SC A1 ROTATING ELECTRICAL MACHINES

PS1: Developments in electrical machine design and experience in service

A1-101 Application of magnetic wedges for stator slots of hydrogenerators
Z. MILOJKOVIĆ, J. POLAK, J. ŠTUDIR, M. PETRINIĆ, Z. MALJKOVIĆ, D. BAN

A1-102 Development and production of the world’s largest capacity 2p-60 Hz-670 MVA and 4p-60 Hz-370 MVA hydrogen-cooled turbo-generators for a 60Hz-900 MW cross-compound thermal power plant
H. KATAYAMA, M. KAKIUCHI, D. MURATA, S. NAKAYAMA, H. NAKAMURA, H. ITO

A1-103 Field verification of multi-input PSS via reactive power input for damping low-frequency power swings
Y. KITAUCHI, H. MORITA, T. SHIRASAKI

A1-104 Voltage control for wind power plants. Real experience and results
E. FERNÁNDEZ, J.C. PÉREZ, C. COMBARROS, M.I. ROS

A1-105 Formaldehyde emissions in large rotating electrical machines root cause analysis, background and prevention
I. BERGMANN, R. DRAPER, F. RAMSAUER, G. LEMESCH

A1-106 Improvement of the voltage ride through capability of synchronous generators by excitation control
L. ROUCO, C. GINET, K. CHAN, K. MAYOR, O. MALCHER, L. DÍEZ-MAROTO, R. CHERKAOUI

A1-107 Integration of a novel permanent magnet synchronous generator to utility grids using voltage sourced converter technology
A. EDRIS, F. MCELVAIN, N. DANILOVIC, J. HELL, J. PINTER

A1-108 Experience in development and operation of new types of turbogenerators with vector type excitation system for wide-range reactive power control
YU.G. SHAKARYAN, I.A. LABUNET, P.V. SOKUR, T.V. PLOTNIKOVA, N.G. SHULGINOV, V.A. DIYACHKOV, YE.V. TIZLUKOVA, N.D. PICHUK, I.A. KADI-OGLI, Y. YE ZINAKOV

A1-109 Asynchronous generators as power systems’ natural dampers
K.R. ALLAYEV, G.M. FEDORENKO, V.I. POSTNIKOV, L.B. OSTAPCHUK

A1-201 Optical system for hydrogenerator monitoring
J.B. ROSOLEM, C. FLORIDIA, J. SANZ

A1-202 Turbine generator 760 MVA supervisory system
M.R. SINISCALCHI, C.L.M. PRATES

A1-203 Komati Unit 9 turbo-generator filter inspections after filtration runs
K.S. NAIDOO, Z.D. JIYANE

A1-204 Experience with continuous monitoring partial discharge testing in a predictive maintenance application of three similar hydro machines
A. TABERNERO, B. BATTLE, O. MARTÍNEZ, A. VILLARRUBIA, S. RODRÍGUEZ, E. NAHARRO

A1-205 Field experience in monitoring partial discharges in rotating machines
J.C. CANO, I. BLOKHINTSEV, E. PEREZ

A1-206 Detection of rotor winding shorted turns in turbine generators and hydrogenerators
S.R. CAMPBELL, J. KAPLER, M. SASIC, G.C. STONE

A1-207 Improvement and uprating of turbo generator of high DAM hydro power plant in Egypt
M. AWAD, A. ZEIT, D. FADL

PS2: Lifetime management
A1-208 Challenges to test in factory a turbogenerator for an EPR NPP project
P. COULON, M. LICHTENBERGER, V. FERNAGUT, H. DEBRUYNE, L. DAVID, O. NICOLAS, M. BERLAMONT

A1-209 Investigation of nonlinear and non-stationary motor current signature analysis methods for fault diagnosis in electrical drives
I.P. TSOUMAS, A.N. SAFACAS

A1-210 An in depth analysis of the generators of a critical hydroelectric power plant
E. ROBLES, R. CAMPÚZANO, O. DE LA TORRE, J. RAMÍREZ, F. FEREGRINO, J. GARCÍA

A1-211 Voltage endurance test over two different models of hydrogenerator stator bars due to different overhang configuration
S. RODRÍGUEZ, A. VILLARRUBIA

A1-212 Experience with partial discharge (PD) monitoring system for hydro generators
J. FUHR, F. JOLLIEF, M. SCHULZ, M. WESTRICK

A1-213 Inspection, repair and rewind experience on large, air-cooled, high voltage generators
W.G. MOORE, A. KHAZANO

A1-214 The risk of transformer fires and strategies which can be applied to reduce the risk
A. PETERSEN

A2-101 Power transformer tank rupture prevention
M. FOATA, J.B. DASTOUS

A2-102 Vibro-acoustic diagnostic: contributing to an optimized On-Load Tap Changer (OLTC) maintenance strategy
L. ALLARD, P. LORIN, M. FOATA, S. PRAJESCU, C. LANDRY, C. RAJOTTE

A2-103 New methodology for remanent life assessment of oil-immersed power transformers
W. FLORES, E. MOMBELLO, J. JARDINI, G. RATTÁ

A2-104 Relevance and importance of the carbon oxide gases and their ratio for the interpretation of dissolved gas analysis in transformers and tap changers
I. HÖHLEIN-ATANASOVA, R. FROTSCHER

A2-105 Advanced diagnostics of generator step-up transformers in Polish practice
M. KAZMIERSKI, W. OLECH, P. WARCZYNSKI

A2-106 Aged transformer maintenance and diagnostics using new methods with dissolved gas analysis in Japan
H. OKUBO, H. IMAGAWA, T. KOBAYASHI, T. SATO, Y. EBISAWA, Y. SHIRASAKA

A2-201 Ageing diagnosis by chemical markers - influence of core-type and shell-type technology
Y. DENOS, A. TANGUY, J. JALBERT, R. GILBERT, P. GERVAIS, P. GUINIC

A2-202 New approach of maintenance of power transformers and main accessories: off - line test vs. on - line monitoring systems
H. CAGO, E. PALAZUELOS, J.I. ANGUAS, S. QUINTIN, A. VILLARRUBIA, J.M. SAYOLS
**A2-210** New tool for fleet screening of shunt reactors  
B. HOLMGREN, K. CARRANDER, L. MELZER, T. OLSSON, L. PETTERSSON, C. BENGTSSON

**A2-211** The Swiss experience of on-site high voltage tests and diagnostic measurements on large power transformers  
T. HEIZMANN, T. ASCHWANDEN, J. FUHR, M. HÄSSIG, P. MÜLLER, R. BRÄUNLICH

**A2-212** Transformer life prediction using data from units removed from service and thermal modelling  
P. JARMAN, R. HOOTON, L. WALKER, Z. WANG, Q. ZHONG, T. ISHAK

**PS3: Transformer modelling**

**A2-301** Prediction of the oil flow and temperature distribution in power transformers by CFD  
S. TENBOHLEN, A. WEINLÄDER, R. WITTMAACK

**A2-302** Modelling and measurements of VFT properties of a transformer to GIS bushing  
K. JOHANSSON, U. GÄFVERT, G. ERIKSSON, L. JOHANSSON

**A2-303** Large generator step up transformers with low temperature hot spot for EDF nuclear power plants  
A. PRIETO, J. PORRERO, M. OLIVA, M. CUESTO, A. FERNANDEZ, A. JALINAT

**A2-304** Comparison of various approaches to transformer thermal modelling with direct temperature measurements  
O. ROIZMAN, V. DAVYDOV, W. GUO, A. PETERSEN, P. COLE

**A2-305** Optimization of transformer overload using advanced thermal modelling  
P. PICHÉ, F. TORRIANO, M. CHAABAN, S. GRAVEL, C. RAJOTTE, B. GIRAUD

**A2-306** Phenomena associated with switching capacitive currents in GIS substations and its effect on the winding of power transformer of a large power plant in Egypt  
M. AWAD, N. HEGGI, F. TAHON

**A2-307** Transformer loadability based on directly measured hot-spot temperature and loss and load current correction exponents  
H. NORDMAN, O. TAKALA

**A2-308** Determination of the stresses when energizing transformers: modelling of the electrical network and the transformer  
M. RIQUES, T. NGNEGUEU, F. DEVAUX, S. NGUEFEU

**A2-309** An insight into transformer winding response under the application of lightning impulse voltage  
C.C. ADALJA, M.L. JAIN

**A2-310** CFD analyses and experiments of a winding with zig-zag cooling duct for power transformer  
J.Y. LEE, S.W. LEE, J.H. WOO, I.S. HWANG

**SC A3 HIGH VOLTAGE EQUIPMENT**

**PS1: Development in HV equipment to cater for increasing system demands**

**A3-101** Application of modern technology to optimize switching of compensated lines  
T. JUNG, J.L. RAYON, F. ATT-ABDELMALEK, J. SAWADA, J. HOLLMAN

**A3-102** Travelling waves at line fault clearing and other transient phenomena  
A.L.J. JANSEN, D. DUFORNET

**A3-103** Cancelled - A diode based capacitor switch – a novel solution for power quality improvement  

**A3-104** Special requirements on surge arrester design for UHV A.C. systems above 800 kV system voltage  
R. GÖHLER, K.-H. WECK, V. HINRICHS, M. CLEMENS, M. SCHUBERT, M. TUCZEK, R. APPEL

**A3-105** 1200 kV transmission network and development status of 1200 kV technology in India  
V. RAMAKRISHNA, R.N. NAYAK, M.C. BHATNAGAR, B.N. DE BHOWMICK, R.K. TYAGI

**A3-106** Investigation of impact on short circuit current breaking condition in present high power transmission systems up to 500 kV  
K. IKEBE, Y. MAMETANI, T. SATO, J. KIDA, M. TOYODA, K. KAMEI

**A3-107** Very fast transient overvoltages during switching of bus-charging currents by 1100 kV disconnector  
U. RIECHERT, U. KRÜSS, D. SOLOGUREN-SANCHEZ

**PS2: Lifetime management of HV equipment**

**A3-201** Adequacy of the short-circuit capabilities of a high voltage circuit-breaker in the context in which it is used  
R.E. CAMPOY, M.R. CEBREIRO
A3-202 Improving system and equipment performance by controlled switching
A. CALAZANS, J.N. DE LIMA, N. VALENÇA, H.S. BRONZEADO

A3-203 Modelling the effect of maintenance on failure occurrence and lifetime management of high voltage circuit breakers
C. NEUMANN, B. RUSEK, C. SCHORN, S. FEDERLEIN, A. SCHNETTLER, G. BALZER, T. KRONTIRIS

A3-204 Extending the residual lifetime of 50 kV minimum oil circuit breakers through collaboration among utilities and industry in the Netherlands
T.G.M. VAN RIJN, F.S.W. DE VRIES

A3-205 An evaluation of the technical condition of the ageing electric equipment of power networks 110 – 750 kV in Russia. Making a decision about its further operation

A3-206 Reliability modelling of aged circuit-breakers using data from the design process
T. LINDQUIST, U. ÅKESSON, C.E. SÖLVER

A3-207 Field measurements and modelling of high frequency transients during disconnect switch operations in EHV Substations. Assessment of their effects on current transformers
M.D. DEL POZO, D.A. ESTEBAN, P.E. ISSOURIBEHIRE, G.A. BARBERA, A. FUNES, A. LEDESEMA

A3-208 Experience of Egypt in management of ageing of high voltage substation equipment
E. ELSHARKAWI, H. SAID, A. RAAFAT, S. ELREFAEI, D. ELAROUSI, M. BASYOUNI

A3-209 Switching overvoltage during disconnection of 765 kV reactor at substation La Arenosa in Venezuelan system
A. VILLA

PS3: Prospects for introduction of new HV technologies

A3-301 Use of optical instrument transformers for high-voltage testing
F. RAHMATIAN, D.F. PEELO

A3-302 New grading capacitor principle for high voltage circuit breaker
G. GAUDART

A3-303 Present status of high voltage vacuum circuit-breaker application and its technology in Japan
K. IKEBE, H. IMAGAWA, T. SATO, H. ITO, M. KOSAKADA, H. SAITO

A3-304 Resistance to vapour permeation of factory new and of mechanically stressed composite hollow insulators

A3-305 Short-circuit current limiter for electric network based on the magnetic-coupled reactor and fast-operating switch

A3-306 Hybrid fault current limiter interaction with MV line differential protection
J.M. ANICETO, K. KALTENEGGER, H.G. SUN

A3-307 Towards a guide for testing emerging fault current limiters
M. STEUER, B. MARCHIONINI, F. DARMAN, F. LAMBERT, M. NOE

A3-308 The challenge of SF6 gasless type switchgear for distribution and transmission voltage class in KOREA

A3-309 Testing of vacuum circuit breakers for transmission voltage and for generator current ratings
R.P.P. SMEETS, S. KUIVENHOVEN, L.H. TE PASKE

A3-310 Design and construction of a Rogowski coil and a resistive shunt for detection and measurement of current impulse
C. ROJO

SC B1 INSULATED CABLES

PS1: Technical challenges that have been overcome in newly installed underground and submarine cable systems

B1-101 Dynamic Rating of Transmission Cables

B1-102 The new technologies for replacement and uprating of EHV cable lines in Japan
S. TSUCHIYA, T. KIGUCHI, M. NISHIUCHI, S. KATAKAI, T. NAKAJIMA, M. OWASHI
B1-103 Experiences in manufacturing, testing, installing and operating of 500 kV cable systems including temperature sensing and PD monitoring
A. AVILA, R. VOGELSANG

B1-104 HVAC submarine cable links between Italy and Malta. Feasibility of the project and system electrical design studies
L. COLLA, M. GABRIELI, A. ILICETO, M. REBOLINI, B. ZECCA, P. GRIMA, J. VASSALLO, S. LAURIA, A. VENTICINI

B1-105 200 kV DC extruded cables crossing the San Francisco Bay
M. BACCHINI, R. GRAMPA, M. MARELLI, T. WESTERWELLER, D. PARQUET, S WEHN, D. LORDEN

B1-106 NorNed - world’s longest power cable
J.E. SKOG, H. VAN ASTEN, T. WORZYK, T. ANDERSHROD

B1-107 HV AC power transmission to the Gjøa platform
M. JEROENSE, M. LARSSON-HOFFSTEIN, C. SONNESSON, R.O. RÅD

B1-108 Transition joints for connection of AC fluid filled to extruded cables from 33 kV to 400 Kv
J.G. HEAD, R. LEWIS, D. QUAGGIA, H. GEENE, F. WAITE

B1-109 Re-empowerment of 132 kV OF cables - Situation analysis
A. VILLAFANE, L. BEITONE, A. MEDAGLIA, I. RUIZ

B1-110 Statistic of failures on underground high voltage power cables in Brazil

B1-111 A novel method of restoring BTC 525 kV submarine cable following a catastrophic breakage of a termination at a cable landing site
T. KOJIMA, S. CHERUKUPALLI, C. MCHIRTER

B1-112 Insulation state analysis and upgrading feasibility study of existing AC 10 kV XLPE distribution cables in Jiangsu Grid of China
X. CAO, Y. XU, Y. LIU, J. LIU, Z. ZHANG, Y. FEI

B1-113 Implementation and operation of a cable monitoring system in order to increase the ampacity of a 220 kV underground power cable
M. SCHMALE, H.J. DRAGER, R. PUFFER

B1-114 Development of the HVDC ± 250 kV MI submarine cable system in KOREA

B1-115 Submarine cables to 34.5 Kv of the Carmen Beach to the Cozumel Island in Mexico. Corrosion specification and operative experiences
H.A. FLORES

B1-116 Power loss and inductance of steel armoured multi-core cables: comparison of IEC values with “2.5D” FEA results and measurements
J.J. BREMNES, G. EVENSET, R. STOLAN

B1-117 Cancelled - New in land cable installation

B1-118 Fixing arrangements and accessories for flexibly installed HV cable systems in underground cable tunnels
A.W. BOOTH, A. HANEKOM

PS2: Key factors in current and foreseen development of cable systems

B1-201 Minimising the impact on water resources when making, installing and operating an underground high voltage cable system
P. MIREBEAU, M. MAMMERI, L. BÉNARD

B1-202 Study of direct burial of high voltage underground cables
P. HONDAA, N. BOUDINET, X. BOURGEAT, C. MOREAU

B1-203 Assessment and technical trends in high reliability XLPE cable accessories for transmission lines in Japan
S. TSUCHIYA, S. UMEDA, S. NISHIKAWA, T. KIGUCHI, S. GOTOH, G. OKAMOTO

B1-204 Upgrading of existing 400 kV FF HV cable link by redesigning and implementing forced cooling apparatuses in Vienna
G. SVEJDA, J. VAVRA, M. WANDE, R. GASPAR, M. BECHIS

PS3: State-of-the-art and trends for cable system testing

B1-301 Full-scale test on a 100 km, 150 kV AC Cable
F. FARIA DA SILVA, W. WIECHOWSKI, C. LETH BAK, U. STELLA GUDMUNSDOTTIR
A new concept for test equipment for testing large HV and UHV cables on-site
P. MOHaupt, A. BERGMAN

Experience of withstand testing of cable systems in the USA

On-site commissioning test and diagnostics of 220 kV XLPE cable system
M.M. AWAD, F. TAHOUN, A. EL FARASKOURY, O.E. GOUDA

Use of on-line UWB PD techniques to evaluate a 161 kV underground cable after repetitive joint failures
V.R. GARCIA-COLON

Partial discharge monitoring system for high voltage cables
F. GARNACHO, M.A. SANCHEZ URAN, J. ORTEGO, J. MORENO, F. ALVAREZ, J.L. VALLEJO, B. LOSADA, J. GONZALO

SC B2 OVERHEAD LINES

Managing the environmental impact of new and existing overhead transmission lines

Managing the environmental impact when uprating an existing OHTL: sharing of a Belgian experience with the installation of ACCC
J-F. GOFFINET, S. GERMAIN, J. HOEFFELMAN, B. PELSSERS, B. RISSE

Urban overhead transmission lines of compact design for 69,138 and 230 Kv
J.N. HOFFMANN, R.W. WIEDMER, M.J. BUBNIAK, I.S. MOREIRA

Composite based overhead line systems - Reducing the visual impact of overhead lines
T.K. SOERENSEN, I. HOLBOELL, G. KYED

Conception of a 400 kV overhead line "sustainable development"
F. SAUVEGRAIN

Effective land use with special towers for increasing transmission capacity and raising the tower height
K. SUZUKI, S. ROKUTANDA, S. ITODA

400 kV compact lattice structure tower designed in DUBAI in the restricted corridors. Effects of electric and magnetic fields
S. AL IALLAF, J. GEORGE, G. GHEORGHITA, E. DRAGAN, D. MARGINAN

Overhead line in protected floodplain woodland „Extended Ecology“ as basis for OHL planning and maintenance
A. HAGEN, F. LENGLACHNER, S. ABERLE, H. MINICHBERGER, H. LUGSCHITZ

Performance of HVDC transmission lines in Brazil - analysis of field data and calculation methods
L.A.M.C. DOMINGUES, J.I. SILVA FILHO, V.H. ANDRADE, F.C. DART, A. MPALANTINOS NETO

Audible noise levels of transmission overhead lines standard configurations EHV (Extra High Voltage) operated in the Czech Republic and Slovak Republic
J. ŠVEC, J. TLUSTÝ, J. LAGO, P. BOJDA

Use of reduced visual impact designs on 220 kV and 400 kV overhead lines in Ireland and their integration into the landscape
J. DOYLE, C. Ô LAIN, K. COFFEEY

EMF mitigation characteristics of 154 kV compact transmission tower using insulation arms

Development of a compact bipole 380 kV overhead line
J.F. VAN WOLVEN, A.J.P. VAN DER WEKKEN, H.E. HOEKSTRA

Potential reduction of audible noise from new and aged overhead transmission line conductors by increasing their hydrophilicity
U. STRAUMANN, H.J. WEBER

PS2: Increasing the power capacity of existing overhead lines by conversion of AC to DC or by increasing the voltage level

Analysis of the possible conversion of overhead electrical lines from AC to DC
L. COLLÀ, S. MALGAROTTO, M. REBOLINI, U. ZANETTA

Upgrade transmission line corridor Portile de Fier – Resita – Timisoara – Arad by transforming existing double circuit lines
G. VISAN, L. IACOBICI, I. ARDELEAN, S. WECHSLER, D. MARGINEAN, A. COPOIU, L. OPREA

Technical and economic incentives for AC to DC line conversion
L.O. BARTHOLD, R. ADAPA, D. WOODFORD
B2-204 Experimental flashover research on switching impulse of 750 kV single circuit compact transmission line tower
Y.C. YUAN, L. LIU, J.Y. GUO, C. DENG

B2-205 Design and testing of overhead lines supporting structures in view of the highest demands regarding compaction, AC/DC upgrade and uprating
R. STEPHEN, J. DIEZ-SERRANO, Q. CAI, D. MUFTIC, S. DIMOV

PS3: Assessment of overall electrical and mechanical availability of OHL

B2-301 Cancelled - An innovative strategy to prevent cascading failures of existing overhead transmission lines

B2-302 Structural analysis for transmission latticed steel tower in the 400 kV transmission lines El Tablazo – Cuatricentenario No. 1 and 2
C.J. GARCÍA-ALAMO, J. PALACIOS

B2-303 Impact of turbulence on vortex induced vibrations and fatigue of conductors: modelling and real span experimentation
G. DIANA, M. BELLOLI, A. MANENTI, S. MUZZIASCA, P. BOUSSEAU, S. GUGLIELMINI

B2-304 Numerical modelling of a transmission line cascade with a load reduction device (LRD)
A. HALDAR, M. VEITCH, T. ANDREWS, K. TUCKER

B2-305 Robotics applied to power line inspection and maintenance: Hydro-Quebec’s experience and future applications
S. MONTAMBault, N. POULIOT, R. DANSEREAU

B2-306 The life extension policy of overhead lines
P. GRAND

B2-307 Investigation of electrical tree characteristics developed in composite insulation using color coding techniques
M.H. ABDERRAZZAQ

B2-308 Methods of use of climatic conditions data for assessing climatic loads for OHL
V.A. LUGOVOI, S.V. CHERESHNYUK, L.V. TIMASHOVA

B2-309 Assessment of OHL availability and residual life-time by using non destructive instrumental control for conductors, steel wires and guys
V. VOLOKHOVSKY, A. VORONTSOV, D. SUKHORUKOV, B. MEKHANOSHIN, V. SHKAPTSOV

SC B3 SUBSTATIONS

PS1: New techniques/New design of substations

B3-101 Development of an 800 kV HVDC station post design based on the long-term experience with composite line post insulators
C. ARMSCHAT, J.C. STANKEWITZ, K.O. PAPAILIOU, S. THADDEY, F. SCHMUCK

B3-102 1200 kV AC products and substations: requirements, design and performance experience
R. GOEHLER, D. HELBIG, L-R. JAENICKE, E. KYNAST, G. LINGNER, B. RAETH, J. SCHMID, G. SRINIVAS

B3-103 Optimized gas insulated lines for bulk power transmission
M. BERNARD, A. GIRODET, F. BIQUEZ, E. LARUELLE, J-L. RAYON, J-F. PENNING, A. FICHEUX, A. BERTINATO

B3-104 Pilot installation of a 380 kV directly buried gas insulated line (GIL)
C. NEUMANN, I. JÜRGENS, J. ALTER, S. PÖHLER

B3-105 Megacity underground substation technical requirements and implementation experiences
H. NAKAJIMA, T. SATO, T. WATANABE, K. SASAMORI, T. YOKOTA, M. ONO

PS2: Existing substations, new challenges

B3-201 Issues embedding series compensation in Chilean Central Interconnected System (SIC)
J. VARGAS, L. VASQUEZ

B3-202 Management of current and voltage limits in RTE’s substations
A. PARISOT

B3-203 New selection and separation system for a very fast recovery into service of a 380 kV Italian aerial-cable line
C. SABELLI, L. CACIOLLI, G. BRUNO, M. GENsINI, A. MONTELATICI

B3-204 Application of technologies for uprating and upgrading of substations in Japan
H. IMAGAWA, T. KOBAYASHI, T. SATO, K. UEHARA, K. SASAMORI, A. OKADA
B3-205 Environmental analysis of different technologies for a Swiss high-voltage substation
C. LINDNER, L. TREIER, F. MEYER, K. POHLINK, T. DARDEL, Y. KIEFFEL, I. HUET

B3-206 Experimental investigations to the joint resistance of bolted substation and transmission line connectors and its conformity review to test standards
L. BILY, C. HILDMANN, S. GROSSMANN, G. MOUSTAFA, R. KLEVEBORN, L. CHARLSHEM

B3-207 Evaluation of old substations porcelain insulators in service: input for risk assessment and replacement options
I. GUTMAN, J. LUNDENGARD, L. WALLIN, A. MJELVE, T. OHNSTAD

B3-208 Cancelled - ISCM, integrated substation condition monitoring.

B3-209 Real time system for detection and location of partial discharges in substations
J.E. SALCEDO, W.J. FERRANDIZ, E. HOLLMAN, A. IOZZIA

B3-210 Thermal-resistant aluminium-alloy conductor: an alternative for bus uprating of substations
F.N. FRAGA, B.A. NASCIMENTO, R.L.S. VELOSO, R.O. MELO, A.V. GODOY

B3-211 Planning for continuity of reliable power supply to Mumbai mega city
A. RAJE, D. RAINA, P. MURUGAN

B3-212 Performance evaluation of insulator creepage extender at heavy magnetite polluted 230 kV substation
M. REZAEI, M. OSKOUEE, M. SHARIATI, S. AGAH, A.S. DEZFULI

B3-213 Upgrading of the short-circuit power of a 380 kV substation: problems to cope and possible solutions in a unified context
E. CARLINI, M.L. CROCIANI, D. FALORNI, A. FREDDO, V. IULIANI, E. COLOMBO, G. PUCCI

B3-214 Application of new asset management methods to sub-transmission networks in Mexico
M. SCHWAN, M. ESQUIVEL, C. NABTE, S. SÁNCHEZ, E. ARROYO

B3-215 GIS substation maintenance combined with uprating
A.V. MAYOROV, V.I. ROGOV, L.J. SHUR, G.M. VERULIDZE, I.V. BABKIN, A.S. PELTS

PS3: New secondary system challenges in substations

B3-301 “Smart Switchgear” using IEC Standard 61850 - First experience gained with a pilot project in a 380/110 kV substation

B3-302 Intelligent compact substation of power distribution
J.M. BYEON, J.G. LEE, S.W. LEE

B3-303 A practical approach to verification and maintenance procedures for IEC 61850 substations
N. ETHERDEN, G. KIMSTEN, V. TIESMÄKI

B3-304 Case study : implementation of IEC 61850 in Java-Bali transmission system
T. FERMI, E. NOVRIZAL

B3-305 Innovative revenue metering with existing instrument transformers to enable new metering challenges
M. VAN RIET, F. BALDINGER, O. MANSOUR, H. LENTING, F. VOLBERDA, G. RIETVELD

B3-306 Impact of the IEC 61850 process bus on substation design
A. APOSTOLOV

PS3: New secondary system challenges in substations

PS1: Developments in HVDC and FACTS technology

B4-101 Trans bay cable – world’s first HVDC system using multilevel voltage-sourced converter
T. WESTERWELLER, K. FRIEDRICH, U. ARMONIES, A. ORINI, D. PARQUET, S. WEHN

B4-102 The Xiangjiaba-Shanghai 800 kV UHVDC project - Status and special aspects
V.F. LESCALE, U. ÅSTRÖM, W. MA, Z. LIU

B4-103 Concept to design – Multi-terminal at 800 kV HVDC: NER/ER – NR/WR interconnector - I project in India
A. KUMAR, V.F. LESCALE, L-E. JUHLIN, R.K. CHAUHAN

B4-104 Characteristics and benefits of modular multilevel converters for FACTS
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SC C6 DISTRIBUTION SYSTEMS AND DISPERSED GENERATION

PS1: Planning and operation of distribution networks incorporating dispersed energy resources (DER) and renewables

C6-101 New automation functions under development to enable French distribution networks to integrate efficiently large share of Dispersed Energy Resources (DER) and Renewable Energy Sources (RES)
S. GRENARD, O. DEVAUX, J. MAIRE

C6-102 The IPES project: a new challenge for RTE to integrate wind generation into the French power system
M. MASSON, J-P. CONTANT, G. VINCENT, R. LOPEZ

C6-103 A multi-objective approach to investigate active distribution network impact on the contrasting goals of the distribution system stakeholders
G. CELLI, F. PILO, G.G. SOMA, M. GALLANTI, R. CICORIA

C6-104 Evaluation of power supply quantity in microgrid islanded operation with demand side control method
T. SHINJI, S. TAGAMI

C6-105 Towards the wide implementation of standards IEC 61968/70 (CIM) and IEC 61850 in the distribution system
Z. STYCZYNISKI, M. GURBIEL, H. RIIS, ZITA A. VALE, A.M. GELFAND, V.V. KOSENKO, B. BUCHHOLZ, G. LANG, J. BLUMSCHEIN
C6-106 Cancelled - A fast-switching load for frequency stability

C6-107 Improving network reliability by minimising the impact of renewable energy uncertainties
K. ZOU, A.P. AGALGAONKAR, K.M. MUTTAQI, S. PERERA, A. BAITCH

C6-108 Active distribution network equipment research and testing on a full scale distribution network test line
C. ABBEY, Y. BRISSETTE, L. DIGNARD, G. JOOS

C6-109 Reactive power control with CHP plants - A demonstration
P. NYENG, J. ÖSTERGAARD, C.A. ANDERSEN, J. DALL, C. STRUNGE

C6-110 Development of new islanding detectors and voltage control systems by experimental studies supported by NEDO
S. MOROZUMI, K. WATANABE, K. YOSHIDA, K. KOUCHI, Y. NAKANISHI, H. OTA

C6-111 Operating experiences and voltage control issues in distribution network with large scale integration of both wind and small-scale hydro power generation
T. TOFTEVAAG, T. SOLVANG

C6-112 Joint action of DG units to reduce flow of reactive power in the distribution network
A.G. ENDEGNANEW, A. PETTERTEIG

C6-113 Functional model of virtual power plant (VPP)
S. LUKOVIC, I. KAITOVIC, M. MURA, U. BONDI, F. KULIC, D. POPOVIC

C6-114 Experiences of introducing new regulatory policies to electricity supply industry of Thailand
P. PUNJAD, R. MUENYA

C6-115 Smart grid demos provide guidance on integrating DER and RES into the distribution system with consideration of transmission impacts, market signals, and technologies
M. WAKEFIELD, G. HORST, S. HAMILTON, M. SMITH, J. KUECK

C6-116 Provision of ancillary services by RES
B.M. BUCHHOLZ, V. BÜHNER

PS2: Demand side integration

C6-201 Practical experiences of demand side integration through pricing
B. FENN, D. ERMERT, H. FREY

C6-202 Optimal demand side response for electricity balance control in microgrid
M. KOSHIIO, M. NONAKA, S. NAKAMURA, K. NAKAO, D. SATO

C6-203 Active demand side management operator tool (SGCLOS) and new communications architecture in the XXI century electrical grid

C6-204 Prospective study on the impact of electrical vehicles on the winter load peak in a village of East of France
C. BATHANY, H. BOULI, V. MURIN, D. OSSEO, J. MAIRE, M. SARR

C6-205 Integration of active customers into smartgrids: experimental test facility and results
G. MAURI, D. MONETA, J. SILVA DE ASSIS CARNEIRO, S. PUGLIESE, S. FRATTI

C6-206 DSM in Spain, GAD project. Aims, developments and initial results
I. NAVALON, S. BANARES, L. MORENO, A. QUIJANO

PS3: New concepts and technologies for the electrification of rural and remote areas

C6-301 Unified power quality controller for the micro grid system
Y.H. CHUNG, H.I. JI, J.W. CHOE

C6-302 New technology for the development of economic and sustainable rural electrification systems in the vicinity of EHV power lines
L.E. MELO, J.C. PITMAN, A. CASSINOTTI, G. CASSINOTTI, R.P. ROUCA

C6-303 Secondary control of microgrids: application of potential functions
A. MEHRIZI-SANI, R. IRAVANI

C6-304 Distributed intelligent control of DER and LV loads in microgrids
A. DIMEAS, N. HATZIARGYRIOU, V. LIOLIOU, K. TSIOULIS, P. MOUTIS, S. CHADJIVASSILIADIS, E. KARFOPOULOS, T. TOMTSI, T. TSELEPI, E. RIKOS

C6-305 Rural electrification project development, using auxiliary service voltage transformers. Location of Tubares, Chihuahua, Mexico
R. GOMEZ, A. SOLANO, E. ACOSTA
C6-306 European roadmap for microgrids
C. SCHWAEGERL, L. TAO, P. MANCARELLA, G. STRBAC, N. HATZIARGYRIOU, B. BUCHHOLZ

C6-307 Small-scale rural electricity providers - opportunities and challenges
A.N. ZOMERS, C.T. GAUNT ON BEHALF OF SC C6

**SC D1 MATERIALS AND EMERGING TEST TECHNIQUES**

**PS1: New materials for improved efficiency and sustainability of AC & DC power equipment**

D1-101 Experience of the Egyptian electricity transmission company in up-rating existing extra high voltage overhead transmission lines
H. NEG, N. HEGGY, A.S. IBRAHIM, L. AHMED, S. TAWFIK

D1-102 Comparison between mineral and ester oils
C. PERRIER, M. RYAD, Y. BERTRAND, C. TRAN DUY

D1-103 Application of new solid insulating materials and gases to future advanced gas insulated systems
H. HAMA, S. OKABE, T. ROKUNOHE, H. OKUBO, M. NAGAO

D1-104 Experimental research on the feasibility of biodegradable polymeric insulating materials
Y. OHKI, N. HIRAI, S. KANEKO, S. OKABE

**D1-105 Improved performance of silicone rubbers for the use in composite insulators**
S. ANSORGE, F. SCHMUCK, S. AITKEN, K.O. PAPAILIOU

**D1-106 Evaluation of conductivities and dielectric properties for highly stressed HVDC insulating materials**

**PS2: Challenges for testing and diagnostics**

D1-201 Flashover tests under wet conditions on full and section UHV insulators
O. OLIVEIRA FILHO, D.R. MELLO, J.A. CARDOSO, R.M. DE AZEVEDO, S.G. CARVALHO, W.A.S. CRUZ

D1-202 New approach of testing power transformers by means of static frequency converters
A. THIEDE, T. STEINER, R. PIETSCH

D1-203 A novel optical fiber sensor system for temperature monitoring of power transformers

D1-204 PD pattern classification system using image analysis for on-line PD monitoring of power equipment
V.R. GARCIA-COLON

D1-205 Condition assessment of transmission power cables

D1-206 Pulsed X-ray induced partial discharge measurements – a new testing technique for HV insulation
H. FUHRMANN, A. TROGER, U. RIECHERT

D1-207 Combination of different techniques for improved interpretation of PD measurements
S. TENBOHLEN, A. PFIFFER, S. COENEN, A. WILSON, S. MARKALOUS

D1-208 Partial discharge and dissolved gas analysis of common fault types in bio-degradable oil transformers
B.T. PHUNG, N.A. MUHAMAD, T.R. BLACKBURN

D1-209 Challenges in obtaining asset management and diagnostic monitoring information from network businesses in a commercial world
P. MCMULLAN, P. RAMSAY

D1-210 Belgian experience with electrical testing and destructive material analysis for improved stator winding insulation diagnostics
J. VAN COITHEM, G. PLATBROOD

D1-211 Furan derivatives in oil: assessment of the deterioration of winding insulation of a hermetically sealed power transformer. New results
J. NEJEDLY, H. HALBWIRTH

D1-212 Return of experience on UHF partial discharge monitoring of a high voltage substation
A. GIRODET, G. LUNA, S. DUBOSCO, P. PRIEUR

D1-213 Diagnostic markers for oxidation condition of mineral oil and ester insulating fluids
I. ATANASOVA-HOEHLLEIN, T. HAMMER, M. SCHAEFER

D1-214 A development of diagnosis system employable to high voltage insulator considering leakage current
C.H. RYU, J.Y. KOO, B.W. LEE
D1-215 Experiences on commissioning, failure analysis and on-line testing of gas insulated substations
C.G. AZCARRAGA, A. GARCIA, A. NASA, O. ESCORSA

D1-216 Interpretation of dielectric spectroscopy results in time and frequency domains for power cables
S. BHUMIWIAT

D1-217 Compact system for induced overvoltage tests in complete substations
E. IRABURU, E. PEREZ, F. GARNACHO, P. SIMON, T. GARCIA

PS3: Endurance of materials especially in harsh electrical and physical environments

D1-301 Deterioration of fiber reinforced material under chemical and coastal pollutions
N. HEGGY, B.A. ARAFA, M. SAMIR

D1-302 Endurance of polymeric insulating materials in nuclear power plants and needs for condition monitoring of electrical cables
Y. OHKI, N. HIRAI, T. YAMAMOTO, T. SEGUCHI, H. KUDOH, T. OKAMOTO

SC D2 INFORMATION SYSTEMS AND TELECOMMUNICATION

PS1: Practical implementation of IEC 61850 in electric power systems (Common with B5)

D2/B5-101 Multipurpose architecture model of phasor data concentrator
I. IVANKOVIC, S. SKOK, R. MATICA, I. STURLIČ

D2/B5-102 BHEL experience in implementation of IEC 61850 based substation automation system in India
A. SINHA, R. SINGH, G. CHAKLADER, D. DATTA

D2/B5-103 Practical experience with IEC 61850 multivendor systems and foreseeable future applications – a system integrator and end-user perspective
R. PAULO, F. MATOS

D2/B5-104 Performance considerations in wide area monitoring and control systems
M. CHENE, L. NORDSTRÖM

D2/B5-105 Communication between substation with 61850 technology and control centre
C. BRUNER, W. BRODT, H. ENGLERT, K. RIEN, A. WEST, P. L'HUIILLIER

D2/B5-106 Impact of communication network impairments on wide area monitoring, control and protection applications in the IEC 61850 environment
E. GOUTARD, T. RUDOLPH, M. MESBAH

D2/B5-107 Specifications, requirements and experiences using IEC 61850 in the Iberoamerican region
C. SAMITIER, R. PELLIZZONI ON BEHALF OF RIAC JWG 61850

D2/B5-108 Communication issues using line protection schemes
C. SAMITIER ON BEHALF OF CIGRE JWG B5/D2.30

D2/B5-109 PRIME as open communication base for IEC 61850 on the distribution network
J. ARRIOLA, L. ANDERSSON, T. BERNSTEIN

D2/B5-110 Architecture of wide area monitoring systems and their communication requirements
V. TERZIJA, D. CAI, A. VACCARO, J. FITCH

D2/B5-111 Virtual Busbar Protection Implemented with IEDs IEC 61850 from different vendors in a 132/33/13.2 kV substation
R. PELLIZZONI, L. FUNES, R. DELORENZI, E. DUFOR, P. D'AMORE, I. STEINBRECHER, F. FERNANDEZ, E. SCHHAVINO

D2/B5-112 Utility experience and future expectation from substation automation system based on IEC 61850
I.S. JHA, O. CHANDY, K. RATHORE, R. SRIVASTAVA

D2/B5-113 Communications needs for different applications of IPS/UPS wide area measurements (WAMS)
B. AYUEV, P. EROKHINE, Y. KULIKOV

D2/B5-114 Ethernet network performance analysis and RSTP protocol behaviour in a complex topology proposed by Endesa for IEC 61850 substations
A. ARZUAGA, M. ZAMALLOA, B. GALLASTEGI, T. ARZUAGA, J. BADIA, R. MARTIN, A. HILAZO

D2/B5-115 Engineering approach for the end user in IEC 61850 applications
N. NIBBIO, M. GENIER, C. BRUNNER, E. COTTENS, D. MULLER, J. REUTER

D2/B5-116 Deployment and interconnection of IEC 61850 substations
K.P. BRAND, I. DE MESMAEKER, H. SPIESS, P. SCHWYTER, W. WIMMER

PS2: Information and information technology (IT) security for electric power utilities

D2-201 A telecommunications mobile unit for transmission lines emergency scenarios
A. PINHEL SOARES, R. MEDEIROS, J.A. PAULA MOTA
D2-202  Security improvement for office systems in Japan electric power companies
H. IWAMOTO, H. MISHIMA, A. FUTAKATA, Y. TOMITA, H. HAZAKI

D2-203  Outline of telecommunications networks for electric power systems and their security measures with evaluation examples in Japan electric power companies
H. OZOU, K. YAMAOKA, M. KIUCHI, K. DEZAKI, H. SHIMADA

D2-204  Design of a physical and logical secure IP telecommunication network architecture in the Spanish TSO Red Eléctrica de España
J.R. FEIJOO MARTINEZ, M. CÁRDENES, J. ÁLVAREZ, J.A. GARCÍA LÓPEZ, J.J. ROMERA VALERO

D2-205  Identifying cyber security events in IEC 61850 substations by analysing different traffic patterns
T. ARZUAGA, R. URIBEETXEBERRIA, I. ARENAZA, I. GARITANO

D2-206  Information security for electric power utilities – results of Cigré WG D2.22
G. ERICSSON, Å. TORKILSENG, G. DONDOSSOLA, M. TRITSCHLER, L. PIETRE-CAMBACEDES

D2-207  Implementation of security management system in period of SCADA/AGC/EMS refurbishment in Croatian TSO
N. BARANOVIC, A. CERNICKI MIJIC, J. BUJAK

D2-208  Impact of cyber-security requirements on the substation process control
D. GIARRATANO, H. ECKHARD

D2-209  Reducing the obscurity in cyber security - trends, challenges and advances in Brazil
E.B. BANDEIRA DE MELO

D2-210  Strategies regarding the IT security and vulnerability of automation systems
I. MERFU, S. MARINESCU, S. NICULESCU

D2-211  A case study applying the cyber security modelling language
T. SOMMESTAD, M. EKSTEDT, L. NORDSTRÖM

D2-212  IEC 61850, tools and cyber-security. A perfect mix or a recipe for disaster?
S. THOMPSON