



2010 CIGRE SESSION

TECHNICAL PROGRAMME

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. LABUNETS, P.V. SOKUR, T.V. PLOTNIKOVA, N.G. SHULGINOV, V.A. DIYACHKOV, YE.V. TUZLUKOVA, N.D. PINCHUK, I.A. KADI-OGLI, V.YE ZINAKOV
- A1-109** *Asynchronous generators as power systems' natural dampers*
K.R. ALLAYEV, G.M. FEDORENKO, V.I. POSTNIKOV, L.B. OSTAPCHUK

PS2: Lifetime management

- 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. BATLLE, 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

- 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. CAMPUZANO, O. DE LA TORRE, J. RAMIREZ, F. FERREGRINO, J. GARCIA
- 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. JOLLIET, M. SCHULZ, M. WESTRICK
- A1-213** **Inspection, repair and rewind experience on large, air-cooled, high voltage generators**
W.G. MOORE, A. KHAZANOV

SC A2 TRANSFORMERS

PS1: Transformer incidents in service

- A2-101** **The risk of transformer fires and strategies which can be applied to reduce the risk**
A. PETERSEN
- A2-102** **Power transformer tank rupture prevention**
M. FOATA, J.B. DASTOUS
- A2-103** **Tank rupture prevention technology for a large power transformer**
J.Y. LEE, J.K. HAM, J.C. YANG, J.K. LEE
- A2-104** **HV bushing failure in service, diagnostics and modelling of oil-type bushings**
J. WANKOWICZ, J. BIELECKI, M. SZROT, J. SUBOCZ, R. MALEWSKI
- A2-105** **Transformer fire mitigation and oil spill containment - strategies developed from experience**
E. LAMPLOUGH, T. GRAY, L. SMYTH
- A2-106** **A new approach to design of oil-filled transformers with high fire and explosion safety**
L.A. DARIAN, Y.A. DEMENTYEV, V.P. EFREMOV, A.V. SHURUPOV, A.V. KOZLOV, V.P. POLISCHOOK, V.E. FORTOV, M.F. IVANOV, A.D. KIVERIN, E.M. APFELBAUM, V.S. IORISH, K.V. KHISHCHENKO
- A2-107** **Detailed performance of a 50 MVA transformer filled with a natural ester fluid versus mineral oil**
R. GIRGIS, M. BERNESJO, G.K. FRIMPONG

PS2: Transformer life

- 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** **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
- A2-203** **New methodology for remanent life assessment of oil-immersed power transformers**
W. FLORES, E. MOMBELLO, J. JARDINI, G. RATTÁ
- A2-204** **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
- A2-205** **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
- A2-206** **Experiences with wireless transformer monitoring system installed by the manufacturer and operated at strategically important locations of the Mexican grid**
A. CANCINO, R. OCÓN, G. ENRÍQUEZ, M.E.G. ALVES, R. MALEWSKI
- A2-207** **Experiences with procuring a 220/16/16 kV 225 MVA generator transformer**
J.H.L. HENDRIKS
- A2-208** **Advanced diagnostics of generator step-up transformers in Polish practice**
M. KAZMIERSKI, W. OLECH, P. WARCZYNSKI
- A2-209** **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. WITTMACK
- 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. PICHER, F. TORRIANO, M. CHAABAN, S. GRAVEL, C. RAJOTTE, B. GIRARD
- 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. RIOUAL, 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. AIT-ABDELMALEK, J. SAWADA, J. HOLLMAN
- A3-102** ***Travelling waves at line fault clearing and other transient phenomena***
A.L.J. JANSSEN, D. DUFOURNET
- 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. HINRICHSEN, 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 disconnectors***
U. RIECHERT, U. KRÜSI, 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 electric power networks 110 – 750 kV in Russia. Making a decision about its further operation*
V.S. BOGOMOLOV, E.N. EFIMOV, A.S. HLYZOV, Y.N. LVOV, I.L. SHLEIFMAN, L.V. TIMASHOVA, N.V. YASINSKAYA, I.A. NAZAROV, S.Y. BATYAEV
- 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. ISSOURIBEHRE, 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*
V. HINRICHSSEN, N. MÖHRING, T. WIETOSKA, H. HAUPT, A. BOCKENHEIMER, C. HEINEMANN, C. BERGER, I. GOTTSCHALK, N. KURDA, N. MIKLI, F. SCHMUCK, J. SEIFERT
- A3-305** *Short-circuit current limiter for electric network based on the magnetic-coupled reactor and fast-operating switch*
Y.G. SHAKARIAN, N.L. NOVIKOV, V.S. CHUPRIKOV, A.V. MALYSHEV, V.M. BATENIN, A.S. VESELOVSKY, A.V. KOZLOV, S.I. KOPYLOV, V.E. FORTOV, A.V. SHURUPOV, M.O. RAYCHENKO, S.V. UKOLOV
- 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. STEURER, 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*
J.S. RYU, Y.K. KIM, S.J. TAK, S.W. PARK, J.B. KIM, C.W. PARK, M.S. KIM, W.P. SONG
- 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*
E. JACOBSEN, J. F. NIELSEN, S.B. NIELSEN, S. T. SALWIN, A.S. JENSEN, W. NOLDEN, K.H. COHNEN, A. MOHRS, S. SEIER
- 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. VENTURINI
- 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. SONESSON, 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*
C.D. PEIXOTO, E.K. FILHO, N.H.G.R. DE LOUREDO
- B1-111** *A novel method of restoring BCTC 525 kV submarine cable following a catastrophic breakage of a termination at a cable landing site*
T. KOJIMA, S. CHERUKUPALLI, C. MCWHIRTER
- 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*
T.H. LEE, S.I. SHIM, S.Y. KIM, J.B. PARK, H.D. PARK, C.S. GO, I.H. LEE, S.I. JEON
- 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. WANDA, R. GASPARI, 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

- B1-302** *A new concept for test equipment for testing large HV and UHV cables on-site*
P. MOHAUPT, A. BERGMAN
- B1-303** *Experience of withstand testing of cable systems in the USA*
R.N. HAMPTON, J. PERKEL, J.C. HERNANDEZ, M. BEGOVIC, J. HANS, R. RILEY, P. TYSCHENKO, F. DOHERTY, G. MURRAY, L. HONG, M.G. PEARMAN, C.L. FLETCHER, G.C. LINTE
- B1-304** *On-site commissioning test and diagnostics of 220 kV XLPE cable system*
M.M. AWAD, F. TAHOUN, A. EL FARASKOURY, O.E. GOUDA
- B1-305** *Use of on-line UWB PD techniques to evaluate a 161 kV underground cable after repetitive joint failures*
V.R. GARCIA-COLON
- B1-306** *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

PS1: Managing the environmental impact of new and existing overhead transmission lines

- B2-101** *Managing the environmental impact when upgrading an existing OHTL: sharing of a Belgian experience with the installation of ACCC*
J-F. GOFFINET, S. GERMAIN, J. HOEFFELMAN, B. PELSSERS, B. RISSE
- B2-102** *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
- B2-103** *Composite based overhead line systems - Reducing the visual impact of overhead lines*
T.K. SOERENSEN, J. HOLBOELL, G. KYED
- B2-104** *Conception of a 400 kV overhead line "sustainable development"*
F. SAUVEGRAIN
- B2-105** *Effective land use with special towers for increasing transmission capacity and raising the tower height*
K. SUZUKI, S. ROKUTANDA, S. ITODA
- B2-106** *400 kV compact lattice structure tower designed in DUBAI in the restricted corridors. Effects of electric and magnetic fields*
S. AL JALLAF, J. GEORGE, G. GHEORGHITA, E. DRAGAN, D. MARGINAN
- B2-107** *Overhead line in protected floodplain woodland „Extended Ecology“ as basis for OHL planning and maintenance*
A. HAGEN, F. LENGELACHNER, S. ABERLE, H. MINICHBERGER, H. LUGSCHITZ
- B2-108** *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
- B2-109** *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
- B2-110** *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. Ó LUAIN, K. COFFEY
- B2-111** *EMF mitigation characteristics of 154 kV compact transmission tower using insulation arms*
D.I. LEE, K.Y. SHIN, S.Y. LEE, W.K. LEE
- B2-112** *Development of a compact bipole 380 kV overhead line*
J.F. VAN WOLVEN, A.J.P. VAN DER WEKKEN, H.E. HOEKSTRA
- B2-113** *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

- B2-201** *Analysis of the possible conversion of overhead electrical lines from AC to DC*
L. COLLA, S. MALGAROTTI, M. REBOLINI, U. ZANETTA
- B2-202** *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
- B2-203** *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. MUGGIASCA, 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. MEKHANDOSHIN, 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. OSKOUUE, 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***
J. HAUDE, B. WÜHRMANN, U. SUNDERMANN, M. MAINKA, K. VIERECK, T. SYBEL, C. SCHOBERT, J. JÄGER, A. HENDORF, C. HOGA, , K-H. SCHWARZ, R. SIMON, F. STEINHAUSER, S. WEISS
- 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

SC B4 HVDC AND POWER ELECTRONICS

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***
M. PEREIRA, A. ZENKNER, M. CLAUS
- B4-105** ***Technical feasibility and research and development needs for ± 1000 kV and above HVDC system***
R.N. NAYAK, R.P. SASMAL, Y.K. SEHGAL, M. RASHWAN, G. FLISBERG
- B4-106** ***Viklandet and Tunnsjødal SVCs – Design, project execution and operating experience***
M. MEISINGSET, O. SKOGHEIM, B. EKEHOV, K. WIKSTRØM

- B4-107** ***The use of a static synchronous series compensator (SSSC) for power flow control in the 220 kV Spanish transmission network***
D. ALVIRA, M. TORRE, J. BOLA, U. BURDALO, M. MARQUEZ, M.A. RODRIGUEZ, J. CHIVITE, A. HERNÁNDEZ, S. ÁLVAREZ
- B4-108** ***Reliability study methodology for HVDC grids***
K. LINDÉN, B. JACOBSON, M.H.J. BOLLEN, J. LUNDQUIST
- B4-109** ***Continental overlay HVDC-grid***
G. ASPLUND, B. JACOBSON, B. BERGGREN, K. LINDÉN
- B4-110** ***VSC - HVDC transmission with cascaded two-level converters***
B. JACOBSON, P. KARLSSON, G. ASPLUND, L. HARNEFORS, T. JONSSON
- B4-111** ***A new hybrid voltage-sourced converter for HVDC power transmission***
C.C. DAVIDSON, D.R. TRAINER, C.D.M. OATES, R.W. CROOKES, N.M. MACLEOD, D.R. CRITCHLEY
PS2: HVDC and FACTS - Operating experience and new projects
- B4-201** ***Active and hybrid filters in medium voltage distribution power systems***
V.F. CORASANITI, M.B. BARBIERI, P.L. ARNERA, M.I. VALLA
- B4-202** ***Aysén-SIC HVDC transmission system: planning studies***
G. OLGUIN, J.C. ARANEDA, R. LA FUENTE
- B4-203** ***HVDC VSC (HVDC Light) transmission – operating experiences***
S. DODDS, B. RAILING, K. AKMAN, B. JACOBSON, T. WORZYK, B. NILSSON
- B4-204** ***The Rómulo project, Spanish peninsula – Mallorca (243 km, 250 kV, 2x200 MW): first Spanish HVDC link***
J. PRIETO, R. GRANADINO, E. BETTEN, G. CURTOTTI, H. WEINKAUF, C. VELÁZQUEZ, C. GAEBLER, S. ACHENBACH, A. GALARZA
- B4-205** ***FACTS for enabling wind power generation***
P. MUTTIK, R.W. BROWN, J. HADDOW, C. CHALMERS, G. GUM GEE, N. PAHALAWATHTHA
- B4-206** ***Static Var Compensator designed to enhance the operational reliability of Finnish transmission network***
M. LAHTINEN, T. RAUHALA, H. KUISTI, J. PELTOLA, P. HALONEN
- B4-207** ***450 MVA Statcom installation plan for stability improvement***
T. AKEDANI, J. HAYASHI, K. TEMMA, N. MORISHIMA
- B4-208** ***Design studies for the 3150 MW, ± 600 kV UHVDC Bipole 2 of the Rio Madeira long distance transmission project in Brazil***
N.M. MACLEOD, B.T. BARRETT, S. CHAKRAVORTY
- B4-209** ***A survey of the reliability of HVDC systems throughout the world during 2007 - 2008***
N.S. DHALIWAL, A. LEIRBUKT, M.G. BENNETT
PS3: HVDC and FACTS project development issues
- B4-301** ***New operation and control scheme of HVDC link under power market environment***
T. SAKAI, K. TAKAHASHI
- B4-302** ***Caprivi Link HVDC Interconnector: Site selection, geophysical investigations, interference impacts and design of the earth electrodes***
T.G. MAGG, H.D. MUTSCHLER, S. NYBERG, J. WASBORG, H. THUNEHED, B. SANDBERG
- B4-303** ***Power quality assessment when integrating an HVDC link into existing power grids***
X. YANG, Y. XIAO, S. NGUEFEU
- B4-304** ***HVDC-interaction-strength index for systems with multiple HVDC infeeds***
X.M. JIN, B.R. ZHOU, L. GUAN, X. CHENG, Y. ZHANG
- B4-305** ***Multi-terminal HVDC grid for network interconnection and renewable energy integration***
L. YAO, L. XU, M. BAZARGAN, R. CRITCHLEY
- B4-306** ***HVDC Madeira transmission system - planning development and final design***
P.C.V. ESMERALDO, E.M.A. ARAUJO, D.S. CARVALHO JR.

SC B5 PROTECTION AND AUTOMATION

PS1: Protection, control and monitoring for the next decade

- B5-101** ***System for integration of protection and control devices***
G.A. ARRUDA, J.F. MESQUITA, I.P. SIQUEIRA, J.C. LIMA, S.G. CAUPONI
- B5-102** ***New solutions for substation automation, protection and control based on IEC 61850 in cogeneration plants with integration to process automation***
L.F. SANTOS, K.P. BRAND, P. REINHARDT

- B5-103** *Study on data transmission standard for RTDMS for power systems*
Y. WANG, D. ZHANG, Y. YU, X. XIE
- B5-104** *Scenarios for future substation automation systems*
L. HOSSENLOPP
- B5-105** *Future developments in protection, control and monitoring from a manufacturer perspective*
N. SCHUSTER, H-J. HERRMANN, T. JACHMANN
- B5-106** *Current differential protection over ethernet*
G. BABER, P. BEAUMONT, F. KAWANO
- B5-107** *Intelligent voltage difference control - maintaining the voltage stability limit*
A. WISZNIEWSKI, W. REBIZANT, A. KLIMEK
- B5-108** *Lifetime management of relay settings*
P. CROSSLEY, R. LOKEN, J. FITCH, B. GWYN, C. MEMPEL, D. NOVOSEL, N. CASTRO MARTINS, J. CARDENAS, J. LIMA
- B5-109** *Modern OHL thermal overload protection system based on an ampacity system and automatic actions in generation and load*
F. GONZALEZ, J. NIZOVOY
- B5-110** *Substation automation in the next decade: predictable steps and sound visions*
J.M. ORDACGI FILHO, R.B. SOLLERO, W. BAASS, K.P. BRAND, I. DE MESMAEKER, T. WERNER
- B5-111** *Protection of compensated transmission lines with STATCOM using ANN*
A.N. ABDEL-LATIEF, A.F. ABDEL-GAWAD, M.E. MANDOUR
- B5-112** *Disturbance recording systems within the environment of IEC 61850: built-in or stand alone?*
M.A. EL-HADIDY, D.H. HELMI, M.S. ABDELHADY
- B5-113** *New requirements for substation automation systems*
M. PETRINI, C. SABELLI, E. CASALE
- B5-114** *From the wide area monitoring to the wide area protection in the Romanian power grid*
I. NEDELICU, I.P. VIZITEU, F. BALASIU, A. MIRON
- B5-115** *Intelligent relay protection development concept*
A.F. DYAKOV, Y.Y. LIAMETS, G.S. NUDELMAN, A.N. PODSHIVALIN, J. ZAKONJSEK, A.V. ZHUKOV
- B5-116** *IEC 61850 9-2 Process Bus: Application in a real multivendor substation*
J. CASTELLANOS, I. OJANGUREN, I. GARCES, R. HUNT, J. CARDENAS, J. CARDENAS, M. ZAMALLOA, J. GARCIA, A. GALLASTEGUI, M. YUBERO, E. OTAOLA
- B5-117** *Converting field recorded data to information: new requirements and concepts for the 21st century automated monitoring solutions*
P.T. MYRDA, M. KEZUNOVIC, S. STERNFELD, D.R. SEVCIK, T. POPOVIC
- PS2: Impact of renewable generation and cogeneration on substation automation and protection**
- B5-201** *Experience with protection systems for distributed generators and the grid-interconnection code in Japan*
T. MAEDA, W. TAKI, M. USUI, K. SEKIGUCHI, C. KOMATSU, H. ITO
- B5-202** *Hydrogenerator as a black-starter for a power plant. Protection requirements*
S. WROBLEWSKA, H. DYTRY, W. SZWEICER, M. NIEDZWIEDZIK, Z. LUBOSNY
- B5-203** *Essential on cogeneration units protection*
F. BALASIU, GH. MORARU
- B5-204** *Impact on the power system protection of high penetration of wind farms technology*
I. DE LA FUENTE DEL CASTILLO, M.A. ORDUÑEZ DEL PINO, G. MOLINA ZUBIRI, S. LOPEZ BARBA
- B5-205** *Protection security assessment – going along with the development of today’s networks to smart grids*
J. JÄGER, R. KREBS, F. BALASIU, F. LAZAR, P. LUND
- B5-206** *The impact of renewable energy sources and distributed generation on substation protection and automation*
J.A. GONZÁLEZ, A. DYŚKO, G. LLOYD
- B5-207** *Optimal control of microgrid resources*
M. KROK, A. PALIZBAN, S. ALLAN, D. FINNEY, M. ADAMIAK
- B5-208** *Impact of renewable generation on protection and disconnecting solutions – German practice and experiences*
H-J. HERRMANN, H. KÜHN, H. FÖHRING, A. LUDWIG, F. OECHSLE, P. SCHEGNER
- B5-209** *Islanding detection using an accumulated phase angle drift measurement*
R.M. TUMILTY, H.T. YIP, A. DYSKO, G.M. BURT, G. LLOYD

SC C1 SYSTEM DEVELOPMENT AND ECONOMICS

PS1: Solutions for planning power systems for a low carbon energy future

- C1-101** *Interactive electric energy control - A new concept of the grid for low carbon energy future*
T. NITTA, Y. SATOH, Y. MITANI, H. SAITOH, N. HIGUCHI, H. OHASHI
- C1-102** *First transmission grid plan with strategic environmental assessment in Portugal: added value to the electric system*
M. PARTIDÁRIO, J. RICARDO, J. PERALTA, M. PINTO, B. AUGUSTO
- C1-103** *Grid integration of offshore windfarm Côte d'Albatre to the French transmission grid*
D. MUSHAMALIRWA, M. DESCHATRES, T. WEBER, C. HILBERG, P. MAIBACH, W. JANSSEN, T. LESKE, S. KEHRER, D. SAINT-ANDRE
- C1-104** *European wind integration study EWIS – towards a successful integration of wind power into European electricity grids*
L. DALE, L. FISCHER, D. KLAAR, J-M. RODRIGUEZ, H. VANDERBROUCKE, W. WINTER
- C1-105** *Prospects for the transmission planning in Europe towards a sustainable energy future: the REALISEGRID project*
G. MIGLIAVACCA, A. L'ABBATE, I. LOSA, S. GALANT, A. VAFÉAS, T. PAGANO, G. FULLI, H. AUER, M. GIBESCU, A. CIUPULIGA, K. JANSEN, K. REICH, O. WADOSCH, E.M. CARLINI, P. ANTONELLI, C. VERGINE, P. ADAM, X. GALLET
- C1-106** *Multi-energy transmission – an option for system development ?*
P. FAVRE-PERROD, T. KRAUSE
- C1-107** *The Brazilian market-based expansion and low carbon energy future - issues and solutions*
J.C. MELLO, M.R. SOUZA, F.V. MOREIRA, T.M. PRANDINI, S. ARECO
- C1-108** *Reliability assessment and planning of power generation systems for low emission energy performance*
E.N. DIALYNAS, L.G. DAOUTIS, J. KABOURIS
- C1-109** *An innovative methodology of network planning on the GB transmission system*
B. TAN, L. FU
- C1-110** *A comprehensive approach for studying the economic and reliability impacts of greenhouse gas policies*
S. VENKATARAMAN, H. ELAHI, A. CHAHAL, J. LOVE

PS2: New business processes to support / facilitate power system design for a low carbon energy future

- C1-201** *Research on large-scale wind power exploitation and long distance transmission planning method*
D.X. JIA, J.H. BAI, S.X. XIN
- C1-202** *A novel transmission system planning method combining market simulations and load flow calculations for identifying bottlenecks in systems with large RES penetration*
P.G.H. JACOBS, A. MAHES, A.R. CIUPULIGA, R.A. VAN OFFEREN, E. PELGRUM, C.P.J. JANSEN, M. GIBESCU
- C1-203** *Spatio-temporal correlations of available wind power and impact on transmission power flows*
K.R.W. BELL, D.C. HILL, D. MCMILLAN, F. LI, R.W. DUNN, G.W. AULT, D.G. INFELD
- C1-204** *Feasibility aspects of a synchronous coupling of the IPS/UPS with the UCTE*
M. LUTHER, I. BIERNACKA, A. MENZE, J.M. RODRIGUEZ-GARCIA, D. PREOTESCU
- C1-205** *Grid Asset Management Suite (GAMS) for improved control of network cost and quality of supply*
M. SCHWAN, T. GLÜCKSELIG, C. HEUER, S. MAUSER, B. BECKETT
- C1-206** *A mathematical structure for the assessment of transmission system augmentation in the Australian national electricity market*
N. HOSSEINZADEH, M.R. HESAMZADEH, D.R. BIGGAR
- C1-207** *Assessing the market benefits of network augmentations in the presence of wind farms*
D. BONES, L. STEEN
- C1-208** *Wind farms as a source of uncertainty in the process of power system development planning – causes and effects*
K. LIPKO, W. LUBICKI, M. PRZYGRDZKI
- C1-209** *Optimal storage location and layout in power supply systems*
F.J. ADAMEK

PS3: Asset management challenges/strategies (replacement, refurbishment and maintenance) for a low carbon energy future

- C1-301** *On uncertainties of reliability indices*
F. CAMARA NETO, M.TH. SCHILLING, A.M. LEITE DA SILVA, M.A.N. SILVEIRA, A.M. REI
- C1-302** *Large scale integration of renewable sources in the Brazilian bulk power system*
I. GARDOS, R.D. FURST, P. GOMES, A. BIANCO

- C1-303** *Long-term grid planning in the Netherlands*
P.G.H. JACOBS, M.A.M.M. VAN DER MEUDEN, F.J.C.M. SPAAN, I. J. TIGSCHELAAR
- C1-304** *The connection procedures for renewable generation within the transmission grid planning process. Situation and prospects in the Iberian power systems*
J. F. ALONSO LLORENTE, A. REIS RODRIGUES
- C1-305** *Analysis on integrating large scale wind power into power grid*
J. ZHAO, R. LI, Y. SHEN, H. SUN, J. DING
- C1-306** *The challenge of reducing energy losses in transmission system – RTE’s approach and objectives*
E. JAUSSAUD, F. CLERC, D. COISNARD
- C1-307** *Increasing the efficiency of electrical networks in regulated markets considering uncertainties*
K. MEISA, T. PAULUN, H-J. HAUBRICH, F. BERGER

SC C2 SYSTEM OPERATION AND CONTROL

PS1: Enhancement of operational reliability

- C2-101** *Using heuristic search procedures to determine fluent restoration paths for the Brazilian interconnected power system*
F.R.M. ALVES, R.M. HENRIQUES, J.A. PASSOS FILHO, A.P. GUARINI, D.M. FALCÃO
- C2-102** *Wide-area coordinated and adaptive damping control of multiple HVDC links in China southern power grid*
C. LU, Y.D. HAN, J.B. HE, X.C. WU, P. LI, L.C. LI, J.T. WU, J.H. SHI, J. HU
- C2-103** *Performance evaluation for K-WAMS (Korean wide area monitoring system) under field operating condition of Korea power grid*
S.T. KIM, J.Y. KIM, S.H. JANG, S.W. HAN, B. LEE, Y.H. MOON, T.H. KIM
- C2-104** *Enhancing operational reliability of the UPS of Russia using automatic emergency control*
N.G. SHULGINOV, A.V. ZHUKOV, A.T. DEMCHUK, L.A. KOSHCHEYEV, P.Y. KATS, M.A. EDLIN
- C2-105** *Low frequency oscillations in the Colombian power system - identification and remedial actions*
O.J. ARANGO, H.M. SÁNCHEZ, D.H. WILSON
- C2-106** *Experiences of the Belgian and French TSOs using the "Ampacimon" real-time dynamic rating system*
E. CLOET, J-L LILIEN, P. FERRIÈRES
- C2-107** *Design and implementation of a tool for assessment of secure level of wind on the Irish power system*
R. AHERNE, J. CONROY, D. CONNOLLY, R. DOYLE, I. DUDURYCH, H. JONES, A. ROGERS
- C2-108** *On-line analysis of the electrical system security: an extensive simulation approach in a Dynamic Security Assessment (DSA) environment*
G. GIANNUZZI, C. SABELLI, R. SALVATI, R. ZAOTTINI, C. CANDIA, M. CIGNATTA, A. DANELLI, M. POZZI, M. STORI
- C2-109** *Real time dynamic security assessment and control by combining FACTS and SPS*
K. SUZUKI, N. SAITO, H. NISHIIRI, T. KAWAHARA, T. MAEDA
- C2-110** *International power grid interconnections in Mexico*
M.A. AVILA, H.G. SARMIENTO, D. LEON
- C2-111** *Digital model power systems of real time for information support of dispatcher power systems*
M.A. RABINOVICH, JU.I. MORJN, S.P. POTAPENKO
- C2-112** *The application of wide area monitoring to the GB transmission system to facilitate large-scale integration of renewable generation*
A.M. CARTER, M. PERRY, C.H. BAYFIELD, T. CUMMING, R. FOLKES, D.H. WILSON
- C2-113** *Real-time, wide-area measurements for improved operator response*
R. MOXLEY, G. ZWEIGLE
- C2-114** *Development of standards for the secure and reliable operation of electric power systems*
O.P. VELOZA SALCEDO, R.H. CÉSPEDES GANDARILLAS

PS2: Consistency and coordination of system control and operation

- C2-201** *Brazilian power system: criteria, operating standard metrics and performance indicators*
SAULO J.N. CISNEIROS, P. GOMES, DALTON O.C. BRASIL, SILVIA S.C. BRASIL
- C2-202** *Powergrid’s experience in evolving architecture needs in system control and operation; present and future prospects*
N.S. SODHA, A.S. KUSHWAHA, A.K. MISHRA, S. CHOHAN
- C2-203** *Lessons learnt after one year of running a technical coordination service centre in the Central Western Europe*
F. BOULET, O. ARRIVE, P. DE LEENER, M. BRADLEY

- C2-204** *Special protection system in the interface between the Turkish and ENTSO-E power systems to counteract propagation of major disturbances*
F. ILICETO, A. GUBERNALI, K. YILDIR, Y. DURUKAN
- C2-205** *New TSO coordination initiative in Europe*
K. ALMASI, A. DETKIEWICZ, W. DREINDL, R. KLEIN, G. MIKA, O. OBERT, R. PIRCHER, M. ROGGE, M. SCHMID, M. STROUHAL, A. TISCHNER, K-W. TAPP, T. TÜRKUCAR, D. KLAAR
- C2-206** *NOIS (Nordic Operational Information System) - A successful joint Nordic project in close co-operation*
C. NORLANDER, D. AUGUY, F. NILSSON, A-K. NYSTAD, J. SILTALA, S-R. HANSEN
- C2-207** *Grid implementation and operational use of large phase shifting transformers in the Belgian HV grid to cope with international network challenges*
J. WARICHET, O. BROCKART, J. VAN HECKE, J.L. LEONARD, J. RIMEZ
- C2-208** *Issues related to shared responsibilities between traditional transmission utilities and new agents – the Brazilian case*
A.C. BARBOSA MARTINS, P. GOMES, C. RIBEIRO ZANI, A.M.S. OLIVEIRA, S.L.A. SARDINHA, A. P. GUARINI, C. RIBEIRO, N. MARTINS
- C2-209** *Development of a Chinese standard on WAMS main station for further enhancement of real-time dynamics monitoring capability*
Y.J. FANG, D.N. ZHANG, D. YANG, Y. XU, T.S. XU
- C2-210** *Increased cooperation between TSO as a precondition for coping with new challenges in system operation*
M. KRANHOLD, C. BÄCK, F. NORLUND, P.B. ERIKSEN, M. MÜLLER-MIENACK, O. ZIEMANN, R. PAPROCKI, Z. STYCZYNSKI
- C2-211** *Voltage management system using hybrid voltage control to enhance voltage stability in Jeju power system*
T.K. KIM, J.H. SHIN, N.H. KWAK, J.M. CHO, J.C. BAE, S. SEO, Y.H. CHOI, B. LEE
- C2-212** *Risk assessment methodology for operations applied to the Portuguese transmission system - the probabilistic model*
S.A.B. DE ALMEIDA, R. PESTANA, F.P. MACIEL BARBOSA

SC C3 SYSTEM ENVIRONMENTAL PERFORMANCE

PS1: Innovative environmental studies for power transmission corridors

- C3-101** *Biosecurity strategies – an Australian context*
S. MARTIN, B. YEP, M. ABEL
- C3-102** *Environmental studies for power transmission corridors selection: how AHP (analytical hierarchical process) can help*
P.C.P. MENEZES, D.F. MATOS, J.M. DAMAZIO, C.B. CRUZ, S.H.M. PIRES, K.C. GARCIA, A.M. MEDEIROS, L.R.L. PAZ
- C3-103** *Evolution of environmental management of transmission lines in Brazil - improvements, challenges and prospects*
K.G. MATOSINHO, R.C. FURTADO, H.M. VIEIRA, F.P. SERRAN, L.A. SILVA
- C3-104** *RTE's actions and agreements with stakeholders aiming at promoting biodiversity in forest channels*
E. JAUSSAUD, B. BOURGUIGNON
- C3-105** *Solutions to meet power demand in metropolitan region*
S.V. DESHMUKH, D. RAINA, P. MURUGAN, S.S. PATHAK, A.F. JACHIM, H.E. DEVE
- C3-106** *Adaptive management-based process for forest restoration by natural regeneration*
S. ABE, M. NASHIMOTO
- C3-107** *How can specific information needs of stakeholders regarding potential health risks from chemicals be identified ?*
H. KUBOTA, M. KOSUGI, T. TSUCHIYA
- C3-108** *Camouflage of power lines to reduce visual impacts and enhance public acceptance*
N.H. JOHNSON
- C3-109** *The management of safety corridor for Transelectrica 220 – 400 kV OHL transmission lines*
I. MERFU, P.C. STROICA, M. MERFU
- C3-110** *Reduction of the electrical potential of interfered pipelines due to currents of high voltage power lines and electric railways*
L. FICKERT, E. SCHMAUTZER, M. LINDINGER, R. BRAUNSTEIN
- C3-111** *Contribution of hydro-generation to the Egyptian energy need and environment*
R.M. RADWAN, M.M. AWAD, M.M. FARAG ALLAH

- C3-112** *Regularly cleared right-of-way; an important habitat for grassland and mire butterflies and vegetation*
A. LEVULA, T. SKUITUNEN, T. LENSU
- C3-113** *Innovative approach of the potential impact of HV lines on their environment: the experimental farm*
F. DESCHAMPS, L. DEVEAUX, K. RIGALMA, C. DUVEAUX-PONTER, S. ROUSSEL
- C3-114** *Lineal infrastructures mixed corridors*
R. SAN MILLÁN, A. SALINAS, M. VAZQUEZ

PS2: External costs accounting of environmental and social impacts of power generation and transmission

- C3-201** *Socio environmental transmission costs in Brazil*
E. MESQUITA
- C3-202** *Analysis of socio-environmental costs in the operational phase of hydropower projects in Brazil*
A.L. MUSTAFÁ, M.R. NUTI
- C3-203** *Procedures to evaluate socio-environmental costs during the planning phase of transmission systems*
F.P. SERRAN, H.M. VIEIRA, K. MATOSINHO, R.C. FURTADO
- C3-204** *External costs in the environmental risk assessment of hydropower project investment analysis*
S.H.M. PIRES, D.F. MATOS, J.M. DAMAZIO, P.C.P. MENEZES, K.C. GARCIA, A.M. MEDEIROS, L.R.L. PAZ
- C3-205** *External costs of transmission: State of RTE's knowledge and practical experience*
E. SERRES, G. DE SAINT MARTIN, J. ISOARD
- C3-206** *The external costs evaluation for power transmission lines: focus on overhead lines*
P. GIRARDI, S. MARAN, C. BRAMBILLA
- C3-207** *Environmental and social cost experiences on large transmission line projects in California*
D.O. PROCTOR

SC C4 SYSTEM TECHNICAL PERFORMANCE

PS1: EMC/EMF and PQ for future networks - compatibility requirements, assessment techniques/tools, and technical performance improvement programmes

- C4-101** *Harmonics measurement campaign results to identify causes of component overloads on 3rd and 5th harmonic filters in the Ibiuna substation*
J.R. MEDEIROS, D.O.C. BRASIL, S.X. DUARTE, T.P. SOUZA, N. KAGAN
- C4-102** *Cancelled - Considerations about the energy absorbed by non gapped line arresters applied on 230 kV overhead transmission lines*
- C4-103** *3D numerical computation of the induced potential distribution on buried pipelines by neighbour HV lines working on normal and fault conditions*
C. MUNTEANU, V. TOPA, L. GRINDEI, I.T. POP, GH. VISAN, C. DIACONU, J. DECONINCK, V. CHATZIATHANASIOU, L. BORTELS
- C4-104** *Harmonic spectrum assessment for low voltage customers in IDECO with a focus on variable filter design*
M.H. ABDERRAZZAQ, M.M. KASSAWNH, A.R. ALWEDIAN
- C4-105** *Novel multi-port equivalent including several detailed subsystems for EMTP/TSP-simulation*
G. BYEON, C. SONG, G. JANG
- C4-106** *Allocation of emission limits for individual emitters at different voltage levels: flicker and harmonics*
M. BOLLEN, M. HÄGER, M. OLOFSSON
- C4-107** *CIGRE/CIREU/UIE joint working group C4.110, voltage DIP immunity of equipment in installations – main contributions*
M. BOLLEN ON BEHALF OF JWG C4.110
- C4-108** *Fault location in active distribution networks by means of the continuous-wavelet analysis of fault-originated high frequency transients*
A. BORGHETTI, M. BOSETTI, C.A. NUCCI, M. PAOLONE, A. ABUR
- C4-109** *Steady-state and transient EHV AC cable shunt reactive compensation assessment*
R. BENATO, S. LAURIA, F.M. GATTA, L. COLLA, M. REBOLINI, F. RENAUD
- C4-110** *Power quality monitoring in the Romanian power grid*
C. STANESCU, S. GAL, S. PISPIRIS, P. POSTOLACHE, J. WIDMER
- C4-111** *Harmonic analysis using wavelet technique in a large scale power quality monitoring system*
M.A. EL-HADIDY, D.H. HELMI, A.A. ALOKABI
- C4-112** *Power quality management in New Zealand*
N.R. WATSON, S. HARDIE, J. LAWRENCE, W. HEFFERNAN, T. SCOTT, S. HIRSCH, W. WILSON

C4-113 *Innovative substation solutions in new electrical environment*

Y.M. SHLEMENZON, K.J. ILIEV

PS2: Advances in insulation coordination and lightning knowledge for improved performance of electric power systems

C4-201 *Lightning shielding failure analysis of 1000 kV ultra-high voltage AC transmission line*

J.L. HE, R. ZENG

C4-202 *Research on the wave-front correction coefficient used in the flashover experiment of switching impulse in 1000 kV and 750 kV transmission line*

Y.C. YUAN, J.Y. GUO, L. LIU, C. DENG

C4-203 *Modelling of overhead power line insulation using modern numerical tools - advantages and limitations in practical application*

P.H. PRETORIUS, R.G. STEPHEN, D. MUFTIC, S. SADOVIC, K. SOKOLIJA

C4-204 *Large-scale experimental field tests of practical earthing systems under transient conditions*

H. GRIFFITHS, N. HARID, D. GUO, D. LATHI, A. HADDAD, A. AINSLEY

C4-205 *Lightning current measurement on an overhead line equipped with line arresters*

A. XEMARD, S. SADOVIC, T. SADOVIC, M. MESIC, M. PUHARIC, A. GUERRIER

C4-206 *An investigation into lightning exposure of massive structures*

F.A.M. RIZK

C4-207 *Observation results of lightning shielding and improvement in the prediction method for the lightning failure rate with large-sized transmission lines*

S. OKABE, S. TANIGUCHI, T. TSUBOI, H. OHTA, E. ZAIMA

PS3: Techniques and tools for power balancing assessments and risk-based security assessment

C4-301 *Cancelled - Using adaptive control techniques for the secondary frequency controller design*

C4-302 *Risk evaluation in power system contingency analyses*

E. CIAPESSONI, D. CIRIO, E. GAGLIOTI, S. MASSUCCO, A. PITTO, F. SILVESTRO

C4-303 *Reliability assessment of active distribution networks*

G. CELLI, E. GHIANI, S. MOCCI, F. PILO, G. PISANO, G.G. SOMA

C4-304 *Development of load frequency control simulation tool*

T. INOUE, H. AMANO, K. HANAMOTO, W. WAYAMA, Y. ICHIKAWA

C4-305 *IEA ENARD: international collaboration on developments in transmission systems R&D*

K. UHLEN, D. CIRIO, L. HAARLA, D. BEKAERT, K.B. JENSEN, C. DUTHALER, L.K. VORMEDAL, S. LARSSON, L.A. FODSTAD

C4-306 *Application of wind generation capacity credits in the Great Britain and Ireland systems*

C.J. DENT, B. HASCHE, A. KEANE, J.W. BIALEK

C4-307 *Methods and software tools for evaluation, forecasting and analysis of electric power and energy balances in electric power companies of Russia*

P.S. ABAKHSHIN, V.E. VOROTNITSKI, M.V. EGOROV, M.A. KALINKINA, B.I. MAKOKLYUEV, A.S. POLIZHAROV, T.N. PROTOPOPOVA, O.V. TURKINA

SC C5 ELECTRICITY MARKETS AND REGULATION

PS1: Challenges of national or state regulations of transmission and system operators in regional markets

C5-101 *Experience of India's first power exchange and challenges ahead*

RAVINDER, A. AWASTHY

C5-102 *Harmonization of cross border transmission capacity allocation within the Central West Europe region*

S. BOURDON, S. CHOUTEAU, C. PFLANZ, E. SPIRE, S. BRUJNS, J. VANZETTA, R. NEUMAIER, C. BARTOCCI

C5-103 *Interregional market coupling - a challenge for the NorNed cable*

R. BEUNE, J. VAN PUTTEN, K. A. BARMSNES, O. GJERDE

C5-104 *Harmonization and integration of national balancing markets in Europe – regulatory challenges*

R.A.C. VAN DER VEEN, G.L. DOORMAN, O.S. GRANDE, A. ABBASY, R.A. HAKVOORT, F.A. NOBEL, D.A.M. KLAAR,

C5-105 *Experiences and challenges of the Brazilian transmission system in search of efficiency*

S.J.N. CISNEIROS, F. M.C. FERREIRA

C5-106 *Czech and Slovak spot electricity market coupling on the basis of implicit capacity allocation*

P. ŠOLC, B. NĚMEČEK

C5-107 *Multiple power exchanges in India – a case study*

S.K. SOONEE, S.S. BARPANDA, M.K. AGRAWAL, S.C. SAXENA

- C5-108** *Approaches and accomplishments to enhance multi-regional market taking into account reliability in Japan*
H. OKAMOTO, J. NAITO, A. YOKOYAMA
- C5-201** *Role of storage systems and market based ancillary services in active distribution networks management*
F. BIGNUCOLO, R. CALDON, L. CARRADORE, A. SACCO, R. TURRI
- C5-202** *Experience of reliability-based demand response implementation in Korea*
J.K. PARK, Y.T. YOON, C.H. LEE, Y.S. YOO, H.C. LEE, T.H. YOO, J.W. NOH
- C5-203** *User acceptance of ancillary service markets*
W.L. KLING, J. FRUNT
- C5-204** *A commercial architecture for the aggregation and trade of active demand services*
R. BELHOMME, F. BOUFFARD, A. DIOP, M. SEBASTIAN, C. YUEN, R. CERERO, G. VALTORTA
- C5-205** *Impact of a high concentration of wind generation in the Australian electricity market – experience to date and expected future performance*
D. SWIFT, D. BOWKER
- C5-206** *Market designs for a better integration of intermittent generation: European experience and future trends*
M. DUPUY, B. PEYRON, E. COLOMBO
- C5-207** *Impact of wind generation on the voltage control ancillary service and the development of the Italian transmission system*
E.M. CARLINI, P.P. PERICOLO, P. MARANNINO, I. SIVIERO, R. VAILATI
- C5-208** *Customer involvement in load control via capacity market mechanisms*
F.Y. OPADCHIY, A.M. KATAYEV
- C5-209** *Impact of high levels of wind and other variable renewable generation on the grid operation: summary of major US studies*
K. CLARK, L.A. FREEMAN, G.A. JORDAN, N.W. MILLER, R.J. PIWKO, R.A. WALLING, D. LEW
- C5-210** *Integration of advanced storage technologies in the New York wholesale electricity market*
R. MUKERJI, R. PIKE, J. HICKEY

PS3: Interactions of environmental incentives and markets (e.g. carbon) with electricity markets

- C5-301** *Key issues on the design of China's SO2 emission trading scheme of power sector*
Y. ZHUANG, L.P. JIANG, L. MA, R. FU, B. PANG
- C5-302** *Impact of CO2 reduction targets on transmission capacity expansion dictated by the power market clearing: application to the Italian and French systems*
E.M. CARLINI, P.P. PERICOLO, F. VEDOVELLI, B. COVA, A. VENTURINI, S. LEPY, E. MOMOT
- C5-303** *Potential impact of expanded renewable target and emission trading scheme on Australian electricity market*
T. BAKER, M. YORK
- C5-304** *Market issues for generation expansion accounting for energy security and environmental aspects*
X. VIEIRA, J.L. ALQUERES, M. VEIGA, P. BORN

SC C6 DISTRIBUTION SYSTEMS AND DISPERSED GENERATION

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

- 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. STYCZYNSKI, M. GURBIEL, H. RIIS, ZITA A. VALE, A.M. GELFAND, V.V. KOSTENKO, 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. ØSTERGAARD, 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. KOSHIO, 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*
E. GARCÍA SÁNCHEZ, A. RODRÍGUEZ APARICIO, M. GARCÍA CASADO, P. MARTÍN MUÑOZ, R. MORA, J. DIAZ GARCIA, S. FRESNILLO VELASCO, A. VALERA VÁZQUEZ, A. LÓPEZ, D. ROMÁN, M. GARCÍA, R. SANZ
- 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. BOUIA, V. MURIN, D. OSSO, 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.J. KIM, 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. TSIROULIS, P. MOUTIS, S. CHADJIVASSILIADIS, E. KARFOPOULOS, T. TOMTSI, S. TSELEPIS, 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. NEGM, N. HEGGY, A.S. IBRAHIM, I. AHMED, S. TAWFIK

D1-102 **Comparison between mineral and ester oils**
C. PERRIER, M. RYADI, 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**
A. KÜCHLER, M. LIEBSCHNER, A. REUMANN, C. KRAUSE, U. PIOVAN, B. HEINRICH, R. FRITSCH, J. HOPPE, A. LANGENS, J. TITZE

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**
J.H. LEE, M.H. SONG, J.K. LEE, S.H. KANG, D.K. KIM, J.S. IM

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**
E. GULSKI, P. CICHECKI, J.J. SMIT, F. DE VRIES, J. PELLIS, D. VAN HOUWELINGEN, F. WESTER, R. BODEGA, T.J.W.H. HERMANS

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

D1-207 **Combination of different techniques for improved interpretation of PD measurements**
S. TENBOHLEN, A. PFEFFER, 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 COTTHEM, 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. DUBOSCQ, P. PRIEUR

D1-213 **Diagnostic markers for oxidation condition of mineral oil and ester insulating fluids**
I. ATANASOVA-HOEHLIN, 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. NAVA, O. ESCORSA
- D1-216** *Interpretation of dielectric spectroscopy results in time and frequency domains for power cables*
S. BHUMIWAT
- 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. ŠTURLIĆ
- 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. CHENINE, L. NORDSTRÖM
- D2/B5-105** *Communication between substation with 61850 technology and control centre*
C. BRUNER, W. BRODT, H. ENGLERT, K. RIAN, A. WEST, P. LHUILLIER
- 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. DUFOUR, P. D'AMORE, I. STEINBRECHER, F. FERNANDEZ, E. SCHIAVINO
- 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 MOTTA

- 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 Espana**
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