscopy and Partial Least Squares Regression  
P. ÅGREN - FI, T. LILLHONGA - FI, L. MELZER - SE

D1-104 Influence of temperature variation on transformer bushing monitoring  
N ABEEKWICKRAMA - SE

D1-105 A New Partial Discharge Measuring System in HGIS Based on Magnetic Field Antennas  

D1-106 Challenges for space charge measurements with the PEA technique in the thick insulation of HVDC Cables  
M. ALBERTINI - IT, S. FRANCHI BONONI - IT, D. PINI - IT, G. MAZZANTI - IT, P. ROMANO - IT, A. IMBURGIA - IT, E. RIVA SANSEVERINO - IT, G. RIZZO - IT, G. ALA - IT
D1-107 Cigré Prototype Installation Test for Gas-Insulated DC Systems - Testing a Gas-Insulated DC Transmission line (DC-GIL) for ±550 kV and 5000 A under Real Service Conditions

D1-108 Evaluation of dynamic loading capability for optimal loading strategies of power transformers

D1-109 Partial Discharge Analysis in Gas-Insulated HVDC Systems Using Conventional and Non-Conventional Methods

D1-110 Spectral measurement of the precipitations composition in OIP insulation of the high-voltage bushings
M. LYUTIKOVA - RU

D1-111 A measurement system for insulator puncture test with short front impulse voltage
Y. LI - AU, W. YAN - AU

D1-112 Extended Frequency Range Testing of HV Cables
J. TUSEK - AU

D1-113 PD Testing Setup Composed by GIS, Cable and Power Transformer to Compare Different PD Monitoring Technologies

D1-114 On-Line Diagnosis Methods for Transformer Winding Deformation Based on Running Voltage and Current Correlation Mining

D1-115 Development of a Multi-Parameter Online Monitoring Equipment for EHV Transformer Bushing
L. ZHANG - CN

D1-116 Proposal of a Calibration Methodology of UHF Partial Discharge Measurements for Power Transformers

D1-117 A new method for evaluating the degree of polymerization of paper insulation of power transformers
A. SABITOV - RU

D1-118 Field Experience in Oil-filled Power Transformers Fault Diagnosis by Frequency Response of Stray Losses (FRSL)
P. SINGKHAWAT - TH

D1-119 Analysis of puncture breakdown characteristics according to inner defect types of GIS epoxy insulator

D1-120 Oxidative degradation of mineral oils in power transformers over service time. Effect of the economic owner on maintenance strategies
A. ZAYA-JIMENEZ - ES, L. ARBELAEZ-OROZCO - ES

D1-121 Development of OF Cable Insulation Deterioration Diagnosis Technique Using Support Vector Machine

D1-122 Monitoring of active part drying for instrument transformers by dielectric measurements
C PERRIER - FR

D1-123 Measurement and behavior of partial discharge for SF6 substitute gases in HVDC GIS/GIL
C TOIGO - FR

D1-124 CANCELLED - Composite Voltage Test for HVDC Equipment

SC D1 MATERIALS AND EMERGING TEST TECHNIQUES
PS2: FUNCTIONAL PROPERTIES AND DEGRADATION OF INSULATION MATERIALS

D1-201 CANCELLED - Recent Testing of Aramid Insulation for Liquid Immersed Power Transformers
D1-202 Proposal of test method for evaluating the induction time (IT) of natural ester insulating oils
A. MARTINS - BR

D1-203 LCA and Smoke Test of Dielectric Fluids based on Natural Esters
F. SCATIGGIO - IT, E. BREDA - IT, L. CALCARA - IT, G. CAMPI - IT, L. PARODI - IT, R. PEDRALI - IT, M. POMPILI - IT

D1-204 Investigation into the effect of cold temperature on the physical properties of dielectric liquids
P M LIVESEY - GB, J MALDE - US

D1-205 CANCELLED - Mechanical and Electrical Performance of High-Stressed Composite Hollow Insulators for 800kV HVDC Wall and Transformer Bushings

D1-206 Characterization of pressboard mechanical properties for understanding the dynamic behaviour of transformer winding clamping pressure

D1-207 A new type of failure of composite insulators: service experience, degradation characteristics, root cause, experimental simulation and countermeasures
X. LIANG - CN, W. BAO - CN, Y. GAO - CN, S. LI - CN

D1-208 Investigations of long-term transition processes on solid-gas insulated HVDC bushings under high thermal and electrical stress

D1-209 The Electrical Characteristics of Low Current Surface Discharges with Liquid Electrodes and the Adaption of Test Parameters for a DC Inclined-Plane-Test

D1-210 Analysis of stray gas according to oil characteristics and vacuum process conditions of insulation oil in power transformer

D1-211 Analysis Of 400 Kv Failed Silicone Rubber Insulators: Role Of Micro-Cracks In Glass Fiber Rod And Electric Field Distribution In Failure Mechanism-Case Study
NITIN R SHINGNE - IN

D1-212 Implementation of space charge measurement using the Pulsed Electro-Acoustic method during ageing of HVDC model cable
L BERQUEZ - FR

D1-213 Low temperature behaviour and dielectric performance of Fluoronitrile/CO2/O2 mixture
M. WALTER - CH

D1-214 Degradation of insulating gases with low environmental footprint in operation
P. STOLLER - CH

SC D1 MATERIALS AND EMERGING TEST TECHNIQUES

PS3: INSULATION SYSTEMS OF ADVANCED COMPONENTS

D1-301 CANCELLED - Byproduct-free curing of a highly insulating polyethylene copolymer blend: an alternative to peroxide crosslinking

D1-302 Replacement of area substation transformers with flexible units of reduced footprint and increased overloadability
R SZEWCZYK - PL
D1-303  New test procedure intended to evaluate adhesion of core/housing interface of composite insulators
I GUTMAN - SE

D1-304  Measurement and simulation of transient field stresses and impacts on advanced insulation design and new test procedures for HVDC components

D1-305  3D Printed Solid Insulator: Possibilities and Challenges
M. KURIMOTO - JP

D1-306  Features of the choosing insulation voltage of AC systems under increased frequency
T. SHADRIKOV - RU

D1-307  Electric Field Relaxation by Functionally Graded Insulating Materials in GIS

D1-308  Erosion Performance of Boron Nitride Filled Silicone Rubber Composite as an Outdoor Insulator Weathered Material
M. JO THOMAS - IN, SINDH A V BABY - IN

D1-309  Dielectric stress on and design of GIS support insulators for HVDC-applications
U. STRAUMANN - CH

SC D2 INFORMATION SYSTEMS AND TELECOMMUNICATION

PS1: THE IMPACT OF EMERGING INFORMATION AND COMMUNICATION TECHNOLOGIES ON ELECTRIC POWER UTILITIES

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D2-102  Artificial Intelligence Applications to Electric Power Systems Asset Management
A.P. APOSTOLOV - US

D2-103  Failure reduction and predictive replacement approach for overhead lines using big data and advanced analytics
A. FRAIOLI - IT, G. RICCI - IT, A. FOSSI - IT

D2-104  Incremental machine learning implementation for voltage forecasts and predicted violation alerts
A KULKARNI - GB, S KUMAR - GB, R BROWN - GB, S DUDLEY - GB

D2-105  Developing Enhanced Information and Data Exchange to Enable Scalable TSO-DSO Interoperability
G A TAYLOR - GB, E LAMBERT - FR, M USLAR - DE, F MARTEN - DE

D2-106  Improvement of operability and maintainability using new information and telecommunication technologies
Y. SAKAMOTO - JP

D2-107  Artificial Intelligence and Machine Learning Applications in the Distribution Network in Greece
M. CHAMPAKIS - GR, G. TSIROPOULOS - GR, D. STRATOGIANNIS - GR, D. PAPAKONSTANTINOU - GR, G. M. MESSINIS - GR, N. D. HATZIARGYRIOU - GR

D2-108  Adopting IIoT Technology to Realize Controllability of Existing Small-scale Distributed Energy Resources
S. LAI - TW, C. CHEN - TW, W-J. WU - TW, Z-X. XEI - TW, C-S. CHEN - TW

D2-109  Electric Power Utilities Disturbance analysis using Bayesian Networks of Events
G. ARROYO-FIGUEROA - MX

D2-110  Development of intelligent control systems for decentralized distributed energy resources based on a digital platform
S. KOVALYOV - RU

D2-111  Application of modern information and communication technologies for improving the effectiveness power systems
A. RODIONOV - RU
Machine learning as a tool to improve the efficiency of high-voltage power equipment lifecycle management
A. KHALYASMAA - RU

Research and Application of Virtual Dispatchers in Intelligent Distribution Network Based on Artificial Intelligence
W. ZHENG - CN, W. LIU - CN, H. LIU - CN, J. FU - CN, Y. YANG - CN, L. CHEN - CN, Y. ZHU - CN

Research on the Architecture for Smart Energy Service System Based on Industrial Internet
X. DONG - CN

CANCELLED - The IoT solution architecture for Power Distribution and its application

An Instance Segmentation and Depth Perception based Obstacle Detection and Distance Measurement Method for Substation Patrol Robot
H. XU - CN

An intelligent power grid post-fault restoration support system based on knowledge graph
J. LU - CN

Experience of development and implementation of automated system for monitoring and analysis of functioning of relay protection devices (IED's) and assessment of correct protection operation
O. FEDOROV - RU

Development an AI Algorithm and Drone Operation System for Diagnosis of Transmission Facilities in KEPCO

Peer-to-Peer Energy Trading: A Case Study in Thailand
S. KAEWCHIRD - TH

Facilitating Power Banking And Overarching Arrangement Through Smart Contracts Based On Block Chain Technology
SANTOSH KUMAR JAIN - IN

MANINT Project: Digital Transformation of the Management of Transmission Grid Operating Assets
M. GARNACHO - ES

A Multi-Agent System platform for State Estimation in power distribution grids in the context of distributed generation
A. COJOACA - RO

Internet of Distributed Energy Architecture (IDEA): new approach on transactive energy
I. CHAUSOV - RU

Impact of Big Data, Internet of Things and Analytics in Indian Power System - A Case Study
PRAVEEN KUMAR AGARWAL - IN

CANCELLED - Smart Grid Developments in India

CNDbot: A Robot for Operation Information Management in the Colombian Power Grid
S. JIMENEZ - CO

On the Path to Autonomous Power System Management
M. SUBASIC - CH

How to deploy Augmented Reality solutions into day to day DSO operations
MATJAŽ OSVALD - SI

Management of data from smart measuring device for predictive maintenance
MAJA SAVINEK - SI
D2-201 Assessing Blockchain Technology to Enable High DER Scenarios Using Hardware in the Loop Testing

D2-202 Distributed Energy Resources and the Smart Grid: The Role of Soft Cybersecurity
G. AZEVEDO - BR

D2-203 Leveraging SOC-as-a-Service to Counter Some of the Cybersecurity Challenges of Combined IT and OT Operations

D2-204 Applying Automated Cyber Risk Assessment for the Smart Grid
D. CAMPARA - BA

D2-205 CYber Resilience framework for ENergy systems
G. DONDOSSOLA - IT, R. TERRUGGIA - IT, M.G. TODESCHINI - IT

D2-206 An Intrusion Detection System for the Smart Grid based on Computational Intelligence Algorithm
G. ARROYO-FIGUEROA - MX, I. ROJAS - MX, A. HERNANDEZ - MX

D2-207 Security threats and challenges in the transmission of condition and forecast data for determining the availability of substation equipment
T. BOEHM - DE, K. VIERECK - DE

D2-208 Collaborative Cybersecurity Solution for Substations
S. WANG - TW, S. SUDAKOV - TW, K. WU - TW

D2-209 Boosting Cybersecurity in Communication Gateways for Better Substation Protection and Control
J. LIN - TW, C. LIANG - TW

D2-210 Critical Infrastructure Cyber Security: Applications of Machine Learning and Artificial Intelligence in Detecting, Responding to and Containing Threats
L. WATTS - AU

D2-211 Cybersecurity challenges related to Distributed Energy Resources and Flexibility Providers
F. RAMÍREZ - ES, V. SAIZ - ES, D. ANDRES - ES

D2-212 Cybersecurity for EV charging infrastructures communications based on a tool developed to identify cyber-attacks and to restore security

D2-213 Cyber Secured Grid Operations with Machine Learning Implementation- A Case Study
Y.S. KULKARNI - IN

D2-214 Duke Energy implements corporate wide standard for Secure Access & Device Management (SADM) to improve Grid Reliability and Operational Efficiencies
A. HAMDON - CA

D2-215 Assuring secure access for operation and maintenance to substation-based telecom devices
J DE GEVIGNÉY - FR

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D2-301 Challenges in the Migration to Packet Switched Networks for Teleprotection Service of Power Transmission Lines
L. LEITE - BR
Time Distribution Applications in the Power Utility Environment
A. VIRO - FI, J. SUOMALAINEN - FI

SIARA – Proving Suitability of R-Goose over a Packet Switched Wide Area Network for Future Wide Area Applications
P MOHAPATRA - GB, J KINCAID MACKENZIE - GB, G DUNCAN - GB, H GUO - GB, P BALASUBRAMANI - GB, K KULBHUSHAN - GB, A WILSON - GB, M WEHINGER - GB

Comprehensive Validation of Packet-Based Communications for Future Energy Systems

Measures to improve the reliability of IP networks for electric power systems aiming at operation efficiency and cost reduction
H. DOI - JP

PACS challenges for Packet Switched Networks
J. RAMIREZ - VE, J. CARDENAS - ES, J. RODRIGUEZ - ES

Application of MPLS-TP for Transporting Power System Protection Data

Telecommunications Network Modernisation in Utilities: Challenges of Migrating from Time Domain Multiplexing (TDM) Technology to Packet Switched Network (PSN)
P. TUAZON - AU, S. WITHANAGE - AU, V. TAN - AU

Verification and Validation of MPLS-TP for Tele-protection (Current Differential) services with existing TDM (SDH & PDH), Radio & WDM technologies through Proof of Concept

A Unified Communication Architecture for Smart Grid WAN/FAN/NAN Services
Y. SHI - CN

Migration to Packet Switched Networks in Iran National Grid Dispatching Center
V. VEYSI - IR

Development of IoT Sensor System for Monitoring/Diagnosis of the Power Distribution System

Migration to Hybrid MPLS-TP & SDH Communication System for a More Reliable Performance of the 500 kV System
C. DI PALMA - AR

Strategies for implementing teleprotection function over packet-switched networks
S. BULJORE - FR

Using IEC 61850 differential protection over Multiprotocol Label Switching – Transport Profile (MPLS-TP) wide area networks
M. KRANICH - CH