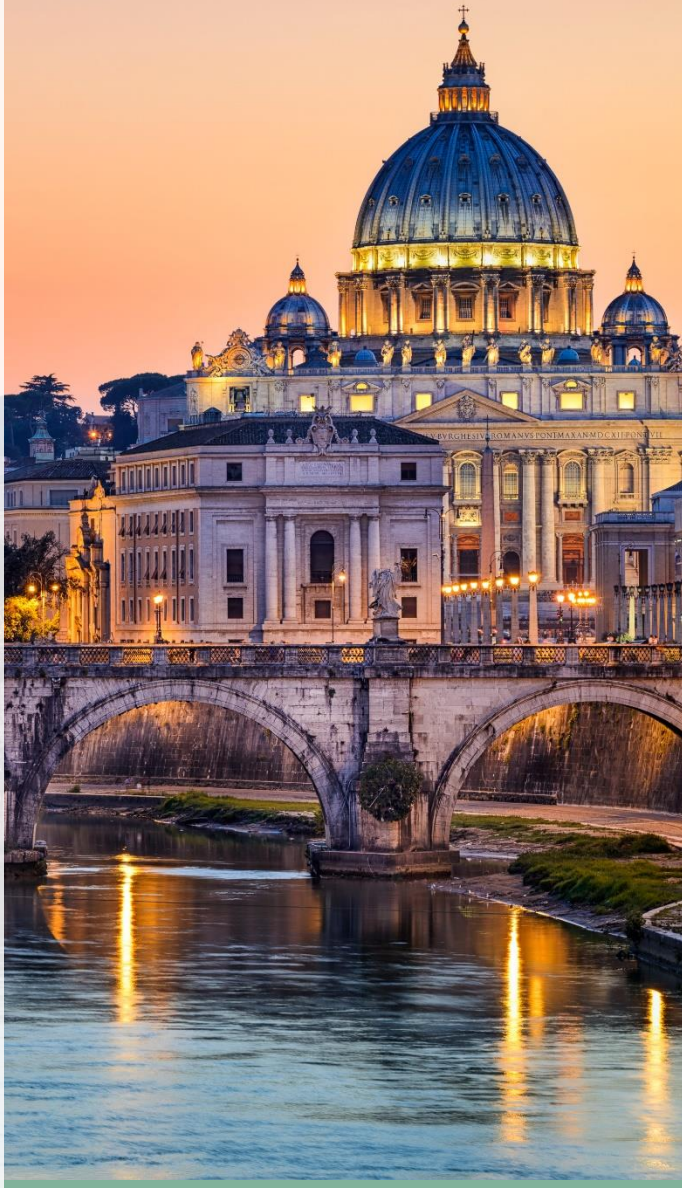
List of selected full papers



22 MAY 2023

CIRED

ROME, ITALY

12-15 JUNE 2023

Session 1 : Network Components

10114 *Statistically Validated Lifetime Assessment and Health Index Using Survival Analysis Stratifications*
Mischa Vermeer, Gerard Cliteur, Bernd van Maanen
DNV, The Netherlands

10120 *Failure Prediction for Circuit Breakers: Vibration and Trip Coil Current Feature Extraction for Machine Learning Applications*
Jan Henning Jürgensen, Henrik Bohm, Camilla Hansson, Mikael Sollén, Anders Norström
Vattenfall Eldistribution AB, Sweden

10133 *Real And Virtual Testing Of The Future Electrical Power Systems*
Iñaki Orue, Leire Redondo, Nabil Akroud, Ian Paul Gilbert
Ormazabal, Spain

10173 *Influence of Circuit Breaker Mounting on its Lifetime*
Ondrej Frantisek, Carlos Crespo Hornillos, Alessandro Bonfanti, Alessandro Stucchi, Claudio Cenci, Corrado Rizzi, Dukkaiappan Subbiah Thevar
1: ABB AG Research Center, Germany; 2: ABB SpA, Italy; 3: ABB AG, Germany

10186 *System Issues & Mitigations - Reclosers Installations Experience From Developing Countries*
Vijay Shah, V Ramesh, Gary Foubert
1: ABB India Ltd, India; 2: ABB SpA Dalmine, Italy

10206 *FORM: A Novel Principle for DLR*
David Skrovanek, Christian Grosser, Georg Letsch, Uwe Ziebold
1: University of Wisconsin-Madison, USA; 2: PI-COM Ingenieurbüro e.K., Germany; 3: 50Hertz Transmission GmbH, Germany

10211 *Assessment of Breakdown Voltage for Low Density Polyethylene Cables Using Nano Aluminium Dioxide Filler*
Eman El_Sherkawy, Loai S. Nasrat, Mahmoud Rihan
1: The High Institute of Engineering and Technology, Egypt; 2: Faculty of Engineering Aswan University, Egypt; 3: Faculty of Engineering South Valley University, Egypt

10212 *Pro-Active Approach To Mitigating Bird Mortalities On Distribution Networks*
Andreas Beutel, Rudi Kruger, Bruce McLaren, Denise Hewitt, Nishanth Parus, Chandima Gomes
1: Eskom Holdings SOC Ltd, South Africa; 2: University of the Witwatersrand

10225 *Enel's Circular by Design Approach for Grid Components*
Massimo Bartolucci, Giuseppe Di Tommaso, Fabrizio Gasbarri, Lourdes Garcia, William Di Tullio, Luca Di Rocco, Samuele Giovannetti, Maria Cristina Papetti, Marina Lombardi
1: Enel, Italy; 2: Enel, Spain

10231 *IoT Sensors To Increase Resilience Against Critical Weather Events*
Andrea Cielo, Giorgio Ghillardi, Valerio Vallocchia
1: Gridspertise; 2: Enel S.p.A.; 3: Enel Grids

10235 *Concept Of A Partial Discharge Analysis By Applying Specific Digital Twins*
Erhard Aumann, Franck Voufo, Thomas Hammer, Svetlana Gossmann, Dirk Westermann
1: Siemens AG, Germany; 2: Technische Universität Ilmenau; 3: Robert Bosch GmbH, Germany

10237 *Profitability Of Condition Monitoring In The Electric Distribution Grid*
Hugo Vincenti, Sylvie Koziel, Patrik Hilber
KTH (Royal Institute of Technology), Sweden

10242 *C4F7N and C5F10O Gases Used as Substitution of SF6 Have Neurotoxic, Mutagenic and Teratogenic Effects on Rats/Mice*
Weihao Liu, Shuangshuang Tian, Zian Yuan, Xiaoxing Zhang, Fanchao Ye, Yi Li
1: Hubei Engineering Research Center for Safety Monitoring of New Energy and Power Grid Equipment, Hubei University of Technology, Wuhan 430068, China; 2: School of Electrical Engineering and Automation, Wuhan University, Wuhan, China

10250 *Symmetry Breaking Due to Capacitive Ground Coupling in a Vacuum Interrupter*
Gabriel Lantz, Michal Studniarek, Thierry Delachaux, Irène Cucchi, Jarmo Kalilainen, Felix Rager, Frank Kassubek, Matthias Bator
Corporate Research Center ABB Swtzerland Ltd

10253 *Secure Power Supply Of MV Grids - Neutral Isolated - By Means Of GE Directly Connected To Medium Voltage*
Luca Giansante, Fabrizio Gasbarri, Andrea Anesa, Francesco Amadei, Enrico Valigi
Enel Grids, Italy

10271 *Connection of Medium Voltage Cables with Conductor Temperatures up to 110 °C – Design of a "temperature Sink"*
Kai Bentkowski, Gert Stauch, Haim Klaus-Dieter
1: BBC Cellpack GmbH, Germany; 2: University of applied sciences Zittau, Germany

10294 *Adoption Of High Capacity Low Sag Conductors On High Voltage Power Lines*
Josè Manuel Lopez Villena, Roberto Emma, Remo Gingillino, Genis Egea Brufau, Fabrizio Gasbarri, Enrico Valigi, Francesco Amadei
ENEL, Italy

10309 *On the Adhesion Efficiency of the PE/resin and PVC/resin Interfaces for Low Voltage Joint Applications*
Mehdi Kanoun, Marie-Laure Parussolo-Paupardin, Damien Veillot, Christophe Lin
1: EDF, France; 2: Enedis, France

10316 *Deep Learning-Based Automatic Detection of Defective Steel Bars in Concrete Poles*
Junhyeong Pak, Yoonbo Shim, Jonghyup Song, Sang Jun Kim, Jae Heon Lee, Sangoh Jeong
Korea Electric Power Corporation (KEPCO), South Korea

10322 *DC Electric Vehicle Charging Infrastructure – Methods for Periodic Verification*
Daniel Herbst, Martin Fürnschuß, Robert Schürhuber, Peter Reichel, Felix Lehfuß, Christian Auer, Ernst Schmautzer
1: Graz University of Technology, Austria; 2: OVE Austrian Electrotechnical Association, Austria; 3: AIT Austrian Institute of Technology, Austria; 4: KS Engineers, Austria; 5: ESC Graz, Austria

10325 *Adoption of Recycled Fiberglass Distribution Network Components. Background, Pilot Projects and Future Developments.*
Giovanni Rizzello, Jean Pierre Goossens Alayon, Enrico Valigi, Francesco Amadei, Fabrizio Gasbarri
Enel, Italy

10331 *Analysis Of Data Gathered During The Application Of LLPDs On MV Feeder Of E-distribuzione*
Luigi D'Orazio, Gianluca Di Felice, Jean Baptiste Frain, Amedeo Andreotti, Naganathini Ravichandran, Ivano Gentilini, Daniela Proto, Antonello Greco, Ludovico Spitilli
1: ENEL, Italy; 2: e-distribuzione, Italy; 3: Streamer, Switzerland; 4: University of Naples, Italy

10332 *Adoption Of Recycled and Bio-Based Material For Power Distribution Cables Manufacturing To Achieve A Significant Reduction In CO2 Emissions.*
Lucia Georgantellos, Jean Pierre Goossens Alayon, Enrico Valigi, Francesco Amadei
ENEL, Italy

10335 *Fault Ride Through Of DC Solid State Transformer In Medium Voltage DC Systems*
Pierre Le Métayer, Drazen Dujic, Cyril Buttay, Piotr Dworakowski
1: Supergrid Institute, 69621 Villeurbanne, France; 2: Univ Lyon, CNRS, INSA Lyon, Université Claude Bernard Lyon 1, Ecole Centrale de Lyon, Ampère, UMR5005, 69621 Villeurbanne, France; 3: Power Electronics Laboratory, EPFL, Lausanne Switzerland

10339 *New Tool For The Improvement Of Maintenance And Expected Life Monitoring Procedures Of Surge Arresters Installed On Overhead MV Lines*
Luigi D'Orazio, Gianluca Di Felice, Marina Bernardi, Stefano Malgarotti, Bruno Mario Ceresoli, Matteo Corti
1: ENEL, Italy; 2: CESI, Italy

10364 *A Novel Power Electronic Meshing Solution for Radial Medium Voltage Distribution Networks*
Bhargav Swaminathan, Benoît George, Aurel Garry
EDF R&D, France

10369 *Improvement Of Thermal Performance Of Medium Voltage Circuit Breakers By The Implementation Of Heat Pipes*
Philipp Masmeier, Michael Weuffel, Patrick Rumpelt, Oliver Baier
ABB AG Medium Voltage Products, Germany

10380 *TNB Distribution Network's Asset Management Strategy Future Outlook through Advanced Asset Analytics*
Muhammad Al Jundi Abdullah, Avinash Ashwin Raj Raja Gopal, Yogendra S. Balasubramaniam
1: Tenaga Nasional Berhad, Malaysia; 2: TNB Research, Malaysia

10392 *Digital Twins Used For Condition Assessment Of Transformer Fleets – The Challenges of turning Data into Reality*
Bastian Fischer, Dr Karsten Viereck, Christian Hofmeister
Maschinenfabrik Reinhausen GmbH, Germany

10395 *Validation Tests of Battery Based Mobile Generators for Islanding Operation During Works on the Distribution Grid*
Janailson Rodrigues Lima, Etienne Toutain, Ali El Akoum, Jeremy Leplus, Sebastien Cantet
1: EDF R&D, France; 2: Enedis

10400 *New Approach for Online Detection of Partial Discharges in Cable Systems via VDS Ports*
Manfred Bawart, Marco Engel
BAUR GmbH, Austria

10403 *Estimation Of The Parameters Of A LVAC Cable For A LVDC Grid Application*
Ferréol Binot, Frédéric Reymond-Laruina, Loïc Queval, Marc Petit
1: Centrale Lille - L2EP, France; 2: EDF R&D, France; 3: CentraleSupélec - GeePs, France

10434 *Low Cost, High Performance Monitoring System for Renewable Distribution Systems*
Thomas Gräf
Hochschule für Technik und Wirtschaft Berlin, Germany

10447 *Innovant Densimeter for GIS Tank, Insensitive to Temperature Variation*
Philippe Brun, Diego Alberto, Raimund Summer
1: Schneider Electric, France; 2: Schneider Electric, Germany

10466 *DC short-circuit Behaviour of LVAC Fuses*
Djamel Hadbi, Luis Chinchilla Delgado, Frederic Reymond-Laruina, Michel Cordonnier
1: EDF Lab les Renardières; 2: Enedis Direction technique

10467 *Impacts of Low Voltage Distribution Grid Resilience Constraintes on AC/DC Converter Sizing*
Frédéric Reymond-Laruina, Marc Petit, Loïc Queval, Djamel Hadbi, Philippe Egrot, Michel Cordonnier, Stéphane Mercier
1: EDF Lab les Renardières; 2: Laboratoire de Génie Electrique et Electrotechnique de Paris; 3: Enedis Direction technique; 4: Socomec

10469 *Alternative Solutions Considered by Enedis to Reduce Electrical Equipment Carbon Footprint Within the Framework of a Global Environmental Approach*
Franck Gaillard, Florimond Soriano, Mamadou-Lamine Coulibaly, Djamel Hadbi, Jean-Pierre Gontier
1: EDF Lab les Renardières; 2: Enedis Direction technique

10470 *Sensitivity Evaluation of Partial Discharge Measurement Method for XLPE Cable Joint*
Ryo Shutani, Shin-ichi Kobayashi, Tomoya Ogawa, Yuki Wakabayashi
Chubu Electric Power Grid Co., Inc., Japan

10484 *Influence of Low Power Transformers (LPVT) on the Results of VLF Diagnostic Tests on Medium Voltage Cables*
Hamed Rezaei, Axel Winter, Manfred Bawart
1: TE connectivity, Germany; 2: BAUR GmbH

10502 *A Generic and Scalable Dynamic Model for Stationary Battery Energy Storage Systems*
Julian Richter, Marc Sladek, Matthias Luther
Friedrich-Alexander-Universität Erlangen-Nürnberg, Institute of Electrical Energy Systems, Germany

10505 *Cost Efficient Management Of Digital Secondary Substations, On The Example Of The Process Interface And Detection Unit (PIDU)*
Andreas Hettich, Fabian Zehner, Gerald Jacob, Christian Ruester
1: Netze BW GmbH, Germany; 2: A. Eberle GmbH & Co. KG, Germany

10533 *Acquisition And Evaluation Of The Breakdown Voltage As A Result Of The Layout And The Statistical Spread Of Vacuum Gaps*
Patrick Rumpelt, Michael Weuffel, Thomas Schmölzer
ABB AG, Electrification – Distribution Solutions business line

10537 *Fault Location System for MV Distribution Underground Network*
Francisc Zavoda, Luc Provencher, Sébastien Leprohon, Frédéric Gervais, Dany Oielett
1: CRHQ (Centre de recherche d'Hydro-Québec), Canada; 2: Hydro-Québec

10557 *Influence of Magnetic Fields to the Arc in a Polymer Materials Pipe*
Kiryu Terada, Tadashi Koshizuka, Kunihiko Hidaka
Tokyo Denki University

10584 *Hydrogen Filled DC Circuit Breakers for Electrical Vehicles Batteries*
Pedro Sanchez, Araitz Iturregi, Diego Gonzalez, Pablo Eguia, Roman Fuchs
1: University of the Basque Country UPV/EHU, Spain; 2: Leibniz Institute for Plasma Science and Technology INP Greifswald, Germany; 3: Ostschweizer Fachhochschule, Switzerland

10586 *Evaluation And Research Trends On Controlled Switching And Transients Mitigation*
Simone Carnì, Marco Riva, Simone Negri, Roberto Sebastiano Faranda
1: ABB S.p.A., Italy; 2: Politecnico di Milano, Italy

10595 *Distribution Transformer Ageing: Possible Load Increase on an Actual Use Case*
Nathalie Barnel, Michel Cordonnier, Marie Laure Parussolo-Paupardin
1: EDF, France; 2: ENEDIS, France; 3: EDF, France

10596 *Sustainable Power Transformers: Enel Grids use of natural ester insulating fluid in large power transformers*
Miguel Angel Caballero, Marianna Rizzo, Juan Manuel Rey, Flavio Mauri, Fabrizio Gasbarri, Enrico Valigi, Francesco Amadei
Enel Grids

10610 *Development of Underground Cable for Low Voltage DC of 1MW Class*
Youngpyo Cho, Junwoo Lee, Seokwoong Kim, Juyong Kim
KEPCO Research Institute, South Korea

10611 *Monitoring And Rating Of The Low Voltage Grid Utilization*
Jonas Claus, Günter Schulz, Markus Kosch, Thomas Schwierz, Christian Rehtanz
1: ct.e Controltechnology Engineering GmbH, Germany; 2: AVU Netz GmbH, Germany; 3: Institute of Energy Systems, Energy Efficiency and Energy Economics, TU Dortmund, Germany

10641 *"Improvement of Lightning Resistance for Distribution Facilities"*
Uki Kanenari, Junki Oasa, Yuusuke Nishihiro, Tsuyoshi Iinuma, Noriaki Kano, Yuki Kawachi, Keisuke Morita
KANSAI Transmission and Distribution, Inc., Japan

10642 *Solving the Problem of Wooden Poles Ignition due to Insulator Contamination – In Theory and Practice*
Domagoj Milun, Dinko Marijan, Josip Srdanović
HEP DSO, Croatia

10648 *Modelling the Potential of Enhanced Capacity Transformers for Optimizing Material Efficiency and Asset Utilization*
Roberto Fernandez, Fernando Nuno, Alberto Cracco
1: Cargill Bioindustrial, Spain; 2: European Copper Institute; 3: Westrafo

10649 *World's First Enhanced-Cooled Dry-Type Transformer For Wind Off-Shore*
Mariano Berrogain, Antonio Nogues, Muge Ozerten, Aitor Sanz, Juan-Pedro Gracia, Patricia Gonzalez
1: Hitachi Energy Spain SAU, Spain; 2: Hitachi Energy Ltd, United States; 3: Saitec Offshore Technologies S.L.U.

10652 *"End-To-End Testing" of Enedis' Smart Equipment for Secondary Substations*
Janailson Rodrigues Lima, Franck Serafini, Fabienne Montel-Ragu, Cedric Cholin, Mikaël Chochois
1: EDF R&D, France; 2: Enedis, France

10660 *Enel Grids Network Digital Twin®: The Foundation Layer Of Integrated Suite For Distribution Systems Design*
Massimo Maffeis, Roberto Casavecchia, Andrea Casini, July Marcela Aparicio Cabrera, Mario Larcher, Antonio Nappi, Michele Portas, Federico Pollacchini, Mario Fernandez, Giovanni Franzone, Francesco Amadei, Fernanda A. Paletta Piovezan, Ignacio Garcia Bere
1: Enel Grids, Italy; 2: Enel Grids, Colombia; 3: Enel Grids, Spain; 4: Gridspertise; 5: Enel, Italy

10679 *Vacuum Interrupter With Rmf Contacts: Arc Movement Observation And Modelling To Master Electrical Endurance*
Jerome Douchin, Anthony Papillon, Jean-Pierre Gauthier
Schneider Electric, France

10685 *Rethinking Data Requirements For The Reliability Assessment Of Medium Voltage Cables*
Konrad Sundsgaard, Jens Zoëga Hansen, Guangya Yang
1: Green Power Denmark; 2: Technical University of Denmark

10687 *On-line Monitoring Condition of On-load Tap Changer of Power Transformers*
Mauricio Cuevas, Damien Bortolotti, Mohammed Zouiti
1: EDF, France; 2: ENEDIS, France

10699 *Diagnostic Techniques Of MV Cable Joints Under Different Environmental Conditions*
Giovanni Pirovano, Johnny Borghetto, Alfredo Contin, Andrea Morotti, Andrea Pegoiani, Samuele Forciniti
1: RSE, Italy; 2: University of Trieste, Italy; 3: Unareti, Italy

10700 *Predictive Maintenance On Overhead Medium Voltage Network Using Transient Faults Data*
Odilon Faivre, Martial Joseph, Jérémie Mérigeault, Ilyes Kabbourim, Alain Tholon, Nicolas Bailloeuil
Enedis, France

10713 *Innovative Distribution Automation for Low Voltage Networks to accomplish the new challenges arising from the energy transition*
Miren De la Cruz Tovar, Iñaki Apellaniz, Juan José Carmona, Roberto Martinez, Javier Cormenzana, Koldobika Zuazo
Ormazabal, Spain

10719 *The Impact Of The Joint Pending Time On Its Support Regarding Its Electrical Properties*
Marie-Laure Parussolo-Paupardin, Mehdi Kanoun, Housssam Tanzeghti, Christophe Lin
1: EDF R&D, France; 2: Enedis, France

10723 *Improvements on the Automatic Assessment of the Reliability of Distribution Grids Through Online Condition Monitoring*
Giacomo Ciotti, Andrea Caprara, Paolo Pieroni
Techimp - Altanova group, Italy

10730 *Study Of Surge Protection In MVDC Networks Using A Solid-State Breaker/Limiter*
Alessio Clerici, Riccardo Chiumeo, Diego Raggini, Alessandro Veroni
RSE spa, Italy

10743 *Online Automated System for Incipient Fault and Failure Detection of Distribution Apparatus Using Waveform Disturbances*
Jeffrey Wischkaemper, B. Don Russell, Carl Benner, Karthick Manivannan
Texas A&M University, United States of America

10745 *Secondary Material Analysis*
Luca Marcolongo, Gozde Kaya Avsar
ABB SpA, Italy

10763 *Smart Secondary Substation development and demonstration under FLEXIGRID project*
JON Aguirre Valparis, Alejandro Blasco, Miguel Alvarez, Antonio González
1: ORMAZABAL, Spain; 2: EDP REDES ESPAÑA

10774 *Standardized Rules For Environmentally Conscious Design And Assessments Of Electrical Equipment*
Thierry Cormenier, Roselyne Thai, Takako Hiruta, Martial Patra, Pauline Mourlon, François Trichon, Dominique Serve
1: Schneider Electric, Lattes, France; 2: Schneider Electric, Grenoble, France; 3: Schneider Electric, Tokyo, Japan; 4: Schneider Electric, Paris, France

10778 *How To Build Catalogue Data For Digital Twins Of High-Voltage Switchgear*
Thierry Cormenier, François Trichon, Dominique Serve, Mayank Sharma, Tom Berry
1: Schneider Electric, Lattes, France; 2: Schneider Electric, Grenoble, France

10784 *Silicon Carbide Enabled Medium Voltage DC Transmission Systems for Rapid Electric Vehicle Charging in the UK*
Arkadeep Deb, Jose Ortiz-Gonzaelz, Ruizhu Wu, Saeed Jahdi, Walid Issa, Olayiwola Alatise
1: University of Warwick, United Kingdom; 2: Chongqing Jinkang E-powertrain, China; 3: University of Bristol; 4: Sheffield Hallam University

10795 *Life Cycle Assessment Of SF6 vs. Pure Air Medium Voltage Equipment*
Thierry Cormenier, Frederic Marty, Geoffrey Medjadj, François Trichon, Dominique Serve, Benjamin Canaguier, Raimund Summer
1: Schneider Electric, Lattes, France; 2: Schneider Electric, Grenoble, France; 3: Schneider Electric, Paris, France; 4: Schneider Electric, Regensburg, Germany

10805 *Fault Activity Trajectory Estimation – Time To Fuse Blow*
Samir Alilat, Jonathan Rodgers, Emilio Vicari, Davide Cagnoni, Francesco Sciocchetti, Irene Parigi
1: Kelvatek, United Kingdom; 2: Camlin Technologies; 3: Camlin Energy

10830 *A Review of Medium Voltage Vacuum Interrupter BIL Performance*
Stefan Micic, Blair Kerr, Kennedy Darko
G&W Electric Company, United States of America

10834 *Failure Statistic for Medium Voltage Cable Systems in Denmark*
Jens Zoëga Hansen
Green Power Denmark, Denmark

10865 *Automated Shunt Reactors For MV Feeders Upper Voltage Constraints*
Leonard Bacaud, Thibaud Sourty, Dany Tsoumtsa Yimdju, David Rottner, Michel Cordonnier, Jean-Pierre Gontier
ENEDIS, France

10867 *Real Time Live Line High Voltage Measurement of Instrument Transformer's Ratio and Phase Displacement Errors*
Uroš Kovačević, Vladeta Milenković, Nenad Kartalović, Miodrag Stojanović, Dusan Vukotic
1: Faculty of Mechanical Engineering, Innovation Center, University of Belgrade, Serbia; 2: Netico Solutions doo; 3: Electrical Engineering Institute Nikola Tesla; 4: University of Niš, Faculty of Electronic Engineering; 5: DSO, ELektrodistribucija Srbije

10868 *Avoiding Uncertanties on Safety and Reliability in 24kV SF6 Free Secondary Distribution Switchgear*
Jose Manuel Inchausti, Joseba Arostegui, Sergio Sebastián
Ormazabal, Spain

10890 *Environmental Issues of SF6-Free Gas Insulated Switchgear*
Eivind Gramme
Lede, Norway

10894 *Natural Origin Gases & Vacuum Interrupter – A Reliable and Sustainable Alternative to SF6 Medium Voltage Gas Insulated Switchgear*
Karthik Reddy Venna, Christophe Preve, Manjunath Ramesh, Frits Besseling
1: Siemens AG, Germany; 2: Schneider Electric, France; 3: Nuventura, Germany; 4: Eaton, Netherlands

10897 *Direct Current Circuit Breaker With Adjustable Current Injection*
Wolfgang Grieshaber, Dan-Lucius Penache, Yang Yang, Florent Robert
SuperGrid Institute, Villeurbanne, France

10937 *Asset Management Prepared Smart Secondary Substation*
Ian Paul Gilbert, Juan Antonio Sanchez, Miren De La Cruz, Jon Aguirre, Iñaki Apellaniz
Ormazabal, Spain

10939 *Green Design with Amorphous Metal for Dry Type Distribution Transformers*
Kacey Lee, Radoslaw Szewczyk, Zhongdong Bai, Ning Li, Chengxiang Jin
1: DuPont Korea, South Korea; 2: DuPont Poland; 3: CEEG China; 4: CEEG Chuna; 5: CEEG China

10954 *Improving the Earth Electrode of Pole Mounted Transformers_*
Malusi Mathonsi
Eskom SOC, South Africa

10994 *Analysis of Long-Term Effects During Development of SF6-free Gas Insulated Switchgears*
Achim Kalter, Dominik Becht, Karsten Esser-Rank, Patrick Halbach, Thomas Hammer, Hansgeorg Haupt, Bastian Woelke
1: Siemens AG, Germany; 2: TU Darmstadt, Germany; 3: Westnetz GmbH, Germany

10998 *MADELAINE – A Multi-Adaptive and Cost-Efficient DC Charging System for EV Car Parks*
Daniel Stahleder, Stephan Ledinger, Florian Mader, Dominik Hartmann, Markus Litzlbauer, Manuel Schmutz, Felix Lehfuss
1: AIT Austrian Institute of Technology, Austria; 2: WEB Windenergie; 3: ENIO

11000 *Low-Voltage Network Point Measurement And Monitoring*
Sudipta Saraswati, Mukesh Hingar, Jayant Kamra
Secure Switzerland AG

11014 *Partial Discharge Measurement of Polymer Insulator under Artificial Contamination*
Bikash Kafle, Elin Fjeld
1: Kathmandu University, Nepal; 2: University of South-Eastern, Norway

11027 *Field Experience of On-site Cable Testing of 66 kV Offshore Array Cables*
Uwe Kaltenborn, Olaf Schacht, Christopher Donaghy-Spargo, Alex MacPhie
1: HIGHVOLT Prüftechnik Dresden GmbH, Germany; 2: JDR Cable System Ltd.

11029 *Distribution Smart Transformer with an Innovative OLTC Switching Technology for LV Grid Real Time Operation*
Pablo Cirujano, Ibon Larracoechea, Luis Del Río Etayo
Ormazabal

11045 *Recent superconducting cable installation in Chicago paves the way for a Resilient Electric Grid (REG) system*
Arnaud Allais, Nicolas Lallouet, Jean-Maxime Saugrain, Beate West, Erik Marzahn, Frank Frentzas, Mike Ross
1: Nexans, France; 2: Nexans, Germany; 3: American Superconductor, USA; 4: COMED, USA

11050 *Requirements For Large Scale Battery Storages In Low Voltage Grids - Lessons Learned From A Smart Grid Project.*
Navreet Dult, Benjamin Petters
Avacon Netz GmbH, Germany

11052 *Diagnostic Tools (DGA) for Resilient Transformers with Aramid-Based Insulation Systems*
Radoslaw Szewczyk, Jean-Claude Duart, Helena Wilhelm, Paulo Fernandes
1: DuPont; 2: Vegoor Tecnologia Aplicada

11056 *A Simplified Tool For The Life Cycle Analysis Of A Medium Voltage Switchgear*
Teresa Bas, Jesus Izcara, Iñigo Aizpuru, Jose Ramon Tejedo
1: Iberdrola Distribucion Electrica; 2: Ormazabal; 3: Ihobe

11059 *Superconducting Systems, a New Tool for Railway Power Grids*
Jean-Maxime Saugrain, Arnaud Allais, Hervé Caron
1: NEXANS, France; 2: SNCF, France

11083 *Cyclic Loadability Of Entire HV/MV-Substations*
Jur Erbrink, Rory Leich, Robert Vosse, Sjoerd Nauta, Jurriaan Smit
Alliander, The Netherlands

11094 *Inrush-Currents of Series Combination of Transformer with in-phase Regulation and Phase Shifting Transformer at the Interface between Transmission and Distribution Networks*
Jiachen Bai, Fekadu Shewarega, Hendrik Vennegeerts, Roman Lechner, Günter Etz, Markus Unterholzer-Moser
1: University Duisburg-Essen, electrical Energy Systems (eES), Germany; 2: Netz Niederösterreich GmbH, Austria; 3: Austrian Power Grid (APG), Austria

11108 *Thermal Performance For Three-Windings Transformers With Axially Stacked Windings*
Pablo Pacheco Ramos, Jason Varnell, Miguel Martinez Ronderos, Inna Gerasimova, Esther Esteban Cabellos, Sergey Snagovskoy
1: DOBLE ENGINEERING, United States of America; 2: IBERDROLA, Spain; 3: FARAMAX TRAFO, Spain

11116 *What Should DSOs Focus On For Reducing The Impacts On Climate Change When Developing And Operating Electricity Networks? A Case Study Of The Power Distribution Network In A Rural Area In Central Norway*
Regina Skattenborg, Irmeline de Sadeleer, Anne Rønning
NORSUS, Norway

11126 *Non Intrusive Repair Of a Belgrade Fluid Filled Cable With a Self-healing Dielectric Fluid*
Rhys Rhodes, Maggie Svensson, Henryk Herman, Gary Stevens, Christopher Miners, Siddharth Uppal, Christian Kretzschmar, Pane Ivetic, Branko Dordevic, Mirko Borovic, Ivana Mitic
1: Kinectrics UK Ltd, United Kingdom; 2: Energi Cable Engineering, United Kingdom; 3: NKT, Denmark; 4: MINS Elektro, Serbia; 5: Elektromreza Srbjie, Serbia

11140 *Deploying Intelligent PD Monitoring Solutions In Distribution Grid*
Javier Ortego, José David Bielva, Antonio González, Ruben García, Fernando Garnacho
1: Ampacimon; 2: EDP Redes España; 3: Universidad Politécnica de Madrid; 4: FFII-LCOE

11145 *Hybrid Power Solution Modelling Based on Artificial Intelligence*
Antonin Colot, Bertrand Bastin, Bastien Ewbank, Fabrice Frebel, Benoit Bidaine, Bertrand Cornelusse
1: CE+T Power, Belgium; 2: ULiège - Belgium

11164 *Virtualization and Management Technologies of Smart Substations*
Carsten Krüger, Jirapa Kamsamrong, Sebastian Lehnhoff
OFFIS e.V., Germany

11167 *Lifetime Extension Options for Electrical Equipment*
Lina Bertling Tjernberg, Stephanie Uhrig
1: KTH, Sweden; 2: HM Hochschule München University of Applied Sciences, Germany

11171 *Smart Bushing PD Sensor Testing for Switchgear Application*
Abbas Ghaderi, Lorenzo Peretto, Elisa Scala, Andrea Nalli, Mattewos Tefferi, Nenad Uzelac, Ana Milosevic, Nenad Kartalovic
1: University of Bologna, Italy; 2: G&W Altea, Italy; 3: G&W Electric Co. USA; 4: Electrical Engineering Institute Nikola Tesla, Serbia

11175 *Improve Operator Safety and Protect Wildlife in Overhead Distribution Networks*
Iban Landeta Zarate, Iñaki Apraiz Alvarez, Juan Carlos Pérez Quesada, Mikel Irizar Moyua
1: Schneider Electric (MESA PLANT), Spain; 2: Iberdrola, Spain

11182 *Simulation Study and Field Experience from Switching of Transformer with Minimal Inrush Current*
Elisabeth Lindell, Andrea Bianco, Stefan Halén, Carlo Taborelli
1: ABB AB, Sweden; 2: ABB S.p.A., Italy

11282 *A Smart Meter Based Charging System for Public EV Charge Points*
Anish Babu, Ryan Sims, Federico Coffele
University of Strathclyde, United Kingdom

11289 *Realising the Benefit of Short-Term Post-Fault Ratings using Smart OHL Sensors for Increased DER Integration*
Samuel Jupe, Liza Troshka, Samuel Casallas, Sven Hoffmann
1: Nortech Management Limited, United Kingdom; 2: National Grid Electricity Distribution, United Kingdom

11291 *Capacitive Transfer System Cable for Efficient Power Delivery in a 33kV Distribution System*
Alexander Yanushkevich, Edward Mair, Mansour Salehi-Moghadam
Enertechnos, United Kingdom

11317 *Lessons from the Installation and Commissioning of Novel Power Electronics for Active Response*
Brendan Page, Andrew Burton
1: Ricardo Energy and Environment, United Kingdom; 2: UK Power Networks, United Kingdom

11331 *Partial Discharge Characterization Through Innovative Continuous Monitoring of Medium Voltage Substation*
Diana El Khoury, Maxime Durand, François Gentils, Davide Fabiani
1: Schneider Electric Industries SAS, France; 2: University of Bologna, Italy

11338 *Advanced Switchgear Diagnostics Through PD Monitoring Correlated With Environmental And Operating Parameters*
Diego Alberto, Diana El Khoury, Andrea Cavallini, Emiliano Centenaro, Venanzio Ferraro
1: Schneider Electric Industries SAS, France; 2: University of Bologna, Italy

11341 *Standardization of Smart Distribution Substations in Cologne*
Stephan van der Broeck, Sigrid Plötz, Mirko Wahl, Judith Schramm, Ulrich Groß
Rheinische NETZGesellschaft mbH, Germany

11350 *Polymeric Composite Crossarms as an Alternative to a Traditional Metallic Solution on E-REDES Medium Voltage Overhead Networks*
Pedro Sá Furtado, Jorge Mendes Santos, Hilário Lopes, Filipa Capela
E-REDES, Portugal

11366 *TNB Experience in The Use of Smart Meter For Real Time Monitoring on The Thermal Performance of In-Service Distribution Transformer*
Young Zaidey Yang Ghazali, Mohd Azhar Abd Aziz
1: Tenaga Nasional Berhad, Malaysia; 2: TNB Research Sdn. Bhd., Malaysia

11372 *20 Years Of Birdlife Protection At E-REDES*
Filipa Capela, Inês Cândido Silva, Vitor Batista, Jorge Mendes Santos, Pedro Sá Furtado, Inês Gomes, Sílvia Monteiro
1: E-REDES - Distribuição de Eletricidade S.A., Portugal; 2: EDP - Energias de Portugal S.A, Portugal

11397 *Monitoring of Gas Evolution of Power Transformers Integrating Nanotechnology and Intelligent Techniques*
Camila Albertin, Floriano Neto, Vagner Vasconcellos
1: CPFL Paulista, Brazil; 2: CPFL Geração de Energia S.A; 3: CPFL Paulista, Brazil

11407 *Core Vibration Modelling for Secondary Distribution Transformers*
Andre Würde, Jannis Nikolas Kahlen, Albert Moser
1: IAEW, RWTH Aachen, Germany; 2: Umlaut SE, Germany

11433 *Insight In The MV-grid With Low Effort Accurate RMU Retrofit Measurement To Accelerate Hosting Capacity And Energy Transition.*
Wouter van den Akker, Denny Harmsen, Martin Binnendijk, Elise Morskieft, Gerard Schoonenberg, Peter Meijer
1: Alliander; 2: Eaton

11435 *Evaluation Of Novel Corrosion Protected Aluminium Earth Wire For Use In Underground Cable Networks*
David Söderberg Erdal, Ingvar Hagman, Christian Andersson, Dietmar Gleich, Anders Persson
1: Vattenfall Eldistribution AB, Sweden; 2: NKT (Sweden) AB; 3: Dala Energi AB

11437 *Zero-Sequence Blocking Transformers For Use In MV Distribution Systems – Design Comparison Of Single-Core Vs Multi-Core Designs*
David Söderberg Erdal, Maarit Juhola
1: Vattenfall Eldistribution AB, Sweden; 2: KKM Power OY, Finland

11469 *Distributed Smart Soft Open Point*
Wenlong Ming, Jinlei Chen, Jianzhong Wu, James Yu, Ali Kazerooni, Ranit Edgar, Alastair Ferguson
1: Cardiff University, United Kingdom; 2: Scottish Power Energy Networks; 3: Polaris Diagnostics & Engineering Ltd

11472 *Hardware of Aerial Distribution Networks, for Use on the Seashore, Corrosion Resistant, Corona Discharges and Leakage Current*
Alessandro P Dadam, Geraldo R de Almeida, Walter Pinheiro, Simone C N Araujo
1: Celesc Distribuição S.A., Brazil; 2: Tag Inovacao Tecnologica

11483 *Life-Expectance Evaluation for SF6-free Switchgear using C4-FN Mixtures*
Andres Laso Rubio, Ian Mainwaring, Traci Yeaton, Kennedy Darko, Nenad Uzelac, Karen Mann
G&W electric, United States of America

11504 *Battery Energy Storage System with Second Life EV Batteries*
Camila Omae, Vitor Arioli, Aghatta Moreira, Victor Riboldi, Nathalia Freitas, Ricieri Ohashi
1: CPFL ENERGIA, Brazil; 2: CPQD, Brazil

11517 *Vibration-Based Extraction of Switching Times for Circuit Breaker Monitoring Using Machine Learning*

Aydin Boyaci, Ido Amihai, Simon Penner, Vadim Migunov, Theresa Loss, Maurizio Zajadatz, Michael Suriyah, Thomas Leibfried, Nico Seidel
ABB AG Corporate Research Center Germany, Germany

Session 2 : Power Quality & Electromagnetic Compatibility

10121 *Harmonics in the Transmission and Distribution Grid and their Relation to Geomagnetically Induced Currents*
Alexandre Malfoy, Roger de Oliveira, Sarah Ronnberg
1: Bordeaux Institute of Technology - ENSEIRB - MATMECA; 2: Luleå University of Technology

10130 *Case Studies of Estimation of Harmonics in partly monitored Residential Networks*
Pablo Rodríguez-Pajarón, Araceli Hernández, Yuqi Zhao, Jovica Milanovic
1: Universidad Politécnica de Madrid, Spain; 2: The University of Manchester

10131 *Analysis of Harmonic Current Injections of Electric Vehicles*
Pablo Rodríguez-Pajarón, Leo Casasola, Alberto Contreras, Araceli Hernández, Jovica Milanovic
1: Universidad Politécnica de Madrid, Spain; 2: The University of Manchester

10142 *Transfer of Supraharmonics through a MV/LV Transformer*
Tim Slangen, Erik de Jong, Vladimir Cuk, Sjef Cobben
1: Eindhoven University of Technology, Netherlands; 2: KEMA Labs, Netherlands

10157 *Harmonic and Supraharmonic Emissions of Fast Charging Infrastructure – Field Measurements in LV Grids*
Manuel Wingenfelder, Daniela Frank, Constantin Reese, Lutz Hofmann
1: Leibniz University Hanover, Institute of Electric Power Systems, Electric Power Engineering, Germany; 2: enercity AG, municipal utilities Hanover

10176 *Minimization Strategies Of Harmonics in Microgrid Connected Wind-Driven PMSG*
Maged Nashed, Mona Eskander
Electronic Research Institute, Egypt

10179 *Comparative Study of Unipolar and Bipolar Industrial DC Microgrids Through Linear Power Flow*
Eduardo Vasquez Mayen, Emmanuel De Jaeger
UCLouvain, Belgium

10181 *Advanced Techniques For Troubleshooting Solar Arrays And Generator Connections*
Robert Weller, Kate Edwards, Duncan Dalton
1: Electrical Investigation Ltd, United Kingdom; 2: Outram Research, United Kingdom

10196 *Power Quality Impact on Light Intensity and Flicker Sensitivity of LED Lamps*
Elena Gutierrez-Ballesteros, Sarah Rönnberg, Aurora Gil-de-Castro
1: Luleå University of Technology, Sweden; 2: Universidad de Córdoba, Spain

10197 *Transient overvoltages caused by four pole Miniature Circuit Breakers (MCB) in three-phase circuits*
Kristof Vliegen, Quentin Antoine
1: Fluvius, Belgium; 2: ENGIE Laborelec, Belgium

10199 *Impact of MCB Transient Overvoltages on Household Appliances*
Quentin Antoine, Kristof Vliegen
1: ENGIE Laborelec, Belgium; 2: Fluvius, Belgium

10200 *Comparing Methods to Mitigate The Effect of Grid Voltage Sag And Frequency Variation on The Operation of Variable Speed Drives*
Maged Nashed, Mona Eskander
Electronic Research Institute, Egypt

10202 *The Impact of a Bi-directional V2G Electric Vehicle Charging Station to the Frequency Dependent Grid Impedance (10 – 150 kHz)*
Bernhard Grasel, José Baptista, Manfred Tragner, Subin Puthenkalam
1: FH Technikum Wien, Austria; 2: University of Trás-os-Montes and Alto Douro; 3: Magna International

10213 *Medium Voltage Cable Network in the Mountains – Verification of the Earth Potential Rise Voltage by Calculation*
Christoph Groiß, Katrin Friedl
1: Salzburg Netz GmbH, Austria; 2: TU Graz, Austria

10229 *Requirements For Grid Supporting Inverter In Relation With Frequency And Voltage Support*
Carina Lehmal, Ziqian Zhang, Herwig Renner, Robert Schürhuber
Graz University of Technology, Austria

10269 *Assessment of Technical Feasibility of Non-Invasive Measurement of Grid-Side Harmonic Impedance on Low-Voltage Networks*
Shrinath Kannan, Jan Meyer, Peter Schegner
TU Dresden, Germany

10270 *Continuous Non-invasive Resonance Detection in Residential Low-Voltage Networks*
Shrinath Kannan, Jan Meyer, Peter Schegner
TU Dresden, Germany

10288 *Evolution Of Earthing Impedance*
Quentin Antoine, Sophie Van Wynendaele, David Decoux, David Valmacco, Bastien Noël
1: ENGIE Laborelec, Belgium; 2: Ores, Belgium; 3: Resa, Belgium; 4: Sibelga, Belgium

10289 *Impact of Protective Multiple Earthing (PME) in TN-C Earthing Schemes in Public Low Voltage Networks*
Quentin Antoine, Kristof Vliegen, Wouter Dierckx, Henri Grandjean, Bastien Noël, Minh-Duc Hoang
1: ENGIE Laborelec, Belgium; 2: Fluvius, Belgium; 3: Ores, Belgium; 4: Sibelga, Belgium; 5: Resa, Belgium

10302 *The Propagation Behaviour of Surge Voltages on Public Low-Voltage Networks and the Consequences for Insulation Coordination*
Florian Heremans, Kristof Vliegen, Quentin Antoine, Sophie Van Wynendaele
1: ENGIE Laborelec, Belgium; 2: Fluvius, Belgium

10318 *Explainable AI-based Intelligent Approaches for Power Quality Prediction in Distribution Networks Considering the Uncertainty of Renewable Energy*
Haesung Lee, Hanmin Lim, Byungsung Lee
KEPCO Research Institute

10324 *Deep Learning Graphical Tool Inspired by Correlation Matrix for Reporting Long-term Power Quality Data at Multiple Locations*
Roger de Oliveira, Naser Nakhodchi, Rafael Salles, Sarah Ronnberg
Luleå University of Technology, Sweden

10334 *Influence Of Current Flowing On The Sheaths During The Standard Conditions And Preconditioning Of Hot Spots Of Joints*
Luigi D'Orazio, Alberto Cerretti, Alessandro Fatica, Niccolò Corsi
1: ENEL, Italy; 2: e-distribuzione, Italy

10356 *The Benign Earthing System: A New Method to Classify the Earthing of Substations*
Christian Ehlert, Christin Schmoger
1: Avacon Netz GmbH, Germany; 2: E.DIS Netz GmbH, Germany

10367 *Power Quality Benchmarking*
Denisa Galzina
HOPS, Croatia

10368 *Application of Artificial Neural Networks for Overhead Distribution Lines Magnetic Flux Density Estimation*
Ajdin Alihodzic, Adnan Mujezinovic, Emir Turajlic, Nedis Dautbasic, Maja Muftic Dedovic
University of Sarajevo - Faculty of Electrical Engineering, Bosnia and Herzegovina

10374 *Determining Faults Cause Based On Disturbance Records From PQ Monitors*
Irena Sagovac, Marijan Lukac
HEP ODS d.o.o. Elektra Zagreb, Croatia

10417 *Deep Learning for Power Quality with Special Reference to Unsupervised Learning*
Roger de Oliveira, Rafael Salles, Sarah Ronnberg
Luleå University of Technology, Sweden

10428 *Impedance Characteristics at Socket Outlets in Residential and Commercial Buildings in the Frequency Range 2-150 kHz*
Victor Khokhlov, Robert Stiegler, Jan Meyer, Stefano Lodetti, Peter Davis, Paul Wright, Igor Fernandez, Jon Gonzalez-Ramos, Alexander Gallarreta, David de la Vega
1: Technische Universität Dresden, Germany; 2: National Physical Laboratory (NPL), United Kingdom; 3: University of the Basque Country (UPV/EHU), Spain

10431 *Operation of Micro Sources and Impact of High Penetration on Low Voltage Distribution Grid*
Martin Kaspirek, Martin Kurfirt, Tomas Valta, Daniel Kouba, Zdenek Maca
EG.D (E.ON group), Czech Republic

10433 *Power Quality Survey in Industrial Zones in Alexandria*
Ihab Elfiky, Mohamed Elhoseiny, Hanaa Karawia
Alexandria Electricity Distribution Company, Egypt

10443 *Earth Resistivity Tomography Simulations Over An Earthing System*
Benjamin Jauk, Robert Schürhuber, Katrin Friedl
Graz University of Technology, Austria

10444 *The First Outlook on The Implementation of Groundless Lightning Arrester in Indonesia, Case Study: East Nusa Tenggara Province, Indonesia*
Hendra Aditia, Ragil Wicaksana, Yuniarto Prayitno, Revi Aldrian, Akbar Swastika
PT PLN (Persero), Indonesia

10463 *Effective Lightning Mitigation Method on Unshielded Distribution Line by Using High Charge Ratings Externally Gapped Line Arresters (EGLA)*
Florent Giraudet, Partal Ertugrul, Murat Serkan Sert, Meric Ger
1: METARRESTERS, Consultant, Germany; 2: ADM Elektrik Dağıtım, Distribution System Operator, Turkey

10483 *Analysis and Modelling of Temporary Overvoltage Events and Comparison with OVRT Requirements*
Christoph Wirtz, Max Murglat, Simon Krahl, Albert Moser
1: FGH e.V., Aachen, Germany; 2: IAEW RWTH Aachen University, Aachen, Germany

10493 *Monitoring Voltage Quality in Sweden*
Herlita Bobadilla Robles, Albin Emanuelsson, Abdirizak Aden, Carl Johan Wallnerström
Swedish Energy Markets Inspectorate, Sweden

10503 *Sensitivity Of Household Appliances To Supply Voltage*
Dumitru Mecineanu, Ludovic Bertin, Aurel Garry, Nicolas Carteau
1: EDF R&D, France; 2: Enedis, France

10513 *Harmonic Distortion in Microgrids in Islanded Operation*
Angela Espin-Delgado, Sarah Rönnberg
1: RISE Research Institutes of Sweden, Sweden; 2: Luleå University of Technology, Sweden

10525 *System Strength Measurement, Testing and Validation*
Daniel Gheorghe, Daniel Landreman, Poria Astero
1: Reactive Technologies Ltd, UK; 2: Eaton, USA; 3: Reactive Technologies, Finland

10531 *A Case Study on the Changes in Short Circuit Power to Analyze the Impact on Voltage Dips*
Joris Hoeksema, Roozbeh Torkzadeh, Jeroen van Waes, Sjef Cobben, Vladimir Cuk
1: Eindhoven University of Technology, The Netherlands; 2: TenneT TSO BV, The Netherlands

10536 *Practical Comparison Of Earth Impedance Testing Methods*
Josef Schmidbauer, Friedrich Almer, Moritz Pikisch
OMICRON electronics GmbH, Austria

10538 *Electric Vehicle Charging Stations and their Impact on Power Quality*
Francisc Zavoda
CRHQ (Centre de recherche d'Hydro-Quebec), Canada

10556 *Managing Distribution Network Stability with Penetration of Distributed Energy Resources*
Mohammad Rhaiz Abdul Aziz, Mohd Syahir Kyairi Ahmad Fuad, Hidzar Radzi Mohd Husin
Tenaga Nasional Berhad, Malaysia

10566 *Innovative High-Power Exiting Inverter for Frequency Dependent Grid Impedance Measurements*
Jakob Vellinger, Simon Schramm, Georg Kerber
HM Munich University of Applied Sciences, Germany

10578 *Techniques to Generate Test Waveforms for Power Grid Measurement Methods up to 150 kHz*
Alexander Gallarreta, Igor Fernández, Deborah Ritzmann, Stefano Lodetti, Victor Khokhlov, Jan Meyer, Paul Wright, David de la Vega
1: University of the Basque Country (UPV/EHU), Spain; 2: National Physical Laboratory (NPL), United Kingdom; 3: Technische Universität Dresden (TUD), Germany

10581 *Evaluation of the Light-QP Measurement Method for Extended Measurements*
Alexander Gallarreta, Jon González-Ramos, Igor Fernández, David de la Vega, Amaia Arrinda, Itziar Angulo
University of the Basque Country (UPV/EHU), Spain

10587 *Verification of Tool for Allocation of Harmonic Current Emissions Considering Frequency-Dependent Impedance*
Tor Inge Reigstad, Bjørn Inge Oftedal, Thor Holm, Bendik Nybakk Torsæter, Henning Taxt
1: SINTEF Energy Research, Norway; 2: REN AS; 3: PQA AS

10591 *A Study on the Application of Power Electronics Technology in Secondary Substation to Improve Power Quality*
Boo-Hyun Shin, Hye-seon Lee, Dong-yeol Shin, Soo-yong Hur, Sung-Min Kim
1: KEPRI / KEPCO, South Korea; 2: KEPCO, South Korea

10617 *A Case Study on the Introduction of Power Electronic Technology for Stabilization of Power System and Development of Phase Converter of Power Distribution System*
Hyeseon Lee, Boohyun Shin, Byungsung Lee, Sooyoung Hur, Sungmin Kim
KEPCO, South Korea

10618 *Impact of Reserve Market Participation on Power Quality of Flexibility Resources and Local Electricity Networks*
Antti Hildén, Pertti Pakonen, Joni Markkula, Eero Paavilainen, Mikko Kettunen, Pertti Järventausta, Pekka Verho
1: Tampere University; 2: Siemens Oy; 3: Lempäälän Lämpö Oy

10622 *Assessment of Harmonic Network Impedance through Transient Harmonic Signals measured at an Industrial Power System*
Tom Van Acker, Kris De Wit, Jose Antonio de la O Serna
1: BASF Antwerp NV, Belgium; 2: KU Leuven, Belgium; 3: Universidad Autonoma de Nuevo Leon, Mexico

10633 *The Beat Phenomenon and Flicker Caused by the Difference in Switching Frequencies between Two Grid-connected Inverters*
Kentaro Fukushima, Naotaka Okada
Central Research Institute of Electric Power Industry, Japan

10638 *Modelling of Voltage Unbalance in Large Real Medium Voltage Distribution Networks*
Adnan Bosovic, Herwig Renner, Andreas Abart, Ewald Traxler, Jan Meyer, Friedemann Möller, Mustafa Music
1: Public Electric Utility Elektroprivreda of Bosnia and Herzegovina d.d. - Sarajevo, Bosnia and Herzegovina; 2: Graz University of Technology, Austria; 3: Netz Oberösterreich GmbH, Austria; 4: Technische Universitaet Dresden, Germany

10640 *Steady-State Zero-Sequence Currents in a Transmission System: a Parameter Analysis*
Sjoerd Nauta, Jeroen van Waes, Leonel Noris, Kees Koreman
1: Alliander, The Netherlands; 2: TenneT TSO B.V., The Netherlands

10658 *Survey of Harmonic Distortion Measurements from Customer Grid Supply in Trains*
Rafael S. Salles, Sarah K. Rönnberg, Rebecca Asplund
1: Luleå University of Technology, Sweden; 2: Trafikverket, Sweden

10659 *Psophometric Indices Analysis for Waveform Distortion from Rolling Stocks in Electrified Traction Systems*
Rafael S. Salles, Sarah K. Rönnberg, Andrea Mariscotti
1: Luleå University of Technology, Sweden; 2: University of Genova

10662 *Large Scale Flexibility Requirements for Voltage Control in Low Voltage Distribution Network Analysis*
Blaž Dobravec, Viktor Andonovic, Nejc Petrovič
Elektro Gorenjska d.d., Slovenia

10665 *A Practical Method for Improving Low Voltage Ride-Through Capability of Inverter-based AC Microgrid*
Gary Chang, Kha T. Nguyen, Guan-Yi Li, Roberto Langella
1: National Chung Cheng University, Taiwan; 2: Univ. of Campania "Luigi Vanvitelli", Italy

10674 *Probabilistic Estimation of Harmonic Distortion in Non-Radial Distribution Network*
Yuqi Zhao, Jovica Milanović, Pablo Rodríguez-Pajarón, Araceli Hernández
1: the University of Manchester, United Kingdom; 2: Universidad Politécnica de Madrid, Spain

10680 *Evaluation of High Harmonic Components in the Residual Earth Fault Current with Regards to the Earth Potential Rise and Personal Protection*
Benjamin Küchler, Karla Frowein, Peter Schegner, Uwe Schmidt
1: Hochschule Zittau/Görlitz - University of Applied Sciences, Germany; 2: Dresden University of Technology, Germany

10683 *Methodology For The Evaluation By Simulation Of Electromagnetic Fields In Live Working Areas In Substations*
João Tarquínio, Andreia Leiria, Francisco Bessa Silva, José Manuel Cardoso, José Mendes Ribeiro
1: EDP Labelec; 2: EDP SA; 3: E-REDES

10703 *Analysing Electric Vehicle Charging Power Quality in Large-Scale Charging Sites – A Data-Driven Approach*
Toni Simolin, Antti Hildén, Pertti Pakonen, Pertti Järventausta
Tampere University, Finland

10733 *Harmonics Analysis for Distribution Systems of Urban Areas in Japan*
Naotaka Okada
CRIEPI, Japan

10742 *A Four-Leg Converter Control Scheme for Current Imbalance Compensation in Microgrids*
Simon Resch, Luther Matthias
Friedrich-Alexander Universität Erlangen-Nürnberg, Germany

10747 *Applying Machine Learning To Power Quality Signals To Detect Component Failure Signatures And Prevent Unplanned HV Outages*
Paul Morris, Andrew Forster, Samuel Jupe
1: National Grid Electricity Distribution, United Kingdom; 2: Nortech Management Limited, UK

10787 *Frequency-Dependent Impedance Identification For Lvdc Pq Analysis*
César Augusto Slongo, Xavier Yang, Octavian Curea, Manuel Billaud
1: EDF R&D, France; 2: ESTIA Institue of Technology, France; 3: Enedis, France

10831 *Analysing The Impact Of Operating Strategies Of Active Customers On Flicker And Voltage Unbalance*
Alexander Vanselow, Garn Till, Albert Moser, Bernd Engel
1: FGH e.V., Germany; 2: Technical University Brunswick; 3: RWTH Aachen University

10849 *Realistic Maximum Touch Voltages in Global Earthing Systems*
Katrin Friedl, Lothar Fickert, Benjamin Jauk, Robert Schürhuber
Graz University of Technology, Austria

10866 *Harmonic Phasor Measurement Technology from DC to 500 kHz with Time Resolution of a Single Line Cycle*
Jan-Philipp Kitzig, Gerd Bumiller
1: Ingenieurbüro Kitzig, Germany; 2: Hochschule Ruhr West, University of Applied Sciences, Germany

10879 *Supraharmonics Assessment: Methods Comparison Based on a Used Case in a Metalworking Shop*
Philippe Blanchard, Roger Bergeron, Manouane Caza-Szoka, Daniel Massicotte
1: Université du Québec à Trois-Rivières; 2: Les services Électrigénies

10893 *Modeling of Power Cables for Measurement Calibration and PLC Simulation up to 20 MHz*
Amaia Arrinda, Jon Gonzalez Ramos, Asier Herranz, Alexander Gallarreta, Igor Fernández, David de la Vega, Itziar Angulo
University of the Basque Country, Spain

10899 *Floating Neutral Detection Using a 2S Form Meter: Large Distribution Lines With Multiple Houses And Rooftop PV Effect*
Ibon Vicente, Lakshan Piyasinghe, Amaia Arrinda, J. Emilio Rodríguez-Seco
1: TECNALIA, Basque Research and Technology Alliance (BRTA), Spain; 2: Hubbell Inc., USA; 3: Unversity of the Basque Country, Spain

10935 *Solar Farm Earthing – Not Just an Extra-large Substation - Special Requirements Met by Risk-based Design and Focused Testing*
William Carman, Matthew Bale
1: Bill Carman Consulting, Australia; 2: Safearth Consulting, Australia

10942 *Switching Overvoltages Caused by Shunt Reactor Switching and Mitigation Methods*
Philipp Hackl, Katrin Friedl, Robert Schürhuber, Britta Heimbach, Bruno Wartmann, Andri Casura
1: Graz University of Technology, Austria; 2: ewz, Switzerland

10944 *Investigations Of 3D Meshed Earthing Systems*
Martin Fürnschuß, Stephan Pack, Ernst Schmautzer, Robert Schürhuber
1: Institute of Electrical Power Systems, Graz University of Technology, Austria; 2: Institute of High Voltage Engineering and System Performance, Graz University of Technology, Austria; 3: ESC Engineering Service & Consulting, Graz, Austria; 4: Institute

10947 *Does Transformer Inrush Challenge Future Grids? – Laboratory Insights*
Alexander Winkens, Florian Klein-Helmkamp, Markus Stroot, Mathias Knaak, Andreas Ulbig, Tilman Wippenbeck
1: RWTH Aachen University, Germany; 2: Westnetz GmbH, Germany

10969 *A Classification Of Grid Forming Converter Control And Its Application To Improve Power System Stability And Resilience*
Rebekka Denninger, Philipp Ernst, Sönke Rogalla, Bruno Burger
Fraunhofer ISE, Germany

10978 *Development of Measuring a Combined Impedance of Ladder Networks Using Unbalanced Current on Neutral Line in 4-wire Distribution System*
Dae Young Kim, Sunkyu Choi, Junhyuk Kang
KEPCO, South Korea

10993 *UK Grid Disturbances Measurements From 9 kHz To 150 kHz On A Low Carbon LV Network*
Peter Davis, Stefano Lodetti, Deborah Ritzmann, Paul Wright
National Physical Laboratory (UK), United Kingdom

11021 *Earthing Design of EV Charging Substations in Fuel Stations - UK Requirements and Experience*
Dionysis Skevis, Mark Davies, Denis Baudin, Stephen Tucker
1: RINA, United Kingdom; 2: UK Power Networks, United Kingdom

11023 *Impact of Discontinuous Measurements on the Trend Analysis of Power Quality Parameters*
Max Domagk, Jan Meyer, Karl Scheida, Rene Braunstein, Ewald Traxler, Roland Zoll
1: TU Dresden, Germany; 2: Oesterreichs Energie, Austria; 3: Energienetze Steiermark, Austria; 4: Netze Oberösterreich, Austria; 5: Wiener Netze, Austria

11024 *Managing Impressed Voltages Near High Voltage Installations - UK Requirements, Common Problems and Solutions*
Paul Jones, Mark Davies
RINA, United Kingdom

11028 *A New Algorithm to Estimate Uniform Soil Resistivity For Earthing Design Calculations*
Stephen Lilley, Paul Jones, Mark Davies, Stephen Tucker
1: RINA, United Kingdom; 2: UK Power Networks, United Kingdom

11067 *Effect of Time Delay of High-speed Autoreclosing on Variable Frequency Drives and Other Loads*
Pertti Pakonen, Ari Nikander, Pekka Verho
Tampere University, Finland

11079 *Modeling and Simulation of the Impact of a Fast Charging Infrastructure on Harmonic Disturbance Levels*
Sascha Müller, Jan Meyer, Julius Jacob
1: TU Dresden, Germany; 2: SachsenEnergie AG, Germany

11081 *Assessment of Harmonic Emission Level of Customer Installations Considering Actual Level of Cancellation*
Morteza Pourarab, Jan Meyer, Oliver Domianus, Thomas Naef, Max Ulrich, Roger Rölli
1: Technische Universitaet Dresden, Germany; 2: Camille Bauer Metrawatt AG, Switzerland

11084 *Analysis of the Propagation of Distortion in the Frequency Range 2-150 kHz using Iterative Harmonic Analysis*
Adam Collin, Roberto Langella, Alfredo Testa
1: The University of Sannio, Italy; 2: The University of Campania, Italy

11087 *Automated Load Control Detection Using Power Quality Data And Machine Learning*
Christina Brester, Antti Hildén, Mikko Kolehmainen, Pertti Pakonen, Harri Niska
1: University of Eastern Finland, Finland; 2: Tampere University, Finland

11088 *Supraharmonic In Low-Voltage Distribution Grids. Analysis Of the Specific Case Of The Interleaved Boost Converter*
Erzen Muharemi, Emmanuel De Jaeger, Jos Knockaert
1: UCLouvain, Belgium; 2: UGent, Belgium

11117 *Evaluation of Harmonic Transfer Between Transmission and Distribution Network Based on Measurements*
Robert Stiegler, Jan Meyer, Robert Dommerque, Mohammad Nazemi, Daniel Scherbarth
1: Technische Universität Dresden, Germany; 2: Amprion GmbH

11141 *Opportunistic Impact Of Simultaneous EV Charging On Stochastic Hosting Capacity*
Enock Mulenga, Taís T De Oliveira
1: Luleå University of Technology, Skellefteå, Sweden; 2: Luleå University of Technology, Skellefteå, Sweden

11146 *Power Quality Analysis of LVDC Distribution System using Real-time Simulator*
Seokwoong Kim, Jintae Cho, Youngpyo Cho, Hongjoo Kim, Wookwon Kim, Juyong Kim
KEPCO Research Institute, South Korea

11166 *A Study on VRE Grid Connection Code for LVDC System*
Junwoo Lee, Youngpyo Cho, Seokwoong Kim, Juyong Kim
Korea Electric Power Research Institute, South Korea

11186 *Solar PV Battery Storage Estimation For Overvoltage Mitigation Using Measurement Data*
Enock Mulenga, Taís T De Oliveira
1: Luleå University of Technology, Skellefteå, Sweden; 2: Luleå University of Technology, Skellefteå, Sweden

11191 *Harmonic Resonances Analysis Methods in Power Distribution Networks*
Leopold Herman, Jure Lokar, Bostjan Blazic
Faculty of Electrical Engineering, University of Ljubljana, Slovenia

11206 *New Interharmonic Subgroup Concept for Quantifying and Limiting Distortion in Distribution Networks: Further Developments and Experimental Validation*
Roberto Langella, Jiri Drapela, Mark Halpin, Jan Meyer, David Mueller, Harish Sharma, Alfredo Testa, Neville R. Watson, David Zech
1: University of Campania "Luigi Vanvitelli", Italy; 2: Brno University of Technology; 3: Auburn University; 4: Technische Universität Dresden; 5: EnerNex; 6: Southern Company Services; 7: University of Canterbury; 8: Duke Energy

11225 *Impact of Changing Frequency Standards on Grid-connected PV and Battery Inverters in the German Low Voltage System*
Johanna Geis-Schroer, Gregor Bock, Michael Suriyah, Thomas Leibfried
Karlsruhe Institute of Technology (KIT), Germany

11233 *Accurate Power Control of Grid forming Power Converters for Improving Large-Signal Stability*
Yousef Khayat, Peiyuan Chen, Massimo Bongiorno, Bengt Johansson
Chalmers University of Technology, Göthenburg, Sweden

11239 *Determination Of Frequency-Dependent Impedances Of Large 110 kV Grids*
Matthias Schilcher, Jonathan Hänsch, Frank Wirtz, Uwe Schmidt
1: Bayernwerk Netz GmbH; 2: Amprion GmbH; 3: Bayernwerk Netz GmbH; 4: E.cons Energiesystems Consulting GmbH, Germany

11269 *Artificial Expansion of Power Quality Datasets using Generative Adversarial Networks*
Markus Stroot, Katharina Alefs, Ömer Sen, Andreas Ulbig
1: IAEW at RWTH Aachen University; 2: Fraunhofer FIT; 3: RWTH Aachen University

11286 *Applicability of IEC derived Voltage Unbalance limits in the US Power System: A case study*
Gaurav Singh, Jan Meyer, Joseph Grappe, Anthony Murphy
1: Electric Power Research Institute, USA; 2: Technical University of Dresden, Germany; 3: Tennessee Valley Authority, USA; 4: Duke Energy, USA

11328 *Multimode Synchronous Resonance Detection in Converters Dominated Power System using Synchro-waveforms*
Taimur Zaman, Zhiwang Feng, Mazheruddin Syed, Benedikt Pilscheur Soraytec, David Flynn, Graeme Burt
1: University of Strathclyde, United Kingdom; 2: University of Glasgow; 3: Soraytec

11333 *Planning And Operation Of An Intelligent Voltage Regulator For PQ Improvement In PV-Rich Power Distribution Systems*
Rocco Di Gregorio, Stefan Hoppert, Riccardo Trevisan, Emilio Ghiani
1: Volta S.p.a.; 2: A-eberle GmbH; 3: Università degli Studi di Cagliari, Italy

11334 *New Approaches for Quantifying Impact of Power Quality Disturbances*
Jon Bickel, Daniel Sabin
1: Schneider Electric, United States of America; 2: Schneider Electric, United States of America

11347 *Radiated Emissions from an Electric Railway: Review of Methods and Measurements mainly from 9 kHz to 150 kHz*
Babak Sadeghi, Per Westerlund, Rafael S. Salles, Jonna Wilén
1: Luleå University of Technology, Sweden; 2: Umeå University, Sweden

11353 *Analysis of the Voltage Unbalance Phenomenon in a Three-phase Two-wire Distribution System*
Leonardo de Freitas Silveira, Aécio de Lima Oliveira, Ghendy Cardoso Junior, Gustavo Marchesan, Leyla Kraulich, Leonardo Felipe da Silva dos Santos, Miguel Spagnolo Martins, Rogimar Matias Rêgo
1: Universidade Federal de Santa Maria, Brazil; 2: Grupo Equatorial Energia / CEEE-D

11360 *Performance Evaluation of Instrument Transformers in Power Quality Measurements: Activities and Results from 19NRM05 IT4PQ Project*
Gabriella Crotti, Jan Meyer, Palma Sara Letizia, Mohamed Agazar, Daniela Istrate, Yeying Chen, Enrico Mohns, Helko van den Brom, Fabio Muñoz, Huseyin Cayci, Paolo Mazza, Robert Stiegler, Mario Luiso, Roberto Tinarelli, Alessandro Mingotti
1: Istituto Nazionale di Ricerca Metrologica (INRIM), Italy; 2: Technische Universität Dresden, Germany; 3: Laboratoire National de métrologie et d'Essais (LNE), France; 4: Physikalisch-Technische Bundesanstalt (PTB), Germany; 5: VSL B.V. (VSL), The Nethe

11362 *Impact Analysis Of Severe Weather Events In The Rest Of The Year KPI*
Andre Branco, Jose Sousa, Joao Cunha, Soraia Fernandes, Hugo Correia, Ricardo Santana, Bruno Gonçalves
E-REDES, Portugal

11431 *Investigating The Impact Of External Fields On The Accuracy Of LPVTs*
Roberto Schulze, Erik Sperling, David Gopp
OMICRON electronics GmbH

11448 *Evaluation On Safety Of People On Ground Generated Voltages In Unconventional Networks.*
Miguel Martins, Pedro Henrique Sebastiany, Roberta Stefanello, Leonardo Felipe Da Silva Santos, Leyla Kraulich, Leonardo De Freitas Silveira, Diego Ramos, Ghendy Cardoso Jr., Rogimar Rêgo
1: Universidade Federal de Santa Maria, Brazil; 2: Grupo Equatorial / CEEE-D

11450 *Investigation of Supraharmonic Emission from a Microgrid*
Mattewos Tefferi, Nick Nakamura, Gaurav Singh, Brad Barnes, Nenad Uzelac
1: G&W Electric, United States of America; 2: Powerside, United States of America; 3: EPRI, United States of America; 4: Ameren Illinois, United States of America

11464 *Analysis of Transmission Line Modelling in the MATLAB/Simscape Software Package*
Abdellatif Aboutaleb, Georgios G. Roumeliotis, Jan Desmet, Jos Knockaert
1: Ghent University, Faculty of Engineering and Architecture, Department of Electromechanical, Systems, and Metal Engineering, Research Group EELab/Lemcko, Kortrijk, Belgium; 2: Department of Electrical Engineering, Faculty of Engineering, Menoufia Univer

11515 *Power Quaility Monitoring-Based Distribution Network Characteristic Analysis Using Machine Learning*
Sang-Hwan Lee, Keon-Jun Park, Seong-Woo Kim, Sung-Yong Son
1: Gachon University, South Korea; 2: Korea District Heating Corporation, South Korea

11518 *Dynamic Reactive Power Compensation For Improved Mining Production*
Tomas Baeza, Peter Andersson, Filiph Appelgren, Jari Joona
Hitachi Energy

Session 3 : Operation

10109 *Hosting Capacity Improvement in Low Voltage Distribution Networks: A Risk-based Approach*
Zeljko Popovic, Neven Kovacki, Marko Obrenic, Branislav Brbaklic
1: University of Novi Sad, Serbia; 2: Schneider Electric, Serbia

10124 *Expansion of the Distribution Network Capacity by Monitoring low voltage Capacitors due to Changes in Topology*
Kazem Ghaffari vostakolaie, Reza Ghaffari
Mazandaran electric power distribution company, Iran

10134 *An Automated System for Overhead Line Inspection with Traveling Wave Measurement and Unmanned Aerial Vehicles*
Frederik Puhe, Maximilian Schmalen, Björn Keune, Carsten Hermanns, Mitja Wittersheim, Johannes Bleser
1: Westnetz GmbH, Germany; 2: Beagle Systems GmbH, Germany; 3: Siemens AG, Germany

10135 *Digitizing Grid And Vegetation Inspection With Remote Sensing And Artificial Intelligence*
Sophie Crommelinck, Katharina Gill, Jürgen Scholz, Mario Gnädig, Bartholomäus Surmann
Netze BW GmbH, Germany

10148 *On-line Medium Voltage Panel & Transformer Maintenance*
Anggoro Primadianto, Cyrillus Ekana, Yosephus Devalesy, Wahyu Prabowo
PLN Indonesia

10168 *Reallocation of Step Voltage Regulators in Distribution Networks to Overcome the Effects of Load Growth*
Ali Radwan
Middle Egypt Electricity Distribution Company, Egypt

10177 *Islanding Detection with Universal Grid-forming Inverter-based Generation*
Hannu Laaksonen
University of Vaasa, Finland

10188 *Low Voltage Grid "Flex-efficiency": Automatized Low Voltage Switchgear*
Tania Vázquez
e-redes (edp networks Spain), Spain

10216 *Reactive Power Forecasting At The Transmission-Distribution Interfaces Using Physics Based Machine Learning*
Arnaud Rosseel, Bashir Bakshideh Zad, Zacharie De Grève, François Vallée
University of Mons, Belgium

10265 *Power Flow Analysis of Multi-Terminal Medium Voltage Bipolar DC Distribution Networks*
Jin-Oh Lee, Jin-Hong Jeon
Korea Electrotechnology Research Institute, South Korea

10273 *Electrical Energy Flexibilities' Prediction and Validation of a Real Non-Residential Building Through Methods of Machine Learning*
Maximilian Hendrik Forchheim, Tuğçin Kırant-Mitić, David Cano-Tirado, Markus Zdrallek
University of Wuppertal, Germany

10274 *Smart Metering And Grid Data Services : French Experience And International Perspectives*
Victoria Tan, Laurent Karsenti, Sébastien Brun
1: Enedis, France; 2: Enedis, France; 3: Enedis, France

10290 *Benefits for the Distribution Network from the Installation of Synchronized Edge Devices*
Alessandro Mingotti, Lorenzo Peretto, Alessandro Cirocco, Samuele Forciniti, Andrea Pegoiani, Andrea Ruffini
1: University of Bologna, Italy; 2: Unareti S.p.A

10307 *On Dynamic Behaviour of Active Distribution Grids during Flexibility Provision*
Florian Klein-Helmkamp, Philipp Linnartz, Kardeniz Elbil, Andreas Ulbig
IAEW at RWTH Aachen University, Germany

10320 *Holistic Emergency and Crisis Management of an Austrian DSO*
Hans-Jürgen Wernegger, Robert Schmaranz, Martin Ruhhütl
KNG-Kärnten Netz GmbH, Austria

10330 *V2X Integration in Self-Consumption Energy Management System*
Samuel Matias, Joao Mateus, Manuel Pereira, Tarcísio Silva, António Furtado, Charalampos Ziras, Mattia Marinelli, Luiz Dias, Rafael Rodrigues, Hugo Morais
1: EDP NEW R&D, Portugal; 2: INESC-ID/IST, Portugal; 3: EDA, Portugal; 4: DTU, Denmark

10333 *Suppling Of Portion Of MV Network During Blackout Periods Involving Generators Of Grid Users*
Luigi D'Orazio, Fabio Zanellini, Ettore De Berardinis, Niccolò Corsi
1: ENEL, Italy; 2: Renantis, Italy; 3: CESI, Italy; 4: e-distribuzione, Italy

10338 *Using Local Renewable Energy To Energize a Portion of a LV Grid in Islanded Mode*
Jane Marchand, Jérôme Buire, Vincent Debusschere, Nabil El-Jarrai, Jean Pompee, Marie-Cécile Alvarez-Herault, Nouredine Hadjsaid
1: Univ. Grenoble Alpes, CNRS, Grenoble INP*, G2Elab, F-38000 Grenoble, France; 2: Enedis, France

10343 *An Innovative Toolbox for the Optimal Design and Operation of Integrated Local Energy Communities*
Marialaura Di Somma, Christina Papadimitriou, Andrei Morch, Hanne Sæle, Peter Richardson, Alessio Coccia, Amedeo Buonanno
1: ENEA; 2: Eindhoven University of Technology; 3: SINTEF Energy Research; 4: EPRI Europe

10349 *Load And Generation Forecast On Substation Level*
Martin Ruhhütl, Robert Schmaranz, Thomas Dietrichsteiner
KNG-Kärnten Netz GmbH, Austria

10353 *Determination of the Topology of Low-Voltage Distribution Grids using Cluster Methods*
Franziska Maria Tischbein, Kilian Kean, Chris Martin Vertgewall, Andreas Ulbig, Lena Altherr
1: IAEW at RWTH Aachen University, Germany; 2: FH Aachen University of Applied Sciences

10358 *Integration Of Battery Aging Model In Ancillary Services And Self-consumption Combined Strategies.*
Laurine Ferrando, Raphael Caire, David Frey, Jean-Marc Guenee
1: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, Grenoble, France; 2: Wattmen, Saint-Priest-En-Jarez, France

10359 *Detection of Weather Induced Events on Overhead Power Lines*
Daniel Mitcan, Bertrand Godard
Ampacimon SA, Belgium

10366 *Phase Identification of Single-phase Users in a Distribution Network*
Sreten Davidov, Jurij Curk
Elektro Ljubljana d.d., Slovenia

10372 *Digital Twins Handling : The Real Deployment Stakes!*
Laurent Guise, Gilles Nativel, Guillaume Denis, Djibril Diop, Eric Suignard, Philippe Tailhades, Benoît Jeanson, Thierry Coste
1: EnergySemantic.com, France; 2: ENEDIS, France; 3: RTE, France; 4: GIMELEC, France; 5: EDF, France; 6: Schneider-Electric, France

10375 *The Next Generation of ADMS Functions for Predictive Management of DER*
Paulo Viegas, José Simões, Pedro Silva, Dora Cabral, Miguel Gomes, Luis Gonçalves, Carlos Costa, Ricardo Bessa, Jorge Pereira, Pedro Benedicto, Micael Simões, Ricardo Andrade, João Viana, Maria Araújo, Manuel Azevedo
1: EFACEC, Portugal; 2: ARMIS, Portugal; 3: INESC TEC, Portugal; 4: Faculty of Economics - University of Porto, Portugal; 5: PH Energia, Portugal

10377 *E-REDES's New Method To Identify Non-optimal LV (Low Voltage) Grid Reconfiguration After Outages and Planned Maintenance Actions*
Rita Lopes Mourão, Gonçalo Santos, David Fonseca, Miguel Louro, José Sousa
E-REDES, Portugal

10387 *Evaluation of Quota-based Predictive Congestion Management in Active Distribution Networks*
Sharon Müller, Krzysztof Rudion, Marc-Aurel Frankenbach, Carmen Exner
1: University of Stuttgart, Stuttgart, Germany; 2: Netze BW GmbH, Stuttgart, Germany

10389 *Evaluation of Transit Power Flows in High Voltage Distribution Grids using Fuzzy Logic*
Paul Burkhardt, Krzysztof Rudion, Andreas Frank, Alexander Probst
1: University of Stuttgart, Germany; 2: Netze BW GmbH, Germany

10390 *The Use Of Digital Data For A New Innovative Quality Level Of Asset Management For Transformer*
Karsten Viereck, Anatoli Saveliev
Maschinenfabrik Reinhausen GmbH, Germany

10394 *Optimizing DER Reactive Power Setpoint For DSO Operational Planning For MV Grid*
Amel Addala, Benoit Bouzigon, Andréa Laugère, Riadh Zorgati
1: EDF Lab Paris Saclay; 2: Enedis

10405 *Real-time Circulating Currents Calculation In The Distribution Management System*
Jan Van de Vyver, Cedric Lahousse, Tine Vandoorn
Fluvius System Operator CV, Belgium

10415 *Analysis and Insights from Reactive Power Measurements of Low Voltage Users*
Marta Vanin, Hakan Ergun, Reinhilde D'hulst, Koen Vanthournout, Dirk Van Hertem
1: KU Leuven, ESAT - Electa, Kasteelpark Arenberg 10, 3001 Heverlee, Belgium; 2: EnergyVille, Thor Park 8310, 3600 Genk, Belgium; 3: VITO NV, Boeretang 200, 2400 Mol, Belgium

10427 *A Virtual Energy Storage System to Compensate for the Uncertainty in Distributed Renewable Generation*
Saif Sami, Yue Zhou, Meysam Qadrdan, Evgeny Prokofyev, David Pampliega, Jianzhong Wu
1: Cardiff University, United Kingdom; 2: Schneider Electric, Spain

10448 *Thermal Monitoring of Medium Voltage Switchgears: Testing in Operation Environment*
Vadim Migunov, Ralf Gitzel, Holger Kaul, Aydin Boyaci, Maurizio Zajadatz, Michael Suriyah, Thomas Leibfried, Nico Seidel
1: ABB, Germany; 2: Karlsruher Institut für Technologie (KIT), Germany; 3: SUEC Coburg, Germany

10456 *A Digital Twin for MV Switchgear Condition Monitoring Data*
Ralf Gitzel, Vadim Migunov, Tanja Tornede
1: ABB, Germany; 2: Universität Paderborn, SICP

10458 *LV Grid state estimation using local flexible assets: A Federated Learning approach*
Selma Čaušević, Shreshtha Sharma, Syrine Ben Aziza, Aliene van der Veen, Elena Lazovik
Netherlands Organisation for Applied Scientific Research (TNO), The Netherlands

10460 *A Novel Evaluation Method of Virtual Power Plant Effect on Distribution Networks Using Fuzzy Logic*
Jihui Hwang, Jin-Oh Lee, Gyeong-Hun Kim, Jin-Hong Jeon
Korea Electrotechnology Research Institute, South Korea

10461 *Assessment of the impact of Hybrid Distributed Generation / Batteries Energy Storage Systems on DSO Operational Planning*
Jamilson Junior, Ludovic Girault, Matthieu Alchourroun, Hugo Morais, Benoit Bouzigon
1: INESC-ID/IST, Portugal; 2: EDF R&D; 3: ENEDIS

10471 *Scalable Uncertainty Aware Ancillary Services Procurement Tool For Active Distribution Systems*
Muhammad Usman, Baara Mohandes, Florin Capitanescu, Andre Guimaraes Madureira, Martin Bolfek, Zdravko Matišić, Filipe Joel Soares, Nuno Fonseca, Henrique Teixeira, Carlos Mateo
1: Luxembourg Institute of Science and Technology, Luxembourg; 2: Hrvatska Elektroprivreda Operator Distribucijskog Sustava, Croatia; 3: Institute for Systems and Computer Engineering, Technology and Science, Portugal; 4: Institute for Research in Technol

10479 *Decentralized Smart Charging of Large-Scale EVs using Adaptive Multi-Agent Multi-Armed Bandits*
Sharyal Zafar, Raphaël Féraud, Anne Blavette, Guy Camilleri, Hamid Ben Ahmed
1: SATIE Lab, ENS Rennes, France; 2: Orange Labs, France; 3: SATIE Lab, ENS Rennes & CNRS, France; 4: IRIT Lab, UPS Toulouse, France

10489 *Grid Serving Charging Control of Electric Vehicles*
Timo Hertlein, Joerg Ochs, Christian Weindl, Tobias Blenk
1: Siemens AG, Germany; 2: Coburg University of Applied Sciences and Arts

10490 *Energy Charging of a fleet of electric vehicles based on Reinforcement Learning*
Hortensia Amaris, Mónica Alonso, María Angeles Moreno, Lucia Gauchia, Arturo de la Escalera, David Martin
University Carlos III Madrid, Spain

10492 *Placement of Virtual Inertia in Islanded Distribution Networks With High Penetration of Inverter-based Resources*
Fadi Kelada, Jérôme Buire, Nouredine Hadjsaid
1: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2ELab, 38000 Grenoble, France; 2: Nanyang Technological University, Singapore 639798, Singapore

10511 *Balancing PV Generation In Low Voltage Grids With Limited Data*
Christoph Jätz, Benjamin Petters, Navreet Dult, Amir Ahmadifar, Antonello Monti
1: Avacon Netz GmbH; 2: RWTH Aachen

10515 *Implications of Forecast Uncertainty on the Optimal Operation of Renewable Energy Communities*
Robin Sudhoff, Sebastian Schreck, Sebastian Thiem, Stefan Niessen
1: Siemens AG, Technology, Germany; 2: TU Darmstadt, Technology and Economics of Multimodal Energy Systems, Germany

10529 *Pilot Application of a Rule-Based TSO-DSO Coordination Concept in Switzerland*
Vanessa Schröder, Evangelos Vrettos, Martina Bossio, Michael Auer, Raphael Wu, Christophe Fritsch, Rafaela Tsaousi, Raffael La Fauci
1: Elektrizitätswerk der Stadt Zürich, Switzerland; 2: Swissgrid AG, Switzerland; 3: Zürcher Hochschule für angewandte Wissenschaften (IEFE), Switzerland

10532 *Short-Circuit Currents Information Exchange Between DSO and TSO, an Approach From the Portuguese Demonstration of the OneNet Project*
Madalena Lacerda, Gonçalo Glória, Mateo Cardenas, Rui Pestana, Aleksandr Egorov, Carlos Damas Silva, Alexandre Lucas, Miguel Louro
1: E-REDES, Portugal; 2: R&D Nester, Portugal; 3: REN, Portugal; 4: INESC TEC, Portugal

10534 *Towards a Control System Simulator Based on a Digital Twin for Cyber-Physical Power Systems*
Dennis van der Velde, Armin Fatemi, Immanuel Hacker, Raphael Bäumer, Michael Andres, Andreas Ulbig
1: Fraunhofer FIT, Germany; 2: IAEW at RWTH Aachen, Germany; 3: RWTH Aachen, Germany

10573 *Fitness-check for Power Plants in Distribution Networks for Black Start and Regional Islands*
Darko Brankovic, Robert Schürhuber, Andreas Abart, Norbert Rechberger
1: Graz University of Technology, Austria; 2: Netz Oberösterreich; 3: Energie AG Erzeugung GmbH

10585 *Calculating Probability of Critical System States by Using Bayesian Distribution System State Estimation*
Eva Buchta, Mathias Duckheim, Michael Metzger, Paul Stursberg, Stefan Niessen
1: Siemens AG, Germany; 2: TU Darmstadt, Germany

10598 *Investigation of Grid-Serving Flexibility Provision by Electric Vehicles in a Distribution Grid*
Kevin Kratz, Sharon Müller, Krzysztof Rudion, Christian Körner
1: University of Stuttgart, Germany; 2: Stuttgart Netze GmbH, Germany

10599 *Feeder Remote Terminal Unit of Distribution Automation System for Detecting Impact and Tilt Change applied to Distribution Equipment*
GyuHo Han, Haeyung Jeong, Yeonho Lee, Seongwon Cho
KEPCO KDN, South Korea

10624 *Modelling of a Heat Network Infrastructure to Investigate the Stability of a Gas-independent, Sectoral-coupled Multi-energy System*
Elisabeth Feldhoff, Tom Duphorn, Steffen Schlegel, Dirk Westermann
Ilmenau University of Technology, Germany

10637 *Accuracy Analysis of a Sensitivity-Based Distribution System Model for the Centralized Redispatch of Distributed Flexibilities*
Daniel-Leon Schultis
AIT Austrian Institute of Technology GmbH, Austria

10667 *Field Validation of Distribution System State Estimation Based on a Limited Number of Measurement Devices*
Riccardo Vasapollo, Lorenzo Zanni, Paolo Romano, Daniel Gross, Elaheh Mashayekhi
1: Zaphiro Technologies, Switzerland; 2: Netze BW GmbH

10668 *Robust Determination of Reactive Power Potentials from Subordinate Networks in Close-to-Real-Time Operation*
Tom Sennewald, Patryck Tysler, Nadja Isabelle Hiersemann, Dirk Westermann
TU Ilmenau, Germany

10672 *An Experience Of Detection And Classification Of Quality-Of-Service Problems In MV/LV Distribution Substations Using Artificial Intelligence: Senegal Case Study*
Mouhamad Al Mansour Kébé, Maodo Sene, Nafissatou Diagne
Senelec, Senegal

10676 *Digital Twin Based on CIM CGMES for Smart Grid and Data Based Use Cases*
Jonas Wäfler, Lukas Baumgartner, Raffael La Fauci
ewz, Switzerland

10731 *Model Predictive Control for Smart Grid Charging of Autonomous Electric Vehicle Fleet using Local Renewable Energy Generation*
Haider Ali, Bruno Francois, Luce Brotcorne, Zahra Foroozandeh, João Soares
1: L2EP - Ecole Centrale de Lille, France; 2: INRIA Lille, INOCS; 3: GECAD - Instituto Superior de Engenharia do Porto, ISEP

10732 *Techno-economic Estimation of Reactive Power Related Additional Losses in Wind Farms During Reactive Power Supply*
Felix Korff, Hartmudt Köppe, Bernd Engel
1: E5, Technical University of Darmstadt, Germany; 2: elenia, Technical University of Braunschweig, Germany

10734 *Simulating the Voltage Stability in a Power System Network using OpenModelica and Comparing the Results with PowerFactory*
Nimmi Regmi, Dietmar Winkler, Shailendra Kumar Jha
1: Kathmandu University; 2: University of South-Eastern Norway

10741 *Validating Real LV Feeder Models Using Smart Meter Data: A Practical Experience From Project EDGE*
Michael Z. Liu, Angela Simonovska, Luis F. Ochoa, Peter K.C. Wong, Kenneth Chew, John Theunissen
1: The University of Melbourne, Australia; 2: AusNet Services, Australia

10749 *Improved Load and Generation Forecasting for Extended Day-Ahead Estimates in the Nordic Grid*
Swaechchha Dahal, Gunne John Hegglid, Thomas Øyvang
1: University of South Eastern Norway, Norway; 2: Kathmandu University, Nepal

10754 *Detecting Power Outages In Low-Voltage Networks From Telecommunications Networks Data*
Marleen Bahe, Matthias Herlich, Peter Dorfinger, Josef Leist, Christian Wohlsein, Markus Radauer, Gerald Hörack, Walter Schaffer
1: Salzburg Research Forschungsgesellschaft mbH, Austria; 2: Salzburg AG, Austria; 3: Salzburg Netz GmbH, Austria

10761 *Geolocalized Photovoltaic Energy Prediction Methodology using Machine Learning*
Nicolas Chianella, Dominique Genoud, Jean-Marie Alder, Olivier Arbellay, Jérôme Treboux, Jérémie Vianin, David Wannier
1: Institute of Informatics, HES-SO Valais Wallis, Switzerland; 2: Institute of Sustainable Energy, HES-SO Valais Wallis, Switzerland

10771 *Optimal Management of Flexibility Services at LV Distribution Grid Level*
Riccardo Nebuloni, Valentin Ilea, Cristian Bovo, Alberto Berizzi, Carlo Arrigoni, Roberto Bonera, Brunella Conte, Franco Conti
1: Politecnico di Milano, Italy; 2: Università degli Studi di Pavia, Italy; 3: Siemens, Italy; 4: Freelancer

10772 *How Disruptive Artificial Intelligence Solutions Can Enhance Safety Of Field Operations In The Electrical Sector*
Fabrizio Chiovoloni, Nerea Gonzalez Gomez, Andrea Iaccarino, Stefano D'Angelo, Carlos Gaitan Poyatos, Janira Petruzzi, Gianmarco Lucreziano
1: Enel Grids, Italy; 2: ENEL IBERIA, S.R.L.U.; 3: Enel Global Services S.r.l.; 4: ENDESA MEDIOS Y SISTEMAS, S.L.U.

10779 *Automated Emergency Power Supply For Drinking Water Supply By A Hydro Power Plant In Islanded Grid Operation*
Johanna Timmermann, Claudia Bernecker-Castro, Tobias Lechner, Sebastian Seifried, Dirk Menker, Christian Dellmann, Günther Störzer, Michael Finkel, Rolf Witzmann
1: Technical University of Munich, Germany; 2: Augsburg University of Applied Sciences, Germany; 3: KIMA Automatisierung Gesellschaft für elektronische Steuerungstechnik und Konstruktion mbH, Germany; 4: LEW Wasserkraft GmbH, Kraftwerkstechnik, Germany; 5

10797 *Wireless Self-powered Monitoring System for Underground Cable Jonts: a Real Use-case*
Antonio-Miguel Munoz-Gomez, Jesus Muñoz-Cruzado-Alba, Javier Granado-Fornas, José F. Sanz-Osorio
1: Circe, Spain; 2: University of Zaragoza, Spain

10818 *Flexibility Coordination Mechanism Between A Distribution System Operator And A Virtual Power Plant Involving Wind Parks And A Battery Energy Storage System*
Nuran Cihangir Martin, Floris van Lith, Niels Poiesz, Paul Bierling, Peter Vinke, Anne van der Molen
Stedin, The Netherlands

10853 *Single Point Lidar Technology For Ground Clearance Measurement In Medium Voltage Overhead Lines With The Deployment Of Unmanned Aerial System (UAS) In TNB Distribution Network Division*
Muhammad Fazli Nozlan, Mohd Faris Ariffin
Tenaga Nasiona Berhad (TNB), Malaysia

10878 *Using Light Electric Vehicles For V2G services in the Arctic*
Shayan Dadman, Bernt Bremdal
1: UiT Campus Narvik; 2: Smart Innovation Norway

10883 *Coupling Optimal Energy Management and Allocation through Keys of Repartition in Energy Communities*
Alyssa Diva Mustika, Rémy Rigo-Mariani, Vincent Debusschere, Amaury Pachurka
1: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, France; 2: Sween, France

10884 *The New Condition-Based Maintenance of MV Cable Lines Supported by Diagnostic Data*
Slawomir Noske, Sebastian Grzelka, Krzysztof Kołodziejczyk
1: ENERGA-OPERATOR SA, Poland; 2: Globema Sp. z o.o.

10895 *EV Charging Microgrid: Electrical and Operation Modeling of Energy Management*
Joelson Lopes da Paixão, Alzenira da Rosa Abaide, Jordan Passinato Sausen, Leonardo Nogueira Fontoura da Silva, Nelson Knak Neto
UFSM, Brazil

10900 *The Lac-Mégantic Microgrid: A Shared Vision of Energy Transition and the new role for Microgrid Control*
Kevin Morrissey, Mark Jaggassar, David-Olivier Goulet, Robert MacDonald, Mark Collins
1: Smarter Grid Solutions; 2: Hydro-Québec

10920 *DR Business Model Suggestion Applying IoT Solutions with Mesh Network Technology Based on IEEE 802.15.4*
Si hyeong Jang, Jun ho Lee, Jung won Kim, Jae myeon Hong
1: KEPCO ES, South Korea; 2: KEPCO ES, South Korea; 3: KEPCO ES, South Korea; 4: Merlot Laboratories Inc., South Korea

10945 *Increased Electrical Transmission And Resilience Of Distribution Systems By The Use Of Optical Fibre Systems*
Thomas Gräf
Hochschule für Technik und Wirtschaft Berlin, Germany

10968 *Techno-economic Comparison Of Reactive Power Control Modes For Distributed Generators For Voltage Regulation In LV Grids*
Cyril Gisbert, Josselin Fournel, Géraud Rias, Mathieu Gondolo
1: EDF R&D, France; 2: Enedis, France

10983 *Data Analytics For Pruning Optimization Around Power Lines*
Charles Demay, Pierre Achaichia, Philippe Tuloup
ENEDIS, France

10986 *Advanced Concept of Efficient Use of Transformers Leveraging the Dynamic Thermal Rating Technology*
Andrej Souvent, Miha Rot, Tim Gradnik, Andrej Spec, Polona Koprivc, Nejc Petrovič, Gregor Omahen, Gregor Kosec
1: Operato d.o.o., Slovenia; 2: SODO d.o.o., Slovenia; 3: Elektro Gorenjska, d.d., Slovenia; 4: ELES, d.o.o., Slovenia; 5: EIMV, Slovenia; 6: Jožef Stefan Institute, Slovenia

10987 *Data Driven Analytical Model Optimizing Grid Capacity Utilization*
Stig Simonsen, Thomas Øyvang, Ole Kristian Grindbakken
1: Lede AS, Norway; 2: USN, Norway

10992 *Operational Strategies for Maximising the Value of Customer Flexibility*
Danny Pudjianto, Goran Strbac
Imperial College London, United Kingdom

10997 *Development of Support System for Restoration of Power Outage in Distribution Facilities*
Taku Kimura, Shunsuke Takeuchi, Keiichi Fujimoto, Kyozo Furuta, Keisuke Morita, Yuki Kawachi, Noriaki Kano
KANSAI Transmission and Distribution, Inc., Japan

11003 *Distribution Network Reconfiguration Strategy with Soft Open Point using GA and PSO*
Hyun-Woo Kim, Seon-Ju Ahn, Sang-Yun Yun, Joon-Ho Choi
Chonnam National University, South Korea

11017 *Demonstrating Interactions of Distribution Network and Local Energy Communities Operating in Hierarchically Autonomous Control Architecture Paradigm*
Merkebu Zenebe Degefa, Rubi Rana, Henning Taxt
SINTEF Energy Research, Norway

11035 *Distribution Smart Transformer Pilot Experience for LV Grid Real Time Operation*
Luis Del Río Etayo, Patrick Mulroy, Iker Garcia Ribote, Itziar Lumbreras, Luis Layo
1: Ormazabal; 2: i-DE

11046 *An Impact of Electrical Distribution Networks on the Operation of AC 25 kV Railway System*
Vsevolod Pavlovsky, Anton Steliuk, Andriy Zakharov, Vasyl Makogonchuk
1: DMCC Europe, France; 2: DMCC Engineering, Ukraine; 3: DMCC Europe, France; 4: DMCC Engineering, Ukraine

11049 *DeepGrid: Bringing the Operational Awareness to the LV Grid*
Rui Couto, Joana Faria, José Oliveira, Gil Sampaio, Ricardo Bessa, Francisco Rodrigues, Ricardo Santos
1: ENEIDA.IO, Portugal; 2: INESC TEC, Portugal; 3: E-Redes, Portugal

11060 *The Implementation of Linear Asset Management As A Framework Solution In Distribution Electricity Network in Indonesia*
Very Fernando, Kharisma Utomo Mulyodinoto, Indratno Pardiasnyah, Revi Aldrian, Yopi Ardian Noval, Nanda Tommy Wirawan
1: PT PLN (Persero), Indonesia; 2: University Of Putra Indonesia, Indonesia

11065 *A Platform For Real-time Monitoring And Detection Of Conductor Integrity Related Health Hazards In Distribution Networks*
Guilherme Freire, João Campos, Joana Faria, Philip Marsh
1: ENEIDA.IO, Portugal; 2: Powerco, New Zealand

11071 *Congestion Anticipation and Preemptive Resolution in Distribution Networks Using Grid Internal and Redispatch Measures*
Susanne Schmitt, Iiro Harjunkoski, Giancarlo Dalle-Ave, Milos Subasic, Peter Noglik
1: Hitachi Energy, Germany; 2: Hitachi Energy, Canada

11073 *Assessing the Pros and Cons of Different Operating Envelope Implementations Across Australia*
Arthur Gonçalves Givisiez, Luis F. Ochoa, Michael Z. Liu, Vincenzo Bassi
The University of Melbourne, Australia

11089 *Dynamic Operation of MV Grids Based on Losses Optimisation*
João Nunes Carreira, João Pedro Baptista, Diogo Carrilho, Alexandre Monteiro, Ines Roca
E-REDES, Portugal

11093 *High-level Resilience Strategizing Using Data-Driven Inputs*
Xavier Weiss, Lars Nordström, Arne Berlin
1: KTH Royal Institute of Technology, Sweden; 2: Vattenfall Eldistribution AB

11103 *Essential Aspects of Operational Risk Assessment and its Application: Issues and Challenges*
Zunaira Nazir
Luleå Tekniska Universitet, Sweden

11105 *Management of the Distribution System Operation During the Crisis – Earthquakes in Republic of Croatia in 2020.*
Marina Cavlovic, Damir Piric, Ivan Perisa
1: SAG 3, Croatia; 2: HEP ODS Ltd, Croatia

11109 *Optimal Cross-Voltage Operation of Active Distribution Networks Considering Flexibility and Production Schedule of an Industrial Customer with Various Business Models*
Nasratullah Mohseni, Sergio Contreras, Johanna Myrzik
University of Bremen, Germany

11118 *IoT enabled System for High Voltage Disconnector Advanced Asset Management*
Mikel Beltrán Hernández, Iban Landeta Zarate, Juan Carlos Pérez Quesada, José Enrique Alonso Alfayate
1: Schneider Electric (MESA plant), Spain; 2: Red Eléctrica, Spain

11127 *Performance Analysis of a State Estimator for Low Voltage Unbalanced Grids Using Different Advance Metering Infrastructure Technologies*
Mahmoud Rashad Ahmed, José Manuel Cano, Bassam Mohamed, Pablo Arboleya
1: University of Oviedo, Spain; 2: Plexigrid, Spain

11147 *Impact of Charging Stations on Voltage Quality - Island and Grid Operation of Real Installation*
Petr Mastny, Jan Moravek, Martin Vojtek, Michal Vrana, Matej Vrtal
Brno University of Technology, Czech Republic

11148 *Demonstration for New Type SVR Using Commercial Distribution System with DERs*
Naoyuki Takahashi, Yuya Tachibana, Satoshi Uemura
Central Research Institute of Electric Power Industry, Japan

11176 *Partial Discharge Diagnostics on Medium-Voltage Switchgears - Measurement Methods and Benefits*
Maurizio Zajadatz, Christophe Lemmer, Aaron Fischer, Michael Suriyah, Thomas Leibfried
Karlsruhe Institute of Technology (KIT), Germany

11177 *Optimal Scheduling of EVs Route Considering Integrated Power and Transportation System*
Myeongseok Chae, Hee june Cha, Dongjun Won, Taesic Kim
1: Inha University, South Korea; 2: Incheon International Airport Corporation; 3: Department of Electrical Engineering and Computer Science Texas A&M University-Kingsville, Kingsville, TX 78363, USA

11179 *Performance Evaluation and Operational Logistics in Energy Distribution Utility Fleet Electrification*
Lucca Zamboni, Bruno Martin de Alcântara Dias, Cynthia Thamires da Silva, José Sidnei Colombo Martini, Andre Polatschek Rodrigues, Nathalia Rubo Nobre de Freitas
1: GESEL - Grupo de Estudos do Setor Elétrico - Brazil; 2: USP - Universidade São Paulo - Brazil; 3: CPFL Energia

11184 *E-REDES Adopt New Monometallic Technology and Predictive Algorithm to Minimize and Predict LV Neutral Loss Failures Detection*
Carolina Marques, Cláudia Gaspar, Carlos Vieira Santos, Jorge Mendes Santos, Susana Margarido Morgado, João Nunes Carreira, Ricardo Princípe Santos, Alcides Gomes, Jorge Alves Dias, Frederico Lourenço, Jad Azar, Patrícia Duarte, Luís Fonseca, Miguel Verís
E-REDES, Portugal

11190 *Challenges in Proactive Congestion Management in Distribution Grids - Practical Findings from the flexQgrid Project*
Marc-Aurel Frankenbach, Carolin Schubert, Carmen Exner, Sheau-Yu Lin, Ariane Höck
1: Netze BW GmbH, Germany; 2: EnBW AG, Germany; 3: FZI Research Center for Information Technology, Germany

11224 *Vision For Smart Grid Interoperability: Standards Based Integration Of E-Mobility, Prosumer, And Grid*
Mayank Sharma, Tom Berry
Schneider Electric, France

11232 *Determination of Q(P)- And Q(U)-Characteristics By Means Of Time-Series Based Optimal Power Flow Calculations To Optimize Distribution Grid Operation*
Manuel Schwenke, Jutta Hanson, Rafael Steppan, Anna Pfendler
Technical University Darmstadt, Germany

11260 *Modeling Active Grid Operation In A Testbed For Cyber-Physical Systems*
Armin Fatemi, Florian Schmidtke, Thomas Offergeld, Lukas Winkler, Gökhan Akbaba, Andreas Ulbig
1: IAEW at RWTH Aachen University, Germany; 2: Fraunhofer FIT, Germany

11261 *Use of Voltage Regulation on HV/MV Substations to Increase Hosting Capacity in the LV Grid*
Johannes Jargstorf, Ward Boeraeve, Piet Lauwers
Fluvius System Operator CV, Belgium

11268 *Simulating Integration Of New Flexibilities And DER In A Low-Voltage Grid*
Arthur Forestier, Chloé Lucas, Philippe Deschamps, Christophe Dufour
1: Odit-e, France; 2: SICAE de la Somme et du Cambraisis, France

11292 *C-HIL Environment for Parameter Optimization of Grid Friendly Charging Control*
Alfred Einfalt, Albin Frischenschlager, Lukas Schroeer, Andreas Schildorfer, Anton Steinwendtner
Siemens AG OEsterreich, Austria

11327 *Extended Reality in Power Distribution Grid: Applications and Future Trends*
Komeil Nosrati, Saleh Ragheb Saleh Alsaleh, Abiodun Emmanuel Onile, Vjatšeslav Škiparev, Juri Belikov, Aleksei Tepljakov, Eduard Petlenkov
1: Department of Computer Systems, Tallinn University of Technology, Estonia; 2: Department of Software Science, Tallinn University of Technology, Estonia

11336 *Demand Response Using Remote Modification Of Smart-Meters' Subscribed Power To Protect Low-Voltage Feeders In Ouagadougou, Burkina Faso*
Benoît Grosjean, Antoine Lassauce, Luc Richaud, Camille Bayanma, Yann Mouchel, Sébastien Siarras, Khalil Mouad
1: Odit-e, France; 2: SONABEL, Burkina Faso; 3: Smartside, France; 4: GridPocket, France; 5: Institut Smart Grid, France

11339 *Rethink Grid Management – Challenges, Use Cases And Design Principles For The Next Generation Of Grid Operation Systems*
Ben Gemsjaeger, Robert Wenz, Dr. Michael Ebert, Sigurd Kvistad, Jens Tore Holene, Jørgen Sivertsen Åsrud, Sergio Manno, Emmanuele Maria Petruzziello, Nikolai Demydov
1: Siemens AG, Germany; 2: Elvia AS, Norway; 3: IRETI S.p.A., Italy

11342 *Investigation of Stacked Applications for Battery Energy Storage Systems*
Florian Schmidtke, Immanuel Hacker, Armin Fatemi, Andreas Ulbig
1: IAEW at RWTH Aachen University, Germany; 2: Fraunhofer FIT, Germany

11344 *Enhanced Virtual Power Plant Design And Implementation Lessons*
Gary Howorth, Ivana Kockar, Paul Tuohy, Graeme Flett, John Bingham
1: University of Strathclyde, United Kingdom; 2: Engineering Technology Centre Ltd (ETC), United Kingdom

11348 *An Integrated Approach for Energy Management Optimizations in Customer Premises*
Mana Azamat, Johann Schütz
OFFIS, Germany

11351 *An Economical Operation Strategy of Multi-Energy Virtual Power Plant in a Distribution Network*
Jin-Wook Lee, Kyu-Sang Cho, Sung-Yong Son
1: Gachon University, South Korea; 2: ATE Solutions, South Korea

11357 *How To Control The Vegetation In Overhead Lines? – Analytics4Vegetation*
Ricardo Borges, Maria Nela Meneses, Artur Jorge Figueiredo, Fátima Santos, Inês Lopes, Miguel Correia
1: E-REDES, Portugal; 2: EY-Ernst & Young

11359 *Frequency Response Of A Microgrid Under The Influence Of Enhanced Spatial And Orientational Smoothing Of Photovoltaic Output*
Nida Riaz, Lasse Peltonen, Antti Hildén, Sami Repo, Pertti Järventausta
Tampere University, Finland

11371 *Platform for Traceability and Inspection Management Through the Use of Artificial Intelligence Techniques*
Felipe Wellington Barboza, Jéssica Tiemi Takeuchi, Fabio Carrasco Baptista, João Pedro Klock Ferreira, Miguel Britto Bessa, Vitor de Souza Rodrigues
1: CPFL Energia S.A.; 2: Concert Technologies S.A.

11398 *Linear State Estimation in Distribution System Using Smart Meter Data*
Izar Lopez-Ramirez, Lakshan P. Piyasinghe, Inmaculada Zamora, J. Emilio Rodriguez-Seco
1: TECNALIA, Basque Research and Technology Alliance (BRTA)., Spain; 2: Department of Electrical Engineering Engineering, University of the Basque Country (UPV/EHU), Spain; 3: Hubbell, Inc., USA

11408 *Black Start In Distribution Grids Through Solid-State Transformer*
Mário Couto, Alessio Coccia
Electric Power Research Institute, Ireland

11409 *"Energy Package" as a Tool to Reduce Environmental Footprint and Withhold Grid Capacity Limit at Harbour Areas*
Iliana Ilieva, Emil Wingstedt, Anja Wingstedt, Tore Lundestad, Pål Erling Johnsen, Ole Jakob Sørdalen
1: Smart Innovation Norway, Norway; 2: BORG HAVN IKS; 3: Pixii

11423 *Challenge of Integration BESS on Distribution Active Network Management Scheme*
Gonzalo Tejero Calvo Calvo, Minjiang Chen, Jonathan Fox, Matthew Jones, Gerard Boyd, David Neilson
1: SP Energy Networks, United Kingdom; 2: Frazer Nash Consultancy

11429 *Near Real-Time Topology Estimation in LV Network with PLC Smart Meters*
Lucía Suarez-Ramon, Pablo Arboleya, Jose Manuel Carou Álvarez
1: University of Oviedo, Spain; 2: EDP Redes España

11442 *GridDrone: Use of Drones to Perform Thermographic, Distance Measurement and Visual Inspection of the HV and MV Aerial Network*
Francisco Rodrigues, Ricardo Santos, Ricardo Borges, André Coelho, Tom Välja, Madis Stern
1: E-Redes, Portugal; 2: EDP Labelec; 3: Hepta Airborne

11449 *Application of Graph Theory in Urban Infrastructure Analysis*
Matej Vrtal, Vit Krcal, Petr Toman
Brno University of Technology, Czech Republic

11451 *Operation of Electrical Vehicle Recharging Station with a Photovoltaic System to Reduce the Impact on the Distribution Network*
Samuel D. Vasconcelos, José F.C. Castro, Leonardo Limongi, Gustavo M.S. Azevedo, Davidson C. Marques, Pedro A. Rosas, Fabricio Bradaschia, Amanda L. Fernandes, Jun QI, Luciano Tavares, Antônio V. M. L. Filho, Nicolau K. L. Dantas
1: Federal University of Pernambuco - UFPE; 2: CPFL Energy; 3: Advanced Institute of Technology and Innovation ; 4: Institute of Technology Edson Mororó Moura - ITEMM

11454 *Electrical Safety Performance Assessment of MV/LV Distribution Substations*
Yaser Raeisi Gahrooei, Davide Pavanello, Jessye Amrani, Xavier Emery
1: HES-SO Valais, Switzerland; 2: OIKEN, Switzerland

11455 *A Methodology for the Evaluation of Congestion Induced Costs in Distribution Grid Operation*
Damianos Cheilas, Henrik W. Bindner, Tilman Weckesser
Technical University of Denmark

11459 *Assessment of Battery Energy Storage System Operating Modes in a Microgrid for EV Charging*
Maria Clara D. G. N. Martins, José F.C. Castro, Davidson C. Marques, Pedro Rosas, Guilherme Rissi, Amanda L. Fernandes, Xuan Luo, Luiz H. A. de Medeiros, Alexander B. Lima, Gustavo M.S. Azevedo, Marcio E. Brito, Geraldo L. Maia, Andrea S. M. Vasconcelos
1: Federal University of Pernambuco - UFPE; 2: CPFL Energy; 3: Institute of Technology Edson Mororó Moura - ITEMM

11460 *Optimized Deployment of Online Partial Discharge Monitoring Solutions for Branched MV Networks*
Moussa Kafal, Dimitri Charrier, Samuel Griot, Aymeric Andre
NEXANS, France

11463 *An Improved GA-based Approach for Reduced Non-discriminatory Renewable Energy Curtailment*
André Pedroso, Giuseppe Zanatta, Ângela Ferreira, Ana Pereira, Yahia Amoura, Rui Lopes, Eduardo Ângelos, Fillipe Vasconcelos, Manuel Lemos, Gabriel Pino
1: Research Centre in Digitalization and Intelligent Robotics (CeDRI), Instituto Politécnico de Bragança, Portugal; 2: Instituto Politécnico de Bragança, Portugal; 3: GML Transmission Line Solutions, S.A., Brazil

11503 *Electrifying East Nusa Tenggara with Smart Microgrid - Study Case on Semau Subsystem*
Daniel Tampubolon, Halomoan Siahaan, Albertus Hendriyanto
PT PLN INDONESIA, Indonesia

11520 *Transactive-based Control of Electric Vehicle Charging Stations Considering Network Congestion*

Sajjad Fattaheian Dehkordi
1: Aalto University, Finland; 2: Sharif University of Technology

Session 4 : Protection, Control & Automation

10104 *Generation of Synthetic Examples Using Generative Adversarial Networks (GAN) to Extend a Database of Fault Signals on Power Distribution Lines*
Javier Granado Fornás, Elías Herrero Jaraba, Andrés Llombart Estopiñan
1: Fundación Circe, Spain; 2: Universidad de Zaragoza

10115 *Data hub based secure integration of DER Assets with Utilities, DSO and Retail*
Nirmal Thaliyil, Nobin Mathew
Kalki Communication Technologies Pvt Ltd, India

10116 *Standard IEC 61850 based real-time DER interface for The Netherlands*
René Troost, Sjors van der Heijden, Rik Fonteijn, Alain Stuivenvolt, Davood Mohammadi Sooran, Bas Mulder, Joris van Leeuwen, Rob van Olst, Nuno Pereira, Elvira Sanchez Ortiz, Bart Pluijms
1: Stedin; 2: Enexis; 3: Alliander; 4: TenneT; 5: Holland Solar / NWEA / EnergieSamen; 6: ENCS

10126 *An Operational Data-Driven Malfunction Detection Framework for Enhanced Power Distribution System Monitoring – The DeMaDs Approach*
David Fellner, Thomas I. Strasser, Wolfgang Kastner, Behnam Feizifar, Ibrahim F. Abdulhadi
1: AIT Austrian Institute of Technology, Austria; 2: Technische Universität Wien (TU Wien); 3: University of Strathclyde

10128 *Analysis of Application of 5G Control and Protection in Distribution Networks and Test of Slicing Schemes*
Zou Xiaofeng, Cai Xinchen, Li Chunjie, Shen Bing
1: East China Electric Power Test and Research Institute, China; 2: State Grid Shanghai Municipal Electric Power Company, China

10156 *Voltage Regulations Solutions for Low Voltage Distribution Network with Large PVs Integration: Performance Analysis with A Real Swiss Case*
Baoling Guo, Ludovic Pignat, Julien Pouget, Nicolas Jordan, Didier Blatter, Guido Köppel
1: HES-SO, 1950, Sion, Valais, Switzerland; 2: OIKEN, 1950, Sion, Valais, Switzerland; 3: Enbag group, 3900, Brig, Valais, Switzerland

10166 *Analysis of Control Algorithms on Different Low-Voltage Grid Clusters*
Veronika Barta, Sonja Baumgartner, Armin Dulisch, Stephanie Uhrig, Rolf Witzmann
1: HM University of Applied Sciences Munich, Germany; 2: LEW Verteilnetz GmbH; 3: TUM Technical University of Munich

10178 *Detection and Location of Single Phase Faults in New 10(20) kV Distribution Networks*
Seila Gruhonjic Ferhatbegovic, Zijad Bajramovic
1: PE Elektroprivreda B&H, Bosnia and Herzegovina; 2: Faculty of Electrical Engineering, University of Sarajevo

10187 *Experience Sharing : Self Powered Relays - Simulated Over Current Phase & Earth Fault Testing*
Vijay Shah, Yogesh Bhamare, Arpita Leua, Harshit Surati
ABB India Ltd, India

10189 *Detection of Neutral Loss in Distribution Networks Using Smart Meters Records*
Tania Vázquez
e-redes (edp networks Spain), Spain

10191 *Machine Learning Based Grid Optimization Algorithm for Real-time Applications*
Andreas Winter, Michael Igel, Peter Schegner
1: Hochschule für Technik und Wirtschaft des Saarlandes, Germany; 2: Technische Universität Dresden, Germany

10204 *Innovative 5G Transmission For Anti-islanding Protection In MV Distributive Network*
Etienne Toutain, Patrick Coudray, Emmanuel Villalta, Pierre Renaldo, Philippe Dauchy, Nicolas Bihannic, Philippe Bertazzon
1: EDF, France; 2: ENEDIS, France; 3: Wavestone, France; 4: Nokia, France; 5: Orange, France

10210 *A Study on Automatic Fault Isolation of Closed Loop System in Power Distribution System*
Chung min Lee, Sang hyun Park, Hak Yeol Park, Soon gu Kang, Un jung Jeong
Distribution Business Department / KEPCO KDN, South Korea

10226 *Optimized Provision of Local Ancillary Services With Sensitivity Factors Using Prosumer Flexibility*
Carsten Wegkamp, Mattias Hadlak, Henrik Wagner, Julius Kohlhepp, Bernd Engel
elenia, Technische Universität Braunschweig, Germany

10238 *Evaluating State Estimation Performance On Distribution Circuits With High PV Penetration*
Jens Schoene, Muhammad Humayan
EnerNex, United States of America

10249 *Smart Meters for Grid State Identification with Use Case for Agent-based Local Energy and Flexibility Markets*
Markus Koch, Martin Asman, Markus Zdrallek, Ghayathri Suriyamoorthy, Kamil Korotkiewicz
1: University of Wuppertal, Germany; 2: PSI Grid Connect GmbH, Germany

10256 *An Implementation of IEC 61850 for Microgrid Control*
Yiming Wu, Firas Daraiseh, Elise Ramqvist, Annika Larsson, Ulrika Morild
Vattenfall AB, Sweden

10266 *Pilot Test of the Method Vdip for an Earth Fault Localization*
David Topolanek, Vaclav Vycital, Vit Krcal, Jan Grossmann, Michal Jurik
1: Brno University of Technology, Czech Republic; 2: ELVAC a.s.; 3: EG.D, a.s.

10276 *Success deployment of 6 digital substations in Vietnam 2020-21 – Return of experience*
Van Ngo Ha, Tuan Thanh Bui, Hung Hoang, Dang-Thoang Vo, Chin-Fei Chow, Chee Pinp Teoh
1: GE Renewal Energy, United Kingdom; 2: EGRID, Vietnam; 3: AIT Corporation, Vietnam; 4: GE Renewal Energy, Vietnam; 5: GE Renewal Energy, Singapore

10284 *Experimental Validation of a Novel Stator Interturn Fault Detection Method in Induction Motor*
Simi Valsan, Arinjai Gupta, Ranjeet Kumar
ABB, India

10291 *QUEST - An Overarching System Control Solution*
Mark Collins, Milena Jajcanin, Kieran Bailey, Colin MacKenzie, Stephen Stott, Elizabeth Macharia
1: Smarter Grid Solutions, United Kingdom; 2: Schneider Electric, Serbia; 3: Electricity North West Ltd., United Kingdom; 4: Fundamentals Ltd., United Kingdom

10296 *GEMS: Development Of Automated Generator Dispatch For The Purpose Of Maximising Built Asset Utilization*
Daniel Lafferty, Jennifer MacKenzie, Cristina Fundulea, Catherine Edwards, Bojana Djukic, Diyar Kadar
SP Energy Networks, United Kingdom

10299 *TLC Strategy For Power Distribution Grids*
Daniele Rufini, Danilo vincenzo Zollo, Sara Turco, Gianluca Onori, Renzo Valente, Enrico Valigi, Francesco Amadei
Enel Grids, Italy

10303 *Voltage Regulation in a LV Distribution Network (With Renewables, Storage Systems and Electric Vehicles) – An Optimization Formulation*
Michel Minoux, Dominique Croteau, Andrea Laugere, Riadh Zorgati
1: Paris-Sorbonne University; 2: EDF Lab Paris Saclay, France

10305 *Metric for Analysing Cooperative and Competitive Algorithms for Distributed Frequency Control in Microgrids*
Maximilian Kilthau, Alexandra Karmann, Christian Derksen, Alexander Fay
1: Helmut Schmidt University / University of the Federal Armed Forces Hamburg, Germany; 2: University of Duisburg-Essen, Germany

10314 *An Efficient Hybrid Control and Protection Strategy for Frequency Regulation of Low-Inertia Power System*
Ahmed Elmelegi, Loai Nasrat, Mokhtar Aly, Emad A. Mohamed
1: Upper Egypt Electricity Distribution Company, Egypt; 2: Aswan University, Faculty of Engineering, Egypt; 3: San Sebastian University, Chile

10326 *Conceptual Design of Special Protection Scheme for Enhancing Renewable Energy Integration*
Jirapa Kamsamrong, Mohannad Aldebs, Henrik Kringel, Jürgen Meister
1: OFFIS Institute, Germany; 2: TenneT TSO GmbH; 3: 50Hertz Transmission GmbH

10336 *Evaluation Effects And Preliminary Designing Of Sheath Reactors For Mitigation Of Overcurrent Flowing Through The Earthed Elements Of Underground Cables Following Cross Country Faults On MV Network*
Luigi D'Orazio, Alberto Cerretti, Alberto Geri, Fabio Massimo Gatta
1: ENEL, Italy; 2: University of Rome "La Sapienza", Italy

10344 *Requirements For Generating Plants To Be Connected In Parallel With Distribution Networks - Focus On EN 50549 Series*
Alberto Cerretti, Christian Noce, Herve Rochereau, Thoms Schaupp
1: ENEL, Italy; 2: Enel X, Italy; 3: EDF, France; 4: TransnetDW GmbH, Germany

10352 *The Potential of Emerging Communications Technologies in Distribution Grid Management*
Seppo Borenius, Pekka Kekolahti, Matti Lehtonen, Raimo Kantola, Heli Kokkoniemi-Tarkkanen, Jose Costa-Requena
1: Aalto University, School of Electrical Engineering, Finland; 2: VTT Technical Research Centre of Finland

10378 *A Physical-Neural Network Approach For Residential Load Forecasting With Dynamic Load Control*
Taha Nakabi, Christina Brester, Mikko Kolehmainen, Harri Niska
1: Tecnotree Ltd; 2: University of Eastern Finland, Finland

10401 *Optimising the Safety, Reliability and Efficiency of rural distribution networks*
Hugh Borland, Wojciech Petrowski
1: Anseris IQ, Ireland; 2: Anseris IQ, Poland

10429 *Distributed Ledger Technology for Monitoring Operations Carried out on the Embedded Generation Units*
David Vangulick, Saul Escalona, Damien Ernst
1: ORES, Belgium; 2: ULIEGE

10435 *Open Phase Fault Analysis in MV Distribution Grids with Resonant Grounding*
Tomáš Škumát, Martin Horák
Západoslovenská distribučná, a. s., Slovak Republic

10446 *A Cyber-Physical Digital Twin Approach to Replicating Realistic Multi-Stage Cyberattacks on Smart Grids*
Ömer Sen, Nathalie Bleser, Martin Henze, Andreas Ulbig
1: Fraunhofer FIT, Germany; 2: IAEW at RWTH Aachen, Germany; 3: Fraunhofer FKIE, Germany

10450 *Performance Evaluation of an Autoencoder State Estimator with Realistic Low Voltage Grids Reconstructed from Open Data*
Elio El Semaan, Dat Tien Nguyen, Alessio Iovine, Trung Dung Le, Philippe Dessante, Keddy Kamga, Dominique Croteau, Mouna Rifi
1: GeePs, CentraleSupélec, France; 2: L2S, CentraleSupélec, France; 3: EDF R&D, France

10451 *A Standards-Based Engineering Framework for Virtualized Protection, Automation, and Control Systems*
Nadine Kabbara, Thierry Coste, Jerome Cantenot, Adrien Vialle, Hugo Morais, Madeleine Gibescue
1: EDF R&D, France; 2: INESC-ID, Portugal; 3: Utrecht University, Netherlands

10473 *Practical Review And Advancements In Testing Multi-Vendor Digital Substations*
Rick Loenders, Thomas Lisiecki, Iskender Yesil
1: KULeuven; 2: Tractebel, Belgium

10478 *DLR as the Tool for Providing Flexibility Services in the Distribution Network*
Adam Babs, Tomasz Samotyjak, Marcin Tarasiuk, Slawomir Noske
1: Institute of Power Engineering, Poland; 2: ENERGA-OPERATOR SA

10481 *Optimised Operational Management Of Distribution Grids By Utilising Flexibilities Through Automation Of Electrical Assets Using A Multi-Agent-System Approach*
David Riebesel, Simon Schramm, Gert Mehlmann, Matthias Luther
Friedrich-Alexander Universität Erlangen-Nürnberg, Institute of Electrical Energy Systems, Germany

10488 *Estimation Of TOVs Due To Single Phase To Earth Fault By Means Validated Model By Comparison With Measurements From Real Fault Tests*
Luigi D'Orazio, Alberto Cerretti, Gianluca Sapienza, Stefano Riva, Pietro Paulon
1: ENEL, Italy; 2: Grispertise, Italy

10504 *Differential Voltage Grid Protection*
Mauro Sergio Silveira, Alexandre Vieira de Oliveira, Eliana Roratto de Andrade, Heliton de Oliveira Vilibor, Odair José Schirmer, Leonardo do Nascimento Pereira
CPFL, Brazil

10519 *A Robust Fault Location Method for MV Distribution Feeders*
Alexandre Bach, Trung Dung Le, Marc Petit
Université Paris-Saclay, CentraleSupelec, CNRS, Laboratoire de Génie Electrique et Electronique de Paris, 91192, Gif-sur-Yvette, France. Sorbonne Université, CNRS, Laboratoire de Génie Electrique et Electronique de Paris, 75252, Paris, France

10524 *AI-Based Controller for Grid-forming Inverter-Based Generators Under Extreme Dynamics*
Hassan Issa, Vincent Debusschere, Lauric Garbuio, Philippe Lalanda, Nouredine Hadjsaid
1: Univ. Grenoble Alpes; 2: Grenoble INP

10526 *Fault Location Method for Medium Voltage Cables Using Measured Sheaths Current in the Presence of Renewable Energy Resources*
Arman Ghaderi Baayeh, Michael Kleemann
KU Leuven, Technology Campus Ghent, Belgium

10527 *Arc Flash Mitigation on Main LV Switchboards by Protecting HV/LV Transformers Using Circuit Breakers*
Isabelle Gal, Nicolas Choulet
Schneider Electric, France

10541 *A Comparison Between Different Inertia Estimation Algorithms in Smart Grids Applications*
Davide Gotti, Pablo Ledesma Larrea, Hortensia Amaris Duarte, Samuele Grillo
1: Universidad Carlos III de Madrid, Spain; 2: Politecnico di Milano, Italy

10550 *Characterisation of Sequence Components of Islanded Microgrid with Low Fault Current*
Nadia Afrin, Mark Hibbert
eleXsys energy, Australia

10551 *A Study on the Protection Scheme for LVDC Distribution System in Commercial Buildings*
Ducksu Lee, Jonghyun Lee, Seongyong Lee, Jihong Kim
HYUNDAI ELECTRIC & ENERGY SYSTEMS CO., LTD., South Korea

10562 *Distribution Automation System Field Test in Jakarta MV Network*
Anggoro Primadianto, Karina Monica, Riki Waberta, Andi Tobing
PLN Indonesia, Indonesia

10582 *HIL Testing and Future-Proofing of UFLS Schemes*
Patrick Favre-Perrod, Marco Burri, Michael Schueller, Nicolas Stieger, Walter Sattinger, Bruno Wartmann
1: HES-SO, Switzerland; 2: OST, Switzerland; 3: Swissgrid, Switzerland; 4: ewz, Switzerland; 5: BKW, Switzerland

10590 *A Dynamic Voltage Controller For LV Grids Based On Flexible PV Systems And The Smart Metering Infrastructure*
Ali Hamdan, Benoit Vinot, Florent Cadoux
Roseau Technologies, France

10592 *Generic Methodology For Protection Plan Analysis With Inverter-Based Grid Forming And Grid Feeding Resources*
Maxime Velay, Gaetan Villeret, Benoit Jacquet, Florence Lemaitre, Boris Deneuville
EDF, France

10597 *Machine-Learnt State Estimation For Optimization In Low Voltage Distribution Grids*
Sarah Reisenbauer, Bharath-Varsh Rao, Gregor Taljan
1: AIT Austrian Institute of Technology GmbH, Austria; 2: Energienetze Steiermark GmbH

10600 *An Interoperability-by-Design Approach For Designing Smart Grid Solutions*
Jawad Kazmi, Mark Stefan, Marjolaine Farre
1: AIT Austrian Institute of Technology GmbH, Austria; 2: Trialog, France

10602 *A Real-Time Optimal Operation Strategy for Active and Reactive Power Sources in Smart Distribution Systems*
Akbar Bayat, Amir Bagheri, Saeed Behzadi
1: Zanjan Electric Distribution Company Zanjan, Iran; 2: Department of Electrical Engineering, University of Zanjan, Zanjan, Iran

10603 *Microgrid Control Strategy to Achieve Seamless Transition from Grid Connected to Islanded Mode*
Samuel Kamajaya, Jerome Buire, Raphael Caire, Seddik Bacha, Jean Wild
1: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, Grenoble, France; 2: Schneider Electric, France

10612 *Is the Cybersecurity Standard IEC62443 Applicable to Distribution Substations?*
Juha Rintala, Mika Loukkalahti, Shyam Musunuri, Joose Haapaniemi, Christoph Hampel
1: Siemens Osakeyhtiö; 2: Helen Sähköverkko Oy; 3: Siemens AG; 4: Helen Oy

10628 *Developing Low-Voltage Operational Functionalities*
Mikko Haapamäki, Mika Loukkalahti, Juho Kuokkanen, Mika Nousiainen, Pirjo Heine, Matti Lehtonen
1: Helen Electricity Network Ltd., Finland; 2: Aalto University, Finland

10646 *Multidomain Considerations Of Secondary Maintenance Approaches To Ensure The Reliability Of Network Protection Systems*
Oliver Skrbinjek, Horst Paar, Christian Michalka, Richard Marenbach
1: Energienetze Steiermark GmbH, Austria; 2: OMICRON electronics Deutschland GmbH

10647 *Novel Touch Voltage-Based Earth-Fault Current Protection For Ensuring Dependability And Electrical Safety In Modern Compensated MV-Distribution Networks*
Ari Wahlroos, Janne Altonen, Sakari Kauppinen, Hanna-Mari Aalto, Risto Pitkänen
1: ABB Oy, Finland; 2: ALVA Sähköverkko Oy, Finland; 3: Elenia Verkko Oyj, Finland; 4: Finland

10655 *The impact of Neutral Treatment and Earth Fault Protection on Resiliece and Reliability of High Voltage Grid*
Klaus Winter, Johan Hollander, Viacheslav Levashov
1: Holmgren Institute Stockholm; 2: Swedish Neutral Company

10656 *Virtualised Centralised Protection and Control – Constellation Project Case Study*
Anna Kulmala, Ontrei Raipala, Petri Hovila, Boris-Emanuel Yazadzhiyan, Rui Dantas, Colin Scoble
1: ABB, Finland; 2: UK Power Networks

10689 *On-line and Adaptive Protection System to Resolve Load Blinding Protection Scheme Limits in Networks with Highly Integrated DERs*
Reza Ganjavi, Colin Scoble, Rui Dantas, Boris Yazadzhiyan, Hakan Kasap, Sebastian Hann, Georg Janick Meyer, Johann Jaeger, Nishanta Bhadra
1: Siemens AG, Germany; 2: UK Power Networks; 3: Friedrich-Alexander University

10690 *Frequency Droop Characteristic for Grid Forming Battery Inverters – Operation in Islanded Grids with the Infeed of Distributed Generation Systems*
Tobias Lechner, Sebastian Seifried, Johanna Timmermann, Claudia Bernecker-Castro, Georg Kerber, Kathrin Schaarschmidt, Steffen Herrmann, Michael Finkel, Rolf Witzmann
1: Augsburg University of Applied Sciences, Germany; 2: Technical University of Munich, Germany; 3: Munich University of Applied Sciences, Germany; 4: LEW Verteilnetz GmbH, Germany; 5: AVS Aggregatebau GmbH, Germany

10702 *Real-Time Performance of Virtualised Protection and Control Software*
Sandro Schönborn, Robert Birke, David Kozhaya, Thanikesavan Sivanthi
ABB Corporate Research, Switzerland

10717 *A Validation of IED for Networked Distribution System*
Woo-Hyun Kim, Woo-Kyu Chae, Hyeon-Myeong Lee, Ju-Yong Kim
KEPRI, South Korea

10725 *5G Edge for Power System Applications*
Heli Kokkoniemi-Tarkkanen, Petra Raussi, Seppo Horsmanheimo, Petri Hovila, Anna Kulmala, Seppo Borenius
1: VTT Technical Research Centre of Finland, Finland; 2: ABB, Finland; 3: Aalto University, Finland

10729 *Implementation and Test of Frequency Estimation Methods for RoCoF-based Load Switching in Islanded Grids*
Sebastian Seifried, Simon Fischer, Dominik J. Storch, Tobias Lechner, Michael Finkel, Rolf Witzmann
1: University of Applied Sciences Augsburg; 2: Technical University of Munich

10736 *Converter-Driven Stability In A Distribution Grid With High Penetration Of Inverter-Based Generation*
Phuong Huynh Minh, Arshpreet Singh, Vincent Debusschere, Nouredine Hadjsaid, Marie-Cécile Alvarez-Hérault, Xavier Legrand, Benoit Bouzigon
1: University Grenoble Alpes, CNRS, Grenoble INP, G2ELab; 2: Enedis; 3: Nanyang Technological University

10744 *Improved Method for Earth Fault Location in MV Distribution Networks with Compensated Neutral Grounding*
Elie Salhab, Marc Petit, Trung Dung Le, Dominique Croteau, Quentin Lebourg
1: EDF R&D, France; 2: CentraleSupélec, GeePs, France

10751 *Delivering The Benefits From A Common Disturbance Information Platform To Prevent Unplanned Outages*
Paul Morris, Mashood Tahir, Sid Hoda, Samuel Jupe
1: National Grid Electricity Distribution, United Kingdom; 2: Nortech Management Ltd

10760 *E-REDES' IEC61850 Specification for PAS Interoperability*
João Ricardo, Hugo Melo, Miguel Castanheira Marques, Celso Filipe Silva, André Pereira, José João Cardoso, Elisa Abrantes, Luís Pires, José António Gonçalves
1: EDP Labelec, Portugal; 2: E-REDES, Portugal

10769 *Automated Detection of Non-Compliance with DER Interconnection Requirements and the Laboratory Testing of an EDF developed solution*
Quentin Morel, Jingyuan Wang, Charles Brewster, Aminul Huque
1: EDF, United States of America; 2: EPRI, United States of America

10773 *Economic Model Predictive Control for the Energy Management Problem of a Virtual Power Plant Including Resources at Different Voltage Levels*
Luca Santosuosso, Simon Camal, Alessandro Di Giorgio, Francesco Liberati, Andrea Michiorri, Guillaume Bontron, George Kariniotakis
1: MINES Paris PSL, France; 2: Sapienza University of Rome, Italy; 3: Compagnie Nationale du Rhône, France

10777 *Secure and Resilient IoT and Cloud-Based Infrastructure for Electric Vehicles Recharge Systems*
Elisa Albanese, Roberta Terruggia
Ricerca sul Sistema Energetico - RSE S.p.A., Italy

10788 *Field Validation of a Novel Fault Location Solution Using Synchronized Phasor Measurements in Active Distribution Networks*
Mayank Nagendran, Lorenzo Zanni, Paolo Romano, Marco Pignati
Zaphiro Technologies, Switzerland

10793 *TVP Liquid Immersed Transformers Protection Against Fast Transients*
Pawel Klys, Suhel Patel
1: Hitachi Energy Poland; 2: Hitachi Energy India

10808 *Root/Chain of Trust in Complex Energy Distribution Systems*
Imanol Garcia-Pastor, Sandra Plaza, Manuel Morillo
Ingeteam Power Technology, Spain

10815 *Selfhealing - FLISR in Underground and Overhead Real the First Performance Results*
José Gonçalves, Rita Ramilo Cadete, João Carvalho, Rui Parreira, João Nunes Carreira, Carlos Fortunato, Paulo Ribeiro, Sérgio Lopes, João Rosa, Ricardo Nunes, João Basílio, Miguel Grossinho
E-REDES, Portugal

10816 *Primary Substation Protection and Control System: Future Architecture Proposal*
Hugo Melo, José Gonçalves, Filipe Vale, Luís Pires
E-REDES, Portugal

10824 *Short-Circuit Currents Characterization for Future Converter-Based Power Systems*
Deepak Deepak, Matthias Buchner, Krzysztof Rudion, Christoph John, Hans Abele
1: University of Stuttgart, Germany; 2: Transnet BW, Germany

10855 *Real-Life Pilot Of Virtual Protection And Control – Experiences And Performance Analysis*
Jani Valtari, Anna Kulmala, Sandro Schoenborn, Robert Birke, David Kozhaya, Jyrki Reikko
1: ABB Oy, Finland; 2: ABB Corporate Research, Switzerland; 3: Caruna Oy, Finland; 4: University of Torino, Italy

10856 *Distribution Network Fault Prediction Utilising Protection Relay Disturbance Recordings and Machine Learning*
Ebrahim Balouji, Karl Bäckström, Viktor Olsson, Petri Hovila, Henry X. Niveri, Anna Kulmala, Ari Salo
1: Eneryield; 2: ABB; 3: Vaasan Sähköverkko

10877 *Performance Of A Digital Distance Protection Relay During Short Circuits In Presence Of A Converter Connected Grid*
Maximilian Heinz Brestan, Manuel Galler, Georg Achleitner, Lothar Fickert, Robert Schuerhuber
1: Graz University of Technology, Austria; 2: Austrian Power Grid, Austria

10880 *Voltage Regulation in the LV Network with Variable Generation Based on Online Measurements from Smart Meters with the use of the On-Load Tap Changer*
Slawomir Noske, Adam Babs, Lukasz Kajda, Miroslaw Matusewicz
1: ENERGA-OPERATOR SA, Poland; 2: Institute of Power Engineering Poland

10951 *Fault Location for Multi-Terminal Lines*
Cezary Dzienis, Joerg Blumschein, Jens Hauschild
1: University of Applied Sciences, Germany; 2: Siemens AG; 3: 50Hertz Transmission

10953 *Investigating the Impact of Topology Changes and Distributed Renewable Generation on the Protection Behaviour at Medium-voltage Level*
Antigona Selimaj, Pascal Ritzka, Immanuel Hacker, Maxim Müllender, Andreas Ulbig
RWTH Aachen University, Germany

10955 *A Study on the Fault Current Limiting and Interrupting Operation Technology of MVDC Systems Using a Protective Equipment*
Kyu-Hoon Park, Muhammad Usman, Il Kwon, Yu-Jin Kwak, Bang-Wook Lee
Hanyang University, South Korea

10958 *Supervised Learning for Fault Classification Using Hybrid Training Datasets*
Archana Ranganathan, Simon Tindemans, Frans Provoost
1: Alliander N.V.; 2: Technische Universiteit Delft; 3: Qirion B.V.

10971 *LV Automation Solutions for Resilient, Flexible and Optimized Smart Distribution Grids*
Imanol López Goiti, Haritz Zubia Urrutia, Esther Plasencia Alonso, Markel Sanz Heras
1: Merytronic; 2: Ariadna Grid; 3: Pronutec; 4: i-DE

10974 *Phase-to-Earth Faults Causing Inaccuracy of Distance Protection in Low Impedance Earthed Power Systems*
Rainer Luxenburger, Gregor Policht, Michael Albert
1: OMICRON, Germany; 2: Netze BW GmbH

10988 *Hardware-In-The-Loop Investigation Of Distance Protection Algorithm In Grids With Dominant Decentralized Generation Units*
Manuel Galler, Philipp Hackl, Robert Schürhuber
University of Technology Graz, Austria

10995 *Challenge: Frequency Measurement In Different Applications*
Michael Albert, Rainer Luxenburger
OMICRON electronics Deutschland GmbH, Germany

10999 *A 5G Communication-Based Wide Area Protection Concept for Enabling Resilient and Reliable Loss of Mains Protection*
Ontrei Raipala, Anna Kulmala, Petri Hovila, Boris-Emanuel Yazadzhiyan, Rui Dantas, Colin Scoble
1: ABB, Finland; 2: UK Power Networks, UK

11018 *Alternative Low-Frequency Demand Disconnection (LFDD) Solutions for UK Distribution Network Operator Implementation*
Abdullah Emhemed, Nathan Bryson, Ryan Huxtable, Can Li
1: WSP UK Limited, United Kingdom; 2: WSP UK Limited, United Kingdom; 3: National Grid; 4: National Grid ESO

11022 *Object Detection Algorithms Applied On Low Voltage Grid Equipment*
Mohcine El Harras, Christophe Birkle, Julien Bruschi, Samuel Sallaud
1: EDF R&D, France; 2: Enedis, France

11033 *Decentralized Management of Distributed Energy Resources for Frequency Support – Finnish Pilot*
Matti Aro, Jerome Ferrari, Mikael Opas, Raphael Caire
1: VTT Technical Research Centre of Finland, Finland; 2: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, Grenoble, France

11037 *Key Performance Indicators (KPI) For The Testing Process Of An IED*
Michael Albert
OMICRON electronics Deutschland GmbH, Germany

11038 *A New Adaptive Auto Reclosure Approach With Secondary Arc Detection*
Angelika Vogel, Yilmaz Yelgin
Siemens AG, Germany

11040 *A Collaborative Engineering and Validation Framework for Smart Grid Automation Applications – The PowerTeams Approach*
Christof Brandauer, Stefan Linecker, Filip Pröstl Andrén, Catalin Gavriluta, Thomas Strasser, Armin Veichtlbauer, Gerald Steinmaurer, Jürgen Resch, Sebastian Schöndorfer
1: Salzburg Research, Austria; 2: AIT Austrian Institute of Technology, Austria; 3: FH Oberösterreich, Austria; 4: COPA-DATA, Austria

11042 *Validation Of MPLS-TP For Tele-Protection / Current Differential Protection Services Via Proof Of Concept*
Davy Haegdorens, Mohd Mokhlis Abdul Wahib, Gurdial Singh Nacatar Singh, Mohd Nasim Zakaria, Muzalifah Hanim Zarmani, Ahmad Farid Mohd Perdaus, Rahimah Uzir
1: OTN Systems, Belgium; 2: Tele-Flow Corporation Sdn Bhd, Malaysia; 3: Tenaga Nasional Berhad, Malaysia; 4: TNB Researcher Sdn Bhd, Malaysia

11058 *Cognitive Data Fusion for Improving Flexibility in Smart Homes*
Surender Redhu, Rameez Raja, Bernt A. Bremdal, Heidi S. Nygård
1: Smart Innovation Norway, Norway; 2: Østfold University College, Norway; 3: University of Tromsø, Norway; 4: NMBU, Norway

11078 *Automated MV Switching Based On AMI Data*
Rui Filipe Parreira, José Eduardo Sousa, João Nunes Carreira
E-Redes, Portugal

11085 *Load Modelling for Volt-var Optimization Control in Limited Network Visibility – a Case Study in Malaysia*
Chin Kim Lo, Shong Ching Calvin Ku, Azlan Abdul Rahim
1: TNB Research Sdn. Bhd., Malaysia; 2: Tenaga Nasional Berhad, Malaysia

11124 *Building a Realistic Sampler to Emulate Communication Delays in PLC-Operated Low Voltage Networks*
Mahmoud Rashad Ahmed, José Manuel Cano, Pablo Arboleya
University of Oviedo, Spain

11125 *Automatic System for Evaluation of Lightning Events in Power Grid*
Martin Knenicky, Martin Svancar, Lubomir Kocis, Petr Spurny, Radek Ovesny
1: EGU - HV Laboratory a.s., Czech Republic; 2: CEPS, a.s., Czech Republic

11128 *Optimized Low Voltage Power Fuses For Current Requirements In Low Voltage Power Grids*
Lukas Büttner, Christian Hildmann, Stephan Schlegel, Markus Lippold
1: TU Dresden, Germany; 2: SIBA GmbH

11144 *PMU-Based State Estimation and Fault Analysis in Active Distribution Grids: A Case Study for Kythnos Island, Greece*
Themistoklis Xygkis, Orestis Darmis, Georgios Karvelis, Aris Dimeas, George Korres, Nikos Hatziargyriou
National Technical University of Athens, Greece, Greece

11156 *From blackouts to flexibility: case study from Burkina Faso*
Sebastijan Ursic, Luc Richaud, Marine Cornelis
1: INEA d.o.o, Slovenia; 2: Odit-e, France; 3: Next Energy Consumer, Italy

11172 *Evaluation and Influences of Harmonic Earth Fault Currents*
Ari Nikander, Pertti Pakonen
Tampere University, Finland

11173 *Development of Local Autonomous Method for Power Distribution System with Battery Storage System*
Naoyuki Takahashi, Kentaro Fukushima, Hiroyuki Hatta
Central Research Institute of Electric Power Industry, Japan

11180 *5G-Based Fault location, Isolation, and Service Recovery*
Mohand Ouamer Nait Belaid, Vincent Audebert, Boris Deneuville, Rami Langar
1: EDF SA, France; 2: Gustave Eiffel University, France

11181 *Operational Considerations for Substation Security*
Abhilash Appukuttan, Andrew Darby, Abraham Varghese
GE, United Kingdom

11189 *Equivalent DC Impedance of a Three-phase Impedance through an Inverter*
Quentin Delhaye, Marc Bekemans, Emmanuel De Jaeger
UCLouvain, Belgium

11197 *Interoperability Raises Two Challenges: Cybersecurity & Maintenance*
Mathieu Salles, Hervé Bigeard
Schneider Electric, France

11200 *Interconnected Grid Protection Systems – Reference Grid For Testing An Adaptive Protection Scheme*
Tobias Lorz, Johann Jaeger, Antigona Selimaj, Immanuel Hacker, Andreas Ulbig, Jan-Peter Heckel, Christian Becker, Markus Dahlmanns, Ina Berenice Fink, Klaus Wehrle, Gerrit Erichsen, Michael Schindler, Rainer Luxenburger, Guosong Lin
1: FAU Erlangen-Nuernberg, Germany; 2: Siemens AG; 3: Schleswig-Holstein Netz AG; 4: RWTH-Aachen - IAEW; 5: RWTH-Aachen - COMSYS; 6: TUHH - IEET; 7: Lechwerke AG; 8: OMICRON electronics GmbH

11207 *Four Problems for Digital Substations I wish to be solved*
Fred Steinhauser
OMICRON electronics, Austria

11214 *A secure Automation Solution to Provide Flexibility at Low-Level Grid – Middleware Services*
Razgar Ebrahimy, Mohsen Banaei, Juan Jacobo Peralta Escalante, Manuel Diaz Rodríguez, Krzysztof Piotrowski, Jaime Chen Gallardo, Henrik Madsen
1: Technical University of Denmark; 2: Centro de Estudios de Materiales y Control de Obra, S.A. (CEMOSA); 3: Softcrits; 4: Innovations for High Performance Microelectronics (IHP)

11216 *Architecture of Advanced Distribution Grid Voltage Control Method Utilizing Edge Computing Solution*
Sami Repo, Antti Supponen, Kalle Ruuth, Kenneth Rosenørn, Michael Møller
1: Tampere University, Finland; 2: Green power Denmark; 3: RAH A/S

11218 *Semi-Distributed Automatic Scheme for Self-Healing Implementation in Distribution System*
Candra Agus Dwi Wahyudi, Karina Monica, Luthfi Arsyadani
PT PLN (Persero), Indonesia

11222 *Challenges and Considerations for the Design and Implementation of a Centralized Protection and Control Solution for MV Networks*
Ana Cristina Aleixo, Rui Dias Jorge, Fernando Gomes, Lourenço Antunes, João Paulo Barraca, Ricardo Carvalho, Mário Antunes, Diogo Gomes, Clara Gouveia, António Carrapatoso, Everton Alves, José Andrade, Luís Gonçalves, Francisco Falcão, Bruno Pinho, Luís P
1: Efacec; 2: IT - Instituto de Telecomunicações; 3: INESC TEC - Institute for Systems and Computer Engineering, Technology and Science; 4: ARMIS; 5: E-REDES

11227 *Software Defined Substation Automation*
Peter Hemmer, Edwin Melenhorst, Raymond Woertman
Locamation, The Netherlands

11248 *Implementation Of An Advanced Remote Engineering Platform*
Indrek Künnapuu, Rene Voog, Ameen Hamdon
1: Elektrilevi OÜ; 2: Enefit Connect OÜ; 3: SUBNET Solutions Inc.

11274 *Secondary Wiring Checks by Combining Sawtooth Polarity Detection and Voltage Measurement*
Josef Schmidbauer, Tim Walker
1: OMICRON Electronics, Austria; 2: OMICRON Electronics, USA

11276 *Edge Computing for Improving Energy Management in Smart Homes*
Surender Redhu, Aditya Singh, Bernt A. Bremdal
1: Smart Innovation Norway, Norway; 2: Indian Institute of Technology Kanpur, India; 3: University of Tromsø, Norway

11280 *Functional Testing of Virtualized and Centralized Protection Systems*
Janne Starck, Jani Valtari, Robert Coggan, Juanita Dominguez, Christopher Pritchard
1: ABB, Finland; 2: Energy Queensland, Australia; 3: Omicron, Austria

11284 *First Practical Results Of Continuous Grid-Serving Power Control In Low-Voltage Network Via Novel Power Management Concept*
Ghayathri Suriyamoorthy, Kamil Korotkiewicz, Martin Stiegler, Peter Kellendonk, Wolfgang Zander
1: PSI GridConnect GmbH, Germany; 2: EEBus Initiative e.V., Germany; 3: BET GmbH, Germany

11293 *AI To Detect Anormal Switching Operations*
Georg Achleitner, Werner Schöffer, Juergen Plesch, Wolfgang Huska
1: Austrian Power Grid AG, Austria; 2: ARTEMES, Austria

11304 *High Impedance Fault Detection for MV Distribution Networks*
Roberto Cimadevilla, Alex Moreno
ZIV, Spain

11306 *An Edge-Fog Computing Approach For Advanced Distribution Management Systems For The Low-Voltage Network*
Matias Ariel Kippke, Leo Marcelo Villalba, Pablo Arboleya Arboleya
Universidad de Oviedo - Laboratory for Electrical Energy Management Unified Research (LEMUR), Spain

11311 *Protection System Analysis in Microgrids with DSO Static Generation*
Bruno Ceresoli, Lucio Barbato, Gianpatrizio Bianco, Gianni Ceneri, Ettore De Berardinis, Luigi Mascolo, Chiara Micillo
1: Gridspertise Srl, Italy; 2: e-distribuzione SpA, Italy; 3: CESI SpA, Italy

11318 *Control Architecture and Algorithms for Isolated Microgrids*
Cosimo Iurlaro, Lucio Barbato, Gianpatrizio Bianco, Sergio Bruno, Gianni Ceneri, Massimo La Scala, Luigi Mascolo, Marco Menga, Chiara Micillo, Francesco Renna, Gianluca Sapienza
1: Gridspertise Srl, Italy; 2: Politecnico di Bari, Italy; 3: e-distribuzione SpA, Italy

11326 *Centre of Angles based Remedial Action Scheme using Synchrophasor Measurements in SP Transmission Network*
Shafqat Hussnain, Muhammad Junaid
SP Energy Networks, United Kingdom

11337 *A New Approach To Protection In An Unconventional Distribution*
Leonardo Felipe da Silva dos Santos, Miguel Spagnolo Martins, Leyla Kraulich, Leonardo de Freitas Silveira, Gustavo Marchesan, Aécio de Lima Oliveira, Ghendy Cardoso Junior, Rogimar Matias Rêgo
1: Universidade Federal de Santa Maria, Brazil; 2: Grupo Equatorial Energia / CEEE-D

11343 *Improvement Of Cable Fault Performance Using A Ground Resistor In Series With An Artificial Neutral*
Andre Neves, Luis Rosa, Jose Soares, Paulo Bras, Paulo Lopes, Ines Almeida, Hugo Melo, Miguel Louro
E-REDES, Portugal

11368 *Grid-Forming Control Modelling and Validation for Distribution Systems with Networkable Microgrids*
Jay Ramesh Sawant, Rishabh Jain, Annabelle Pratt
National Renewable Energy Laboratory, United States of America

11370 *Intermittent Earth Fault Detection in Distribution Network based on the voting classification technique*
Meysam Pashaei, Suzana Pil Ramli, Arta Asadi, Alireza Pourdaryaei, Mazaher Karimi, Kimmo Kauhaniemi
1: University of Vaasa, Finland; 2: Islamic Azad University, Iran; 3: Hormozgan Regional Electric Company, Bandar Abbas, Iran

11373 *Concept And Implementation Of A Gird Simulation Framework Utilizing Containerized IEC 61850 Compatible IED*
Shuo Chen, Jeromie Morris, Zhiyu Lu, Gerd Heilscher
1: Ulm University of Applied Sciences, Germany; 2: Ulm University, Germany; 3: Netze BW GmbH, Germany

11382 *Advancing the Capabilities of OpenDSS: A Directional Overcurrent Relay Feature for Modelling Modern Microprocessor Network Protector Operation Modes*
Celso Rocha, Andres Ovalle, Aadityaa Padmanabhan, Sean McGuinness
1: Electric Power Research Institute (EPRI), United States of America; 2: EPRI Europe DAC, Ireland

11383 *EPRI Distribution Protection Analysis Toolkit*
Andres Ovalle, Sean McGuinness, Aadityaa Padmanabhan, Celso Rocha, John Bannon, Mychal Kistler, Arun Doodnauth
1: Electric Power Research Institute, United States of America; 2: EPRI Europe DAC, Ireland; 3: PPL Electric Utilities, United States of America

11384 *Solving Issues Of The Distribution Network Of Harstad (Norway) In Real Time Using Machine Learning-Based Observability To Place Flexibility Orders*
Benoît Grosjean, Luc Richaud, Nuno Pinho da Silva, Ângelo Casalairo, Gregor Černe
1: Odit-e, France; 2: R&D Nester, Portugal; 3: INEA d.o.o, Slovenia

11389 *Low Voltage as the final frontier for Broadband over Power Line*
Inigo Berganza, Alberto Sendin, Raquel Ayala, Sebastian Gomez
Iberdrola, Spain

11401 *Demonstration of a Concept for the Data Management and Monitoring of Larger Scale DER Utilizing a Time-series Database*
Zhiyu Lu, Shuo Chen, Gerd Heilscher
1: Ulm University of Applied Sciences, Germany; 2: Ulm University,Germany

11419 *Decentralized Grid Control Using Power Grid State Estimation*
Eberhard Waffenschmidt, Markus de Koster, Christian Hotz, Sergej Baum, Ingo Stadler
TH-Köln, Germany

11434 *Impact of Three-Phase Inverter-Based Generating Units With Asymmetrical Power Redistribution on the Low-Voltage Network Operation*
Michal Vrana, Jan Klusacek, Jiri Dvoracek, Jan Moravek, Jiri Drapela, Petr Mastny, Matej Vrtal
Brno University of Technology, Czech Republic

11474 *Performance Evaluations For The Configuration Of IEC 62351 Cybersecurity Profiles In Energy Telecontrol Scenarios*
Mauro G. Todeschini, Giovanna Dondossola
RSE S.p.A., Italy

11479 *Development of Photovoltaic Power Generation Output Estimation Method Using Distribution System Sensor Information*
Kentaro Nagata, Naoyuki Takahashi, Satoshi Uemura
Central Research Institute of Electric Power Industry, Japan

11480 *The Smart Grid Lab in Hesse – Active Maximization of Annual Usage Time of Electrical Grids Using Flexibilities while Ensuring Data Security and Resilience at the same time*
Peter Birkner, Anja Schaldach, Ingo Jeromin, Athanasios Krontiris, Till Neukamp, Sophia Pfeffer
1: House of Energy e.V., Germany; 2: House of Energy e.V., Germany; 3: Darmstadt University of Applied Sciences, Germany; 4: Darmstadt University of Applied Sciences, Germany; 5: Darmstadt University of Applied Sciences, Germany; 6: Darmstadt University of Applied Sciences, Germany

11506 *Real Time Digital Simulation and IEC 61850 Standard: Interoperability Test Between OPAL-RT and Typhoon HIL Simulators*
Adriano Morais, Jhonathan Cassol, Ângelo Felipe Sartori, Daniel Bernardon, Diomar Lima, Wagner Hokama, Julia Beatriz Conceição, Ulisses Netto
1: Universidade Federal de Santa Maria, Brazil; 2: CPFL Energia; 3: Federal University of Technology – Parana – Brazil

Session 5 : Planning of Power Distribution Systems

10105 *Innovative Digital Solutions That Enable Local Energy Communities to Provide Flexibility Services to the DSO: the Avacon Approach*
Ilaria Losa, Benjamin Georg Petters, Navreet Dult
1: RSE, Italy; 2: AVACON, Germany

10107 *Large Scale Detection Of Voltage Level Violations In LV-grids Using Smart Meters*
Bart Kers, Marco Hoek
1: Stedin, The Netherlands; 2: Technolution, The Netherlands

10108 *A Risk-Based Approach for Development Planning of Radial Distribution Networks*
Zeljko Popovic, Stanko Knezevic, Dragana Radojcic
1: University of Novi Sad, Serbia; 2: Schneider Electric, Serbia

10144 *Co-simulation Framework for the Provision of Flexibility Services for Distribution System Operators Using Electric Heating Systems*
Yassine Naimi, Valentin Chesnet, Xavier Le Pivert
CEA, France

10159 *Enabling Distributed Energy Resources to Participate in Wholesale Energy Market and Provide Flexibility Services*
Peter K.C. Wong, John Theunissen
1: Eagles Engineering Consultants Pty Ltd, Australia; 2: AusNet Services, Australia

10161 *Development Of A Model To Optimize The Energy Efficiency Of Residential Building And Their Impact On The Low Voltage Grid*
Michael Dahms, Torsten Sowa
amperias GmbH, Germany

10164 *Planning Tool Of LV Network Of A MicroGrid Using Geographic Information Systems*
Humberto Carneiro de Sousa, Isaac Boates, Sarah Nasr, Ali El Akoum, Philippe Lazzerini, Victoria Tan, Jean Philippe Cosperec
1: EDF R&D, France; 2: EIFER, Germany; 3: EDF International Division; 4: EDF International Networks, France

10174 *Hosting Capacity for Electric Vehicles in Urban Medium Voltage Grids with Different Building Structure and Charging Strategies*
Simon Kreutmayr, Simon Niederle, Christoph J. Steinhart, Christian Gutzmann, Michael Finkel, Rolf Witzmann
1: Augsburg University of Applied Sciences, Germany; 2: Technical University of Munich; 3: SWM Infrastruktur GmbH & Co. KG

10192 *Partitioning of Distribution System into Resilient Clustered Microgrids Using Complex Network Approach*
Divyanshi Dwivedi, Pradeep Kumar Yemula, Mayukha Pal
1: ABB Ability Innovation Center, Asea Brown Boveri Company, Hyderabad 500084, India; 2: Department of Electrical Engineering, Indian Institute of Technology Hyderabad, Kandi, Sangareddy, Telangana 502285, India; 3: Corresponding Author

10193 *Causal Network Analysis To Study Evolution Of Distribution System With DER Integration*
D. Maneesh Reddy, Divyanshi Dwivedi, Pradeep Kumar Yemula, Mayukha Pal
1: ABB Ability Innovation Center, Asea Brown Boveri Company, Hyderabad 500084, India.; 2: Department of Mechanical and Aerospace Engineering, Indian Institute of Technology Hyderabad, Kandi, Sangareddy, Telangana 502285, India.; 3: Department of Electrica

10209 *Quasi-Dynamic Line Rating Spatial and Temporal Analysis for Network Planning*
Stella Hadiwidjaja, Sergio Daniel Montana Salas, Andrea Michiorri
1: National University of Singapore (NUS); 2: MINES Paris - PSL

10234 *Case Study: Using A Probabilistic Calculation To Determine The Lifetime Costs Of Assets With Alternative Gas Insulation*
Saskia Düsdieker, Katrin Veith, Frank Jenau
TU Dortund University, Germany

10251 *Mitigating and Preventing Electricity Distribution Congestion and Constraints Through Energy System Integration: an Integrated Energy System Analysis at DSO level*
Arjan van Voorden, Arjen Jongepier, Sangitha Harmsen, Tjebbe Vroon, Theo de Kruijf
Stedin, The Netherlands

10255 *Investment Efficiency Assessment On The Electric Grid by Group Of Control*
Guilaumé Kevin, Lacombe Bertrand, Sevault Pierre, Lacroix Bastien, Dirion Jean-Louis, Faivre Odilon
Enedis, France

10272 *Flexibility as a Cost-effective Solution Applied to MV Lines Investment Deferral: Guidelines to Study and Pinpoint Opportunities*
Julien Lucas, Jerome Moiziard
Enedis, France

10292 *Technical Benefit Assessment for Network Automation Plans*
Marta De Vita, Anna Lisa Frau, Agostino Galati, Carlos Alcaine Baquedano, Lilia Consiglio
Enel Grids, Italy

10295 *Voltage Demand Relationship Modelling for Future Energy Scenarios*
Mark Collins, Mark Rafferty, Colin MacKenzie, Kieran Bailey, Maurice Lynch, Darren Moran
1: Smarter Grid Solutions, United Kingdom; 2: Electricity North West Ltd., United Kingdom

10297 *Nested Energy Management System to Improve the Resilience of Remote Interconnected Microgrids.*
Fundiswa Mthethwa, Chandima Gomes, David Dorrell
University of the Witwatersrand, South Africa

10301 *Non-technical Losses Identification in Distribution Grids: A Hybrid Approach*
Marc Jené-Vinuesa, Mònica Aragüés-Peñalba, Andreas Sumper
Universitat Politècnica de Catalunya, Spain

10306 *Six-Sigma Technique to Identify Resilience Events on Electrical Networks*
Valerio Vallocchia, Agostino Galati, Carlos Alcaine Baquedano, Lilia Consiglio
Enel Grids, Italy

10315 *Correlation Analysis on the Application Potential of Voltage Regulating Distribution Transformers in Medium- and Low-Voltage Grids*
Patrick Wintzek, Markus Zdrallek, Julia Wack, Franco Pizzutto
1: University of Wuppertal, Germany; 2: Maschinenfabrik Reinhausen GmbH, Germany

10327 *Use Of Linky Smart Meter Data To Enhance The Diversity Factor Assessment In Real Networks*
Guilherme Ramos Milis, Marie-Cécile Alvarez-Herault, Raphaël Caire, Christophe Gay, Bruno Gourguechon
1: Enedis, France; 2: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, Grenoble, France

10346 *SENS – Tool for Planning and Operation of Smart Distribution Networks*
Tomislav Antić, Alen Hrga, Tomislav Capuder
University of Zagreb Faculty of Electrical Engineering and Computing, Croatia

10347 *Design to Shared Value Methodology Applied to Power Grid Technologies Adoption*
Carmen Santucci, Enrico Valigi, Francesco Amadei, Daniela Errico
Enel SpA, Italy

10348 *Graph Computing Techniques for Power Flow Resolution Considering Real Distribution Networks*
Francesca Soldan, Enea Bionda, Carlo Tornelli
RSE S.p.A., Italy

10354 *Representing Topology Uncertainty For Distribution Grid Expansion Planning*
Domenico Tomaselli, Paul Stursberg, Michael Metzger, Florian Steinke
1: Siemens AG, Germany; 2: TU Darmstadt, Germany

10360 *Consistency Assessment Method of Urban Distribution Network Planning Geospatial Layout Based on Fractal Theory*
Jiamin Yin, Wangtao Ji, Chengmin Wang, Ning Xie, Zhipeng Chen
1: Shanghai Jiaotong University, China; 2: Proinvent Technology, China

10370 *Data-driven AI Network Analysis*
Andrea Vermigli, Giulia Serafini, Gabriele Licasale, Alessio Montone
Enel Grids

10371 *Case-Based Probabilistic Load-Flow Calculation Considering The Correlative Interdependence Of Loads*
Tim Pfueller, Jutta Hanson
Technical University of Darmstadt

10379 *Efficient Integration of Electric Vehicles Through Optimal Charging and Reactive Power Support*
Damir Jakus, Josip Vasilj, Bosko Poljak, Danijel Jolevski
University of Split - FESB, Croatia

10382 *Determining the Accuracy of Average Fault Rates in Assessing the Risks of Individual Circuits*
Felix Peterken, Paul Morris
National Grid, United Kingdom

10383 *Climate Adaptation Plan for Distribution Networks*
Anna Lisa Frau, Gabriele Licasale, Alessio Pastore, Alessandro Rodella, Valerio Vallocchia
Enel Grids, Italy

10397 *Voltage Congestion Monitoring Through Machine Learning*
Rémy Cleenwerck, Wouter Parys, Jan Desmet, Thierry Coosemans
1: EVERGi, Vrije Universiteit Brussel, Belgium; 2: EELAB/Lemcko, Universiteit Gent, Belgium

10398 *ENeuron Project – Facilitating The Energy Transition In A Military Campus By Optimizing A Local Energy Community*
Carlos Cardoso, Rafael Rodrigues, Francisco Gomes, João Piedade, Gisela Mendes, Raquel Figueiredo, Rui Martins, Diogo Cabral
1: EDP Labelec, Portugal; 2: Marinha - Portuguese Navy, Portugal; 3: EDP NEW R&D, Portugal; 4: Smart Energy Lab, Portugal; 5: Högskolan I Gävle, Sweden

10424 *A Novel Approach on Monitoring Technical and Non-technical Losses in Distribution Networks*
Vahid Mottaghi, Maria Rashki Ghaleno, Mohammad Hekmat, Fateme Daburi Farimani, Navid Yektay
1: Esfahan Electricity Power Distribution Company (EEPDC); 2: Sunflower Industrial Research Company (SIRCO)

10440 *Main-Grid Versus Renewable MicroGrid Energy Supply A Case Study of Isolated Rural Areas in the Sultanate of Oman*
Ahmed Ibrahim Abri, Dr. Dharmasa P P
1: Mazoon Electricity Company, Oman; 2: National University

10449 *MWOA for Optimal Integration of Hybrid Renewable Resources into the Distribution Systems for Techno-Economic Benefits*
Ahmed Sami, ElSaeed Othman, Mohammed Ebrahim
1: Ministry of Electricity and Renewable Energy, Egypt; 2: Faculty of Engineering - Al Azhar University; 3: Faculty of Engineering at Shoubra - Benha University

10453 *Comparison of RMS and EMT Models of an Inverter-Based Generator with Fast-Frequency Response*
Anna Pfendler, Patrick Riess, Soham Choudhury, Rafael Steppan, Aaron Hebing, Jutta Hanson
Technical University of Darmstadt, Department of Electrical Engineering and Information Technology, Institute of Electrical Power Supply with Integration of Renewable Energy, Germany

10454 *Flexibility Inside: How To Seamlessly Embed Flexibility In Dso Activity*
Hubert Dupin, Pâmela Catrinque Martins
Enedis, France

10455 *Planning Principles for Hybrid AC/DC Underlay Grids in the Medium-Voltage Level*
Maxim Müllender, Julian Saat, Lasse Empen, Andreas Ulbig
1: IAEW at RWTH Aachen University, Germany; 2: RWTH Aachen University, Germany

10464 *Probabilistic Evaluation of Plug-in Electric Vehicles Impacts on the Steady-State Performance of a Distribution Network in Stockholm*
Priscila Costa Nascimento, Monika Topel Capriles
KTH Royal Institute of Technology, Sweden

10468 *Power Grid Model: a High-Performance Distribution Grid Calculation Library*
Yu Xiang, Peter Salemink, Bram Stoeller, Nitish Bharambe, Werner van Westering
Alliander N.V., The Netherlands

10474 *The Reliability Of The Electrical Distribution System Using The Markov Modeling Methodolog*
Enrico Carletti, Luciano Cocchi, Francesco Amadei, Giovanni Franzone, Jessica Rizzati, Massimo Bolognesi, Pierpaolo Moschella
Enel Italy

10475 *Modelling and Validation of Latent Heat Storage Systems for Demand Response Applications*
Rakesh Sinha, Pavani Ponnaganti, Jayakrishnan R Pillai, Birgitte Bak-Jensen, Carsten Bojesen
Aalborg university, Denmark

10480 *Assessment Of The Impact Of Future Electrification Scenario On An Urban Distribution Network*
Giacomo Vigano', Chiara Michelangeli, Marco Rossi, Diana Moneta, Daniele Clerici, Andrea Morotti, Caterina Pasetti, Alessandro Bosisio
1: Ricerca sul Sistema Energetico, Italy; 2: Unareti spa; 3: University of Pavia

10485 *Techno-Economical Approach on Establishing Zero Down Time Area To Promote Premium Reliability in Super Priority Tourism Destination*
Revi Aldrian, Daniel Tampubolon, Margi Setiyono, I Wayan Harimbawa, Fauzi Arubusman
PT PLN (Persero), Indonesia

10496 *Data-driven Assessment of Aggregated EV Charging Potential for Flexibility Procurement*
Emir Nukic, Jelena Ponocko
The University of Manchester, United Kingdom

10501 *Evaluation Of Dynamic Active Distribution Network Equivalents With Grid Forming Converters In The Context Of System Stability Studies*
Jakob Ungerland, Wolfgang Biener, Hendrik Lens
1: Fraunhofer Institute for Solar Energy Systems; 2: University of Stuttgart

10506 *New Approach into Material Supply Chain to Boost Industrial Capability*
Silvia Mannucci, Andrea Balena, Andrea Campi, Matteo Carraro, Francesco Amadei, Claudio Liberatore
Enel Grids, Italy

10509 *Grid Futurability - Network Development Strategy*
Anna Lisa Frau, Agostino Galati, Marta De Vita, Gabriele Licasale
Enel Grids, Italy

10510 *Primary Substation Open Standardisation Through Building Information Modelling (BIM) Implementation*
Alessio Gentile, Sergio Mangialavori, Germana Giannini, Giovanni Battista Franzone, Francesco Amadei
Enel Grids, Italy

10512 *A 2030 Snapshot of Public Smart EV Charging Stations*
Alastair Oldfield, Calum Watkins, Robert MacDonald, John Orr
1: SP Energy Networks, United Kingdom; 2: Smarter Grid Solutions, United Kingdom

10517 *Comprehensive Building Clustering as an Abstraction Method for Planning of Power Distribution Systems*
Paul Maximilian Röhrig, Nils Körber, Andreas Ulbig
1: IAEW at RWTH Aachen University; 2: Fraunhofer FIT Aachen

10520 *Bridging The Gap From Geographical To Electrical Modeling*
Sébastien Vallet, Benoit Vinot, Florent Cadoux
Roseau Technologies, France

10521 *Planning Methods For DC Lateral Electrification In Rural Africa*
Lucas Richard, Marie-Cécile Alvarez-Herault, David Frey, Bertrand Raison, Nicolas Saincy
1: G2Elab, France; 2: Nanoé, France

10540 *Conceptualization of Flexibility Solutions as an Alternative to Traditional Investment*
Inês Roça, Luís Coelho, Rui Bento
1: E-Redes, Portugal; 2: E-Redes, Portugal; 3: E-Redes, Portugal

10567 *Increase Hosting Capacity through Voltage Control Devices Setting Optimization Technology*
WON Nam Koong, Won Wook Jung, Sung Min Cho, Hyeong Jin Lee, Pyeong Ik Hwang
1: KEPCO, South Korea; 2: Pusan National University

10570 *A Comparative Study of Optimal Planning of Distribution Systems: AC/DC Architecture vs. Conventional Strategies*
Heitor Farias de Barros, Marie-Cécile Alvarez Hérault, Bertrand Raison, Quoc Tuan Tran
1: Univ. Grenoble Alpes, CNRS, Grenoble INP*, G2Elab, F-38000 Grenoble, France; 2: CEA-INES, Le Bourget du Lac, France

10574 *Economic and Technical Benefits of Integrated Power and Gas Grid Planning in Distribution Grids*
Joshua Jakob, Marlon Koralewicz, Marco Kerzel, Markus Zdrallek, Louis Wayas, Wolfgang Köppel, Bastian Bauhaus
1: University of Wuppertal, Germany; 2: DVGW Research Centre, Germany; 3: SWKiel Netz GmbH, Germany

10575 *Decision Support Tool For The Development Of Power Distribution Networks Based On AI Planning*
Sandra Castellanos, Marie-Cecile Alvarez-Herault, Philippe Lalanda
1: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, 38000 Grenoble, France; 2: Univ. Grenoble Alpes, CNRS, Grenoble INP, LIG, 38000 Grenoble, France

10588 *Increasing the Renewables' Hosting Capacity by Topology Optimization of Neighbouring Medium Voltage Grids*
Achraf Kharrat, Marcel Böhringer, Jutta Hanson, Lars Weispfenning, Athanasios Krontiris, Ingo Jeromin, David Petermann, Nicole Büchau
1: Technical University of Darmstadt, Germany; 2: Darmstadt University of Applied Sciences, Germany; 3: e-netz Südhessen AG

10593 *A Novel DSO Approach In Proactively Upgrading The LV Distribution Network For Electrification Of Heat And Transport*
Padraig Coughlan, Francisco Romo, Tara Ni Reachtagain, Dan Catanase, Jack Herring, Clem Power
ESB, Ireland

10607 *A Multiconductor Approach To Study Power Flows In Asymmetric And Unbalanced Electric Distribution Networks*
Massimiliano Coppo, Roberto Turri, Alberto Cerretti, Massimo Bolognesi, Rosalba Russo, Giovanni Franzone
1: Università Padova; 2: Enel grids srl; 3: e-distribuzione spa

10630 *The Impacts Of Electric Vehicles And Photovoltaics On The Substations Of A Medium Sized Swedish City*
Mahmoud Shepero, David Lingfors, Joakim Widén, Joakim Munkhammar, Nicholas Etherden
1: Div. of Civil Engineering and Built Environment, Uppsala University, Sweden; 2: Vattenfall AB

10636 *Network Reconfiguration Under a Stochastic Optimisation Framework for Day-Ahead Operation Planning for Future Distribution Networks*
Gregorio Higuera, Behzad Kazemtabrizi
Durham University, United Kingdom

10651 *Data Driven Photovoltaic Regionalization Approach for Distribution System Operator Supply Areas*
Paul Zehetbauer, Clemens Korner, Thomas Wieland, Stephan Brandl, Maximilian Ortner
1: AIT Austrian Institute of Technology GmbH, Austria; 2: Netz Oberösterreich GmbH, Austria; 3: KNG - Kärnten Netz GmbH, Austria; 4: TINETZ - Tiroler Netze GmbH, Austria

10657 *Investment Planning For Electrification Of Transport In An Industrial Port*
Farhan Farrukh, Ciara Dunks, Per Olav Dypvik, Heidi S. Nygård
1: Smart Innovation Norway; 2: Reiner Lemoine Institut; 3: Borg Havn IKS, 4: NMBU, Norway

10669 *Integration of Environmental and Economical Impacts of Electricity Consumption in an Energy Community Based on Coalition Game.*
Adrien Bossu, Benoit Durillon, Arnaud Davigny, Hervé Barry, Sabine Kazmierczak, Benoît Robyns, Fateh Belaïd, Christophe Saudemont
1: Univ. Lille, Arts et Metiers Institute of Technology, Centrale Lille, Junia,ULR 2697–L2EP, F-59000 Lille, France; 2: Lille Catholic Institut (ICL), FGES, Faculty of Business, Economics, and Sciences,59000 Lille, France; 3: Faculty of Management, Econo

10692 *Decision Support for Matching Flexibility Measures to Flexibility Needs in Power System Planning*
Stian Nessa, Kasper Emil Thorvaldsen, Susanne Sandell, Hanne Sæle, Maren Istad, Edda Abelvik-Engmark, Marianne Blikø
1: SINTEF Energy Research, Norway; 2: Kongsberg Digital, Norway

10695 *How To Ensure Interoperability In Demand Response Systems: The Examples Of The European Projects H2020 GIFT And MAESHA*
Dune Sebilleau, Marjolaine Farré, Olivier Genest
Trialog, France

10698 *Analysis of Stochastic Load Behaviors on Fast Charging Stations Operational Planning and Business Model*
Leonardo N. F Silva, Alzenira R. Abaide, Jordan P. Sausen, Joelson L. Paixão, Ilana F. Santos
1: Federal University of Santa Maria, Brazil; 2: Equatorial Energia

10704 *Discharge Depth Control as a Solution for the Economic Viability of Vehicle-to-Grid Technology*
Dušan Popović
WSP, Serbia

10707 *P2P Trading of RTPV Energy on Blockchain Platform*
Reji Kumar Pillai, Reena Suri, Parul S
India Smart Grid Forum, India

10714 *How Can Flexibility Support Power Grid Resilience Through The Next Level Of Flexibility And Alternative Grid Developments*
Santiago Gallego Amores, Emil Hillberg, Antonio Iliceto, Ewa Mataczyńska, Albana Ilo
1: i-DE, Redes Eléctricas Inteligentes (Iberdrola), Spain; 2: ETIP SNET; 3: RISE Research Institutes of Sweden; 4: Institute for Energy Policy, Poland; 5: TU Wien, Austria

10721 *The Use of Distributed Energy Resources to Mitigate the Negative Imbalance Between Bulk Purchase Versus Distribution Tariffs in South Africa*
Aiden Kyle Rhode, Bernard Bekker, Christo Nicholls
Stellenbosch University, South Africa

10737 *Analysis Of The Renewable Energy Sources Generation Simultaneity In Croatia And The Impact On The Network Management*
Minea Skok, Lahorko Wagmann, Mario Maricevic
1: EIHP, Croatia; 2: HERA, Croatia

10739 *Quantifying Resiliency Benefits of Networked Microgrids using PowerModelsONM.jl*
David Fobes, Russell Bent, Rishabh Jain, Francisco Flores-Espino, Annabelle Pratt, Ryan Mahoney, George Walker, David Pinney, Trupal Patel, Matt Reno
1: Los Alamos National Lab, United States of America; 2: National Renewable Energy Lab, United States of America; 3: National Rural Electric Cooperative Association, United States of America; 4: Sandia National Lab, United States of America

10746 *Validation of Gaussian Mixture LV Load Models using Measurements*
Anton Ishchenko, Sai Suprabhath Nibhanupudi, Colin Willemsen
Phase to Phase B.V., The Netherlands

10753 *Smart Recharging Infrastructure for Companies' EV Fleets: Technical Realization and Load Balancing Potential*
Andrea Cazzaniga, Giuseppe Mauri, Filippo Colzi
RSE, Italy

10755 *Generic Technology Models To Simulate Flexible Operation In Multi-Energy Cellular Energy Systems*
Sasan Jacob Rasti, Hendrik Kramer, Felix Flatter, Peter Schegner, Weber Christoph, Goetz Stefan
1: TU Dresden, Germany; 2: University of Duisburg-Essen, Germany; 3: University of Kaiserslautern-Landau, Germany

10762 *Assessing The Impact Of Uncertainties Impact On The Techno-economic Performance Of Microgrids*
Elsy El Sayegh, Benoît Jacquet, Julien Bruschi, Sarah Nasr, Nabil Sadou, Pierre Haessig, Hervé Gueguen
1: EDF R&D, France; 2: CentraleSupélec, IETR, France

10764 *Towards the Optimisation of a DC Nanogrid Considering Technical and Environmental Criteria*
Colette Garron, Delphine Riu, Nicolas Chaintreuil
1: Univ. Grenoble Alpes, CEA, Liten, Campus Ines, 73375 Le Bourget du Lac, France; 2: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, F-38000 Grenoble, France; 3: French Environment and Energy Management Agency 20, avenue du Grésillé- BP 90406 49004 Ang

10765 *Low Carbon Customers: Analysis of Loading of Domestic Electric Vehicle and Heat Pump Transformers in Ireland*
Jack Herring, Clem Power, Tara Ní Reachtagain, Francisco Romo, Dan Catanase, Padraig Coughlan, Emma Silke
ESB, Ireland

10766 *Distribution Network Spare Capacity Unlocking Strategy (scus) to Integrate Heterogeneous Flexibilities*
Jianwei Li, Shuang Cheng, Melissa Mitchell, Furong Li
University of Bath, United Kingdom

10768 *Minimizing The Impacts Of EV Chargers On The Power Grid Thanks To An Optimizing Tool*
Quentin Morel, Sena Soysal, Julie Tisserand, Karima Boukir
1: EDF, United States of America; 2: EDF, Paris Saclay; 3: Enedis, Paris

10789 *Self-sufficiency and Lifetime Improvement of Community BESS on an LVDC Backbone Compared to Individual BESS*
Hakim Azaioud, Robbert Claeys, Jos Knockaert, Lieven Vandevelde, Jan Desmet
1: EELab/Lemcko, Ghent University, Belgium; 2: EELab, Ghent University, Belgium; 3: Corelab MIRO, Flanders Make

10790 *The Impact of COVID-19 on Electricity Demand in Portugal*
Joana Teixeira, Inês Ferrão, Sérgio Gonçalves, Anderson Soares, Nuno Lourenço, António Rua
1: E-REDES, Portugal; 2: Banco de Portugal, Portugal

10794 *Towards Resilient Electricity Distribution Systems in Africa*
Florian Sparavier, Céline Ramstein, Sébastien Leyder
1: Engie Impact, Belgium; 2: World Bank, USA

10800 *Autocalibration of a Bottom-up Methodology for Long Term Electricity Consumption Forecasting*
Kevin Bellinguer, Benjamin Grept, Antoine Chevalier, Robin Girard, Alexis Bocquet
1: Mines Paris – PSL University; 2: ENEDIS

10821 *Deployment Of Forecasting Tools In Diverse Demonstration Areas To Improve Energy Scheduling Of Microgrids*
Ana Turk, George Sideratos, Kamini Shahare, Aysegül Kahraman, Alexandros Paspatis, Guangya Yang, Arghya Mitra, Dipanshu Naware, Panos Kotsampopoulos
1: Technical University of Denmark, Denmark; 2: National Technical University of Athens; 3: Visvesvaraya National Institute of Technology

10827 *Experiences With Ampacity Rating Calculations For Wind Farm Export Cable*
Henrik Strand, Espen Eberg, Nina Marie Thomsen, Kristian Thinn Solheim, Kim Ove Asklund
1: SINTEF Energy Research, Norway; 2: Elvia, Norway

10828 *The Portuguese DAR(Distribution Automation Roadmap) Toward a More Demanding Electricity Grid*
José Gonçalves, Pedro Miguel, Luís Pires, Romeu Vitorino
1: E-REDES, Portugal; 2: INESC Coimbra, Portugal; 3: IPleiria, Portugal

10833 *Optimised Approach to Grid Development under Consideration of Digital Solutions*
Daniel Schacht, Christoph Schönhofen, Patrick Niewerth, Rainer Bäsmann
1: FGH GmbH, Germany; 2: N-ERGIE Netz GmbH, Germany

10835 *A Prediction Tool To Evaluate EV Charging Demand Based On Socio-Demographic Indicators*
Marc Cañigueral, Joaquim Meléndez
University of Girona, Spain

10836 *Data-driven Techniques to Improve the Reliability of Low Voltage Electricity Networks Through Dynamical Evaluation of Non-technical Losses*
Marc Girona-Badia, Gerard Mor, Gerard Laguna, Jordi Cipriano, Alvaro Luna
1: Centre Internacional de Mètodes Numèrics en Enginyeria(CIMNE), Spain; 2: Universitat Politècnica de Catalunya(UPC),Spain

10837 *Sizing Of A Power Electronics-Based Voltage Regulating Device To Support The Integration Of Photovoltaics And Electric Vehicles In LV Grids*
Sabine Vieira Reinert Frello, Victor Lavaud, Romain Trimbur, David Frey, Marie-Cecile Alvarez-Herault, Yvon Besanger, Nouredine Hadjsaid, Michel Cordonnier, Guillaume Langlet, Leonard Bacaud
1: University Grenoble Alpes, France; 2: Enedis

10845 *Probabilistic Impact Analysis Of Residential Batteries Providing FCR And aFRR On Low Voltage Grid*
Lionel Delchambre, Tom Carron, Patrick Hendrick, Hamada Almasalma, Pierre Henneaux, Abdramane Bathily
1: ULB, Belgium; 2: Sibelga, Belgium; 3: VITO, Belgium

10846 *FASIT, The Norwegian Reliability Data Collection System – Experiences And Utilitarian Values*
Arnt Ove Eggen, Jørn Heggset, Ketil Sagen, Camilla Aabakken, Bjørn Tore Hjartsjø, Egil Arne Østingsen, Svein Olav Gjerstad
1: SINTEF Energy Research, Norway; 2: Statnett SF, Norway; 3: Fornybar Norge, Norway; 4: The Norwegian Energy Regulatory Authority, Norway; 5: Lede AS, Norway; 6: Elmea AS, Norway; 7: Nettselskapet AS, Norway

10860 *Increasing Network Intelligence: Implementing Distributed Local Automation to Reduce Power Interruptions in Distribution Networks*
Aisan Rasouli, Christine Korssell, Yiming Wu, Anders Johnsson
1: Sweco Sverige AB; 2: Vattenfall Eldistribution AB, Sweden; 3: Vattenfall AB, Sweden

10873 *Low-Voltage Topology Identification from Incomplete Smart Meters Data : Spain Experiment*
Rémi Côme, Clémentine Benoit, Carlos Gaitan Poyatos, Santiago Cascante Nogales, Francisco Javier Leiva Rojo
1: Odit-e, France; 2: Enel, Spain

10874 *System Integration For Enhanced Network Planning And Operation With A Focus On Customer Interaction*
Walter Schaffer, Christoph Groiß, David Grubinger, Gerald Hörack, Sandra Renner
Salzburg Netz GmbH, Austria

10891 *Polygonal Optimisation Of Topologies For LV Network Schematics*
Alexander Angelov, Luke Hart, Diptargha Chakravorty
TNEI Services Ltd., United Kingdom

10906 *Impact of Electric vehicle charging on Italian LV distribution network*
Fabrizio Pilo, Giuditta Pisano, Simona Ruggeri
University of Cagliari, Italy

10908 *MV Network Maintenance Planning Decision Support Tool Considering Flexibility Of DER*
Bruna Tavares, Jorge Pereira, Clara Gouveia, Fábio Retorta, Rita Lopes Mourão, Miguel Louro
1: INESC TEC, Portugal; 2: E-REDES, Portugal

10921 *Leveraging Solar Energy Development To Achieve 100% Electrification Ratio In Nusa Tenggara Timur - Indonesia*
Daniel Tampubolon, Albertus Hendriyanto, Bellarminus Mari
PT PLN INDONESIA, Indonesia

10922 *Distribution Asset Thermal Ratings with Evolving Load Profiles*
Inalvis Fernandez Alvarez, Jouni Peppanen, Robert Sheridan, Timothy Raymond
Electric Power Research Institute, United States of America

10929 *Modeling PV Facility Side - Impacts and Recommendations*
Jouni Peppanen, Devin Van Zandt
Electric Power Research Institute, United States of America

10943 *Understanding the Effects of EV Management and TOU Tariffs on Customers and Distribution Networks*
Jing Zhu, William J. Nacmanson, Luis F. Ochoa
The University of Melbourne, Australia

10959 *Future Of Thermal Plants On Microgrids With High Renewable Share*
Matthieu Chiodetti, Thibaut Lafont, Hugo Gevret, Clément Huet, Pierre Mocellin
1: EDF R&D, France; 2: EDF SEI, France

10961 *Selection of Representative Urban Low-Voltage Grids for Electric Vehicle Integration Studies*
Simon Niederle, Simon Kreutmayr, Christoph J. Steinhart, Christian Gutzmann, Rolf Witzmann, Michael Finkel
1: Technical University of Munich, Germany; 2: Augsburg University of Applied Science, Germany; 3: SWM Infrasttruktur GmbH & Co. KG, Germany

10966 *Integration Of Flexibility Solutions In The Multi-year Planning Of Distribution Grids With Large Amounts Of Renewable Energy Sources: Development Of A Decision-support Tool For The DSO*
Amine El makhroubi, Héloïse Baraffe, Juliette Morin, Mathieu Rainot, Juliette Chatel
1: EDF R&D, France; 2: Enedis, France

10975 *Digitized Complex Project Management*
Mario Fernandez, Valentina Loreto, Federico Pollachini, Juan Refoyo, Alessio Gentile, Germana Giannini, Giovanni Franzone, Francesco Amadei
1: ENEL GRIDS, Italy; 2: ENEL GRIDS, Spain

10976 *A Surrogate Model of Distribution Networks to support Transmission Network Planning*
Matteo Rossini, Marco Rossi, Dario Siface
Ricerca sul Sistema Energetico – RSE SpA, Italy

10984 *SILVERSMITH - An Investigation Into Low Voltage Network Management*
Thomas Stone, Sebastian Lindmark, Laurence Hunter
1: EA Technology, United Kingdom; 2: National Grid, United Kingdom

11001 *MVDC Distribution System Application Scenarios and Economic Analysis*
Hongjoo Kim, Jintae Cho, Youngpyo Cho, Hosung Ryu, Jiwon Kee, Juyong Kim
KEPCO/South Korea, South Korea

11005 *Challenges and Needs for High Power Combined Charging of Ferries and Electric Vehicles – A Norwegian Scenario Case Study*
Eirill Bachmann Mehammer, Venkatachalam Lakshmanan, Jonatan Ralf Axel Klemets, Andrè Gjørven, Bendik Nybakk Torsæter
1: SINTEF Energy Research, Norway; 2: Mellom AS, Norway

11006 *Hierarchical Large-Scale Distribution Grid Simulation Across Multiple Voltage Levels Using Smart Meter Data*
Nikolaos Efkarpidis, Stephan Koch, Damiano Toffanin, Patrick Lieberherr, Dominique Baudenbacher, Sudipta Saraswati
Secure Switzerland AG, Switzerland

11015 *A Climate Change Adaptation Action Plan For The Electricity Sector: E-REDES Experience*
Inês Gomes, Inês Silva, Paulo Alberto, Ricardo Prata, Carlos Lopes
E-REDES, Portugal

11016 *Operation And Planning Services For Active Distribution Networks – A BD4OPEM Project Use Case: Spanish Pilot*
Alejandro Hernandez-Matheus, Antonio Emmanuel Saldaña González, Rafaela Ribeiro, Mònica Aragüés-Peñalba, Eduard Bullich-Massagué
CITEA - UPC, Spain

11025 *A New Optimization Method Brings Distribution Grids Performance To The Next Level Thanks To Digital Transformation*
Thi Thu Ha Pham, Jerome Brun, Julien Mecreant, Nicolas Choulet
Schneider Electric, France

11026 *A Study of Mid to Long-term Distribution Planning Based on PV Installation Forecasting*
Jintae Cho, Hongjoo Kim, Hosung Ryu, Jiwon Lee, Juyong Kim, Yongju Son, Sungyun Choi
1: KEPCO, South Korea; 2: Korea University, South Korea

11030 *Distribution Planning Tool using Flexible Strategies: Case Study in Spanish Pilot*
Antonio Saldana-González, Mónica Aragüés-Peñalba, Andreas Sumper, Ramón Gallart-Fernández, Lluís Cànaves-Navarro
1: Universidad Politécnica de Cataluña, Spain; 2: Estabanell Distribució, Spain

11043 *MVDC Grids to Facilitate the Roll out of Renewables – Findings of CIRED-WG 2021-1*
Stephan Rupp, Sebastian Brüske, Graeme Burt, Agusti Egea-Àlvarez, Uwe Schichler, Gerhard Jambrich
1: Maschinenfabrik Reinhausen, Germany; 2: University of Strathclyde, UK; 3: Technical University Graz; Austria; 4: AIT Austrian Institute of Technology GmbH, Austria

11048 *Dimensioning And Sizing Of An Energy Storage For Ports When Considering Both Fast And Slow Load Variations*
Jonatan Ralf Axel Klemets, Kyrre Kirkbakk Fjær, Jens Eirik Hagen, Eirill Bachmann Mehammer, Henrik Strand
1: SINTEF Energy Research, Norway; 2: Port of Oslo, Norway

11054 *Hosting Capacity Using Real Time-Series for PV, EV, Load and Background Voltage*
Taís Tavares de Oliveira, Nicholas Etherden
1: Luleå University of Technology, Sweden; 2: Vattenfall R&D, Sweden

11066 *Methods and Future Scenarios for Strategic Grid Development of Full Low and Medium Voltage DSO Supply Areas*
Helfried Brunner, Clemens Korner, Thomas Wieland, Stephan Brandl, Maximilian Ortner
1: AIT Austrian Institute of Technology; 2: Netz Oberösterreich GmbH; 3: KNG Kärnten Netz GmbH; 4: TINETZ Tiroler Netze GmbH

11069 *Large-Scale Grid Investment Strategy In Low-Voltage Networks*
Jur Erbrink, Peter van Oirsouw, Johan Kroeze, Bart Pluijms, Lars Hoefnagel, Atze Peters
Alliander, The Netherlands

11076 *Machine Learning-based Identification and Mitigation of Vulnerabilities in Distribution Systems against Natural Hazards*
Balaji V Venkatasubramanian, Mohamed Lotfi, Pierluigi Mancarella, André Águas, Mohammad Javadi, Leonel Carvalho, Clara Gouveia, Mathaios Panteli
1: University of Cyprus, Cyprus; 2: University of Manchester, UK; 3: E-REDES, Portugal; 4: INESC TEC, Portugal

11082 *A Planning Toolkit to Evaluate Shore-side Infrastructure Requirements for Electrified Water-based Transportation*
Lewis Hunter, Stuart Galloway
University of Strathclyde, Glasgow, Scotland

11101 *Post-Covid Customer Service Behavior Forecasting Using Machine Learning Techniques*
Leonardo do Nascimento Pereira, Vitor Augusto de Freitas Silva, Marcella Manconi Shimizu, Jorge Gabriel Rodrigues da Cruz
CPFL Energia, Brazil

11123 *Anticipating Aggregated Demand From Charging EV In Collective Car Park With A Multi-Agent System*
Ilyes Kabbourim, Remi Driat, Giovanni Mattarolo, Somsakun Maneerat, Ghislain Agoua, Jérôme Cantenot, Ricardo Jover, Clément Christophe, Benoît Grossin
1: Enedis, France; 2: EDF R&D, France

11133 *Optimal Scheduling of Energy Storage System in Distribution Grids Using Service Stacking*
Johannes Hjalmarsson, Alexander Wallberg, Carl Flygare, Cecilia Boström, Fredrik Carlsson
1: Uppsala University, Sweden; 2: Vattenfall R&D, Sweden

11143 *Study of Low-voltage Distribution Grid Connection Dimensioning Principles Considering Distributed Generation in Finland*
Jouni Haapaniemi, Otto Räisänen, Antti Supponen, Juha Haakana, Julius Vilppo, Jukka Lassila, Sami Repo
1: Lappeenranta-Lahti University of Technology LUT, Finland; 2: Tampere University, Finland

11161 *Impact of EV Regionalisation on Network Reinforcement Requirements*
Barbara Herndler, Roman Schwalbe, Clemens Korner, Tobias Riedlinger, Thomas Wieland, Stephan Brandl, Maximilian Ortner
1: AIT Austrian Institute of Technology, Austria; 2: University of Wuppertal; 3: Netz Oberösterreich GmbH; 4: KNG - Kärnten Netz GmbH; 5: TINETZ - Tiroler Netze GmbH

11162 *Regionalised Approach to Heat Pump Allocations and its Impact On LV Network Reinforcement Requirements*
Barbara Herndler, Roman Schwalbe, Clemens Korner, Thomas Wieland, Stephan Brandl, Maximilian Ortner
1: Austrian Institute of Technology, Austria; 2: Netz Oberösterreich GmbH; 3: KNG - Kärnten Netz GmbH; 4: TINETZ - Tiroler Netze

11165 *Integration of a Multi-megawatt Charging Station in the Medium Voltage Network*
Barbara Herndler, Cham Kpu Gerald, Yannick Wimmer
Austrian Institute of Technology, Austria

11183 *Electric Vehicle Charging Measurements in the Nordic Environment – Charging Profile Dependence on Ambient Temperature*
Ville Tikka, Otto Räisänen, Jouni Haapaniemi, Gonçalo Mendes, Jukka Lassila, Samuli Honkapuro
LUT University, Finland

11188 *Forecasting For Electricity Grid Planning: Current Challenges And Future Improvements*
Age Van Der Mei, Elias Hartvigsson, Balint Hartman, Ricardo Pastor, Daphne Geelen, Jan-Peter Doomernik
1: Duinn, The Netherlands; 2: Endre, Sweden; 3: Budapest University of Technology and Economics, Hungary; 4: Enexis DSO, The Netherlands; 5: R&D NESTER, Portugal

11202 *AI Supported Analysis Of Faults Caused By Atmospheric Exposures In Medium and Low Voltage Grids For Evaluation And Development Of Asset Management Strategies*
Sebastian Storch, Martin Uhrig, Michael Finkel
1: Augsburg University of Applied Sciences, Germany; 2: LEW Verteilnetz GmbH

11220 *Load Scheduling and V2G to Minimize Power Demand – Exploring Potential for Airport Parking Facility, Norway.*
Thomas Martinsen, Georg Devik, Heidi S Nygård
Norwegian University of Life Sciences, Norway

11231 *The Benefits Of Smart4RES Predictive Analytics*
Catarina Martins, Maria Inês Marques, Ricardo Bessa, Ferinar Moaidi, Simon Camal
1: EDP NEW, Portugal; 2: INESC TEC, Portugal; 3: MINES Paris – PSL University, France

11241 *Meteorological Benchmark Forecasts for Energy Management Systems*
Michael Spiegel, Thomas Strasser
1: AIT Austrian Institute of Technology, Austria; 2: Technische Universität Wien (TU Wien), Austria

11250 *Experience In The Implementation Of Isolated Electrical Energy Generation Systems From Renewable Energy Sources- Solar Villages*
Miguel Quispe Reyes, Daniel Alejandro Nieto Lépez, Martin Lamas, Rodrigo Ces Gomez
EJE SA, Argentine Republic

11266 *Load Demand and Grid Integration of Electric Ferries: A Case Study in the Three Major Italian Lakes*
Massimo Ceraolo, Giovanni Lutzemberger, Giuseppe Mauri, Paolo Mazzucchelli, Sara Salamone
1: RSE S.p.A., Italy; 2: University of Pisa; 3: Gestione Governativa Navigazione Laghi

11273 *Domestic Demand Shift Trial for Local Network Management and Distributed Generation Curtailment Avoidance*
Kailash Singh, Russell Bryans, Malcolm Bebbington, Guy Shapland, Gerard Boyd, Wendy Mantle, Kieron Stopforth, Simona Burchill
1: Scottish Power Energy Networks, United Kingdom; 2: Octopus Energy, United Kingdom

11279 *Identification of a Causal Weather-QoS Model for Analysis and Planning of Distribution Networks*
Letizia Ambrosetti, Alessandro Perina, Francesco Adinolfi, Carlo Laderchi, Gabriele Licasale, Alessio Montone
Enel Grids, Italy

11302 *Integrated Physical And Probabilistic Modelling Of Low Voltage Cable Temperatures, Stress Cycles, And Damage*
Gordon McFadzean, Megan Taylor, Zoe Hodgins, Gruffudd Edwards, Nicole Lee, Rosemary Tawn, Ben Ingham
1: TNEI Services Ltd, United Kingdom; 2: Frazer-Nash Consultancy, United Kingdom; 3: Electricity North West Ltd, United Kingdom

11305 *Phase Identification using Smart Meter Data*
Andrew Urquhart, Iro Psarra, Alex Gardner, Jenny Woodruff, Nadim Al-Hariri, Murray Thomson
1: Loughborough University; 2: CGI; 3: National Grid Electricity Distribution

11329 *Predicting Local Effects of Energy Transition Through Development of a Network Observation Tool*
Julien Vandeburie, Thomas Wehenkel, Simon Gerard
RESA, Belgium

11345 *IANOS Project: Integrated Solutions to Decarbonise and Improve the Resilience of Electrical Power and Energy Systems in Geographical Islands*
Eduardo Ruano Rodrigues, Ana Carvalho, Carlos Martins
1: EDP; 2: EDA

11356 *Overhead Lines and Underground Cables Asset Management – Best Practices and Challenges*
Ricardo Prata, Martin Podlogar, Patrick Zander, Odilon Faivre, Anne-Soizic Ranchere, Masoud Davoudi
1: E-REDES, Portugal; 2: Elektro Ljubljana, Slovenia; 3: PG&E, USA; 4: Omicron, Germany; 5: Enedis, France; 6: Nexans, France

11391 *Contributions to Energy Management of Single-Phase AC Microgrids Used in Isolated Communities*.
Aziz Oloroun-Shola Bissiriou, Ricardo L. of A. Ribeiro, Thiago de O. A. Rocha
Universidade Federal do Rio Grande do Norte, Brazil

11405 *Systematic Application of Series Compensation in Distribution Networks with Control and Protection*
Cíntia Veiga Claudio, Guilherme Ferretti Rissi, Carlos Eduardo Cauduro Figueiredo, Luis M. Duarte, Nelson Clodoaldo de Jesus, Willian Souza de Jesus, Seun Ahn, Massayuki Suzuki, Mateus Teixeira Duarte, Flávio R. Garcia, Patrick R. Almeida, João R. Cogo
1: CPFL ENERGIA; 2: GSI - Engenharia e Consultoria Ltda; 3: APPITEC; 4: UFPR; 5: Bree

11406 *Integrated Method for Distribution Grid Expansion Planning Considering Operational Strategies of Residential Technologies*
Luis Böttcher, Klemens Schumann, Arthur Pereira Novaes, Andreas Ulbig
1: IAEW at RWTH Aachen University, Germany; 2: Fraunhofer Center Digital Energy

11413 *Optimal Planning of University Campus Microgrid with High Penetration of Renewable Energy and Storage: UCCS Campus Case Study*
Tarek Masaud, David Michon, Emmanuel Nwaulu
University of Colorado at Colorado Springs, United States of America

11425 *Distribution Planning Model Requirements for Smart Community Integration*
Mark McGranaghan, Treisa Ravi Sahaya, Jouni Peppanen
1: EPRI Europe, Ireland; 2: University College Dublin, Ireland; 3: EPRI, USA

11427 *Support Vector Machine For Classification Of Households' Heating Type Using Load Curves*
Kristoffer Fürst, Peiyuan Chen, Irene Yu-Hua Gu
Chalmers University of Technology

11428 *Smart Charging of Electric Vehicles Based on Scheduling Theory*
Heidi S. Nygård, Ingrid Maria Mørch, Olvar Bergland
NMBU, Norway

11443 *Enel Grid+: the Advanced Platform for Network Analysis and Planning*
Gabriele Licasale, Raffaele Scarantino, Francesco Viapiana, Andrea Vermigli, Massimiliano Alloni, Pierluigi Bianchi, Giulia Ravarino
1: Enel Grids; 2: Enel Grids, Italy

11445 *Coordinated Deployment Of Electric Taxi Minibuses To Enhance Solar Photovoltaic Hosting Capacity Of Residential Networks*
Lewis Waswa, Justice Munyaradzi Chihota, Bernard Bekker
Stellenbosch University

11456 *Effects Of Demand Side Management Programs in Modern Distribution Planning – Challenges and Opportunities*
Davis Montenegro, Alison O'Connell, Jason Taylor
EPRI, United States of America

11457 *Measuring the Power Grid Resilience: A Case Study Applied to Brazilian Distribution Companies*
Joisa Dutra, Lucas Amaro, Rafael Souza, Henrique Ennes, Camila Albertin, Rafael Gomes
1: Fundação Getulio Vargas; 2: Grupo CPFL Energia

11462 *Distribution System Planning with models of flexibility markets*
Gianni Celli, Marco Galici, Fabrizio Pilo
University of Cagliari, Italy

11481 *The Impact Of Forecasting Accuracy On The Economic Performance of Flexibility Provision*
Gary Howorth, Ivana Kockar, Paul Tuohy, Graeme Flett, John Bingham
1: University of Strathclyde, United Kingdom; 2: Engineering Technology Centre Ltd (ETC), United Kingdom

11484 *Efficiency Comparison of Programmed SAID in Investments in the Distribution System*
Taric Saldanha, Diogo Boff, Ingrid Kirsch, Rodrigo Figueiredo, Paulo Pereira, Lucas Chiara
UNISINOS, Brazil

11491 *Hosting Capacity Portal of All Voltages Levels*
Renan Machado Sales, Daniel Szente Fonseca, Marcelo Aparecido Pelegrini, Gustavo Travassos Aguiar da Silva, José Antônio de Souza Brito
1: Sinapsis Inovação em Energia, Brazil; 2: Neoenergia S.A.

11493 *Model for Determining the Charging Time of Electric Vehicles in Fast Charging Stations*

Caroline Beatriz Fucks Darui, Alzenira da Rosa Abaide, Matheus Souza da Cruz, Nelson Knak Neto, Tiago Guterres Lucca, Leonardo Silva

1: Universidade Federal de Santa Maria, Brazil; 2: Universidade Regional Integrada do Alto Uruguai e das Missões - URI campus Santo Ângelo, Brazil

11501 *Flexible Methodology for Battery Swapping Stations Planning Operation in Support of Distribution Grids*

Héricles Eduardo Oliveira Farias, Camilo Alberto Sepulveda Rangel, Luciane Neves Canha, Bernardo Ziquinatti Franciscatto, Henrique Klein, Victor Santos Martins Gomes

1: FEDERAL UNIVERSITY OF SANTA MARIA, Brazil; 2: Energy2Go

Session 6 : Customers, Regulation, DSO Business & Risk Management

10112 *Challenges And Opportunities When E-Mobility Is Incorporated In Argentinian Scenarios*
Darío Slaifstein, Fernando Nicchi
Universidad de Buenos Aires, Argentine Republic

10113 *Incentive Regulation For Lower Losses And More Efficient Use Of The Grid When Random Photovoltaic DG Is Connected In Argentinian LV Networks*
Alejandro Jurado, Edgardo Vinson, Fernando Nicchi
Universidad de Buenos Aires, Argentine Republic

10117 *Pilot Project where a Battery Energy Storage System is used for Fast Frequency Reserve*
Hanne Sæle, Maren Istad, Signe Marie Oland
1: SINTEF Energi AS, Norway; 2: Lede AS, Norway

10122 *Assessment Of The Significance Of Features For The Identification Of Domestic Appliance*
Liya Ma, Maximilian Schmidt, Peter Schegner
Technische Universitaet Dresden, Institute of Electrical Power Systems and High Voltage Engineering, Faculty of Electrical and Computer Engineering

10136 *The Use Of Virtual Reality In The Training Of Employees In Electricity Distribution Companies*
Amir Navidi, Ali Mighi, Masoud Ghasemi
Tehran Electric Power Distribution Company, Iran

10138 *EleniaGO – Crowdsourcing Maintenance Inspections*
Harri Salomäki, Pauliina Salovaara, Heikki Malkamäki
1: Elenia Verkko Oyj; 2: Ambientia Oy

10143 *Advanced Electrical Energy Storage Technologies And Their Applications On Customer Side*
Christian Noce, Luigi Lanuzza, Martina Radicioni
Enel X SrL, Italy

10154 *Potential of a Decentralized Load Management Concept and Transferability to Various Countries*
Sonja Baumgartner, Veronika Barta, Stephanie Uhrig, Rolf Witzmann
1: LEW Verteilnetz GmbH, Germany; 2: HM University of Applied Sciences Munich; 3: TUM Technical University of Munich

10162 *A New Customer-Oriented Approach For Residential Demand-Side Flexibility: The Case Of The Zeeland Region In The Netherlands*
Fabien Berger
FRACTAL ENERGY, France

10185 *Risk Management to avoid the Safety accidents*
Yu Jung An, Young Ik Lee, Dong Min Kim, Ju Hyuk Im
kepco, South Korea

10205 *Electrification Technologies And Grid Services Testing Inside Enel X Labs*
Christian Noce, Luigi Lanuzza, Massimiliano Maurizio De Benedetti
Enel X SrL, Italy

10215 *Real Time Quality Monitoring Of Electrical Distribution Network Affected By Heatwaves: A Data-oriented Approach*
Giulia Muscarà, Gianluca Di Felice, Francesco Paolo Palazzotto, Roberto Brandi, Niccolò Corsi, Massimo Pompili, Luigi Calcara
1: e-distribuzione, Italy; 2: University of Rome La Sapienza, Italy

10217 *Towards the digital transformation of Distribution System Operators using Knowledge Graphs and Conversational AI*
Ioan Toma, Juergen Umbrich, Sonja Laengle, Marc Isop, Martina Theil, Alexander Sas, Werner Horst Reinwald, Andreas Theil, Alexander Wahler, Umutcan Simsek, Dieter Fensel
1: Onlim Gmbh, Austria; 2: Wiener Netze GmbH, Austria; 3: University of Innsbruck, Austria

10228 *Assessment and Visualisation of Extreme Weather Impacts and Climate Change Risks on Distribution Network Operation*
Lizaveta Troshka
National Grid, United Kingdom

10230 *Viable LINK-based Energy Community: Increasing Flexibility and Resilience of Electricity Infrastructure*
Helmut Bruckner, Albana Ilo, Markus Olofsgard, Marketa Adamcova
1: Sonnenplatz Großschönau GmbH, Austria; 2: Technical University Vienna, Austria; 3: AFRY AB, Sweden; 4: LEEF Technologies s.r.o., Czech Republic

10233 *Method for Determining the Impact of Local Energy Markets on the Distribution Grid Expansion*
Klemens Schumann, Luis Böttcher, Simon Braun, Andreas Ulbig
1: IAEW at RWTH Aachen University; 2: Fraunhofer FIT, Aachen, Germany

10236 *End-use Sector Coupling To Turn Customer Plants Into Prosumers Of Electricity And Gas*
Andrea Ademollo, Albana Ilo, Carlo Carcasci
1: University of Florence, Italy; 2: TU Wien, Austria

10240 *Model and Tariff Design for Multifunctional Distribution Networks*
Senad Aganovic, Elvisa Becirovic, Edina Aganovic
1: Regulatory commission for energy in Federation on Bosnia and Herzegovina; 2: Public Company "Elektroprivreda BiH" d.d. Sarajevo; 3: Independent System Operator in Bosnia and Herzegovina

10254 *Nation-wide Projection of Motivators and Consumer Willingness for Direct Load Control Demand Response in Finland*
Araavind Sridhar, Jan Stoklasa, Samuli Honkapuro, Fredy Ruiz, Salla Annala, Annika Wolff, Antti Rautiainen
1: LUT University, Finland; 2: Polytechnic University of Milan, Milan, Italy; 3: Pohjois-Karjalan Sähkö

10260 *Electric Energy Distribution – Control of NTL (Non Technical Losses)*
Miguel Pulice
Edenor, Argentine Republic

10267 *Anonymisation Score For Time Series Consumption Data*
Cecilia Gerlitz, Axel Eriksson, Camilla Hansson
1: Vattenfall AB, Sweden; 2: Vattenfall Eldistribution AB, Sweden

10268 *Swedish Approach For The Assessment And Monitoring Of The Smart Grid Development*
Maria Dalheim, Herlita Bobadilla Robles, Mohamadreza Baradar, Carl Johan Wallnerström
The Swedish Energy Markets Inspectorate, Sweden

10280 *Assessing Gender Equality in the Distribution Sector*
Sarah Ouziaux
ENGIE IMPACT - BRUXELLES, Belgium

10313 *Traceability of power generation in a Multi-Energy Virtual Power Plant using Blockchain*
João Tadeu Santos, Célio Bermann
1: SiDi; 2: University of São Paulo

10317 *Metrics for the Validation of Agent-Based Local Flexibility Markets*
Alexandra Karmann, Maximilian Kilthau, Jan-Philip Beck, Christian Derksen, Kamil Korotkiewicz, Martin Asman, Alexander Fay
1: Helmut Schmidt University / University of the Federal Armed Forces Hamburg; 2: University of Duisburg-Essen; 3: PSI GridConnect GmbH; 4: University of Wuppertal

10321 *Identification and Characterization of Inverters used for PV Generation and Storage Systems*
José Gonçalves, Eduardo Rodrigues, António Grilo, Pedro Carvalho, Nuno Creado, Hugo Morais
1: IST, Portugal; 2: INESC-ID, Portugal; 3: Smart Energy Lab

10323 *Optimal Strategies for the Management of Electric Power Distribution Systems Considering Diversified Age Structures of the Electrical Equipment and Their Economic and Technical Implications*
Robin Schubert, Markus Zdrallek
Institute of Power Systems Engineering, University of Wuppertal, Wuppertal, Germany

10340 *Estimation Of Impact Of Extreme Weather Conditions On Distribution Asset And Improvement Of Operational Procedures Supported By Evolved Tools*
Luigi D'Orazio, Roberto Calone, Gianluca Di Felice, Marina Bernardi
1: ENEL, Italy; 2: e-distribuzione, Italy; 3: CESI, Italy

10345 *On the Role of Industrial Kitchens in sustainable Energy Systems: The NexIK Vision*
Ana Oliveira, Miriam Ribeiro, Ricardo Martins, Gonçalo Morais, Hugo Morais, Lucas Pereira
1: IST Lisboa, Portugal; 2: INESC-ID, Portugal; 3: ITI, LARSyS, Técnico Lisboa – Portugal

10373 *Using Smart Meter Data to Predict and Identify Consumer Vulnerability*
Rob Wadsworth, Marnie Ellis, Lizaveta Troshka, Zoe Hodgins
1: National Grid; 2: Frazer-Nash Consultancy

10376 *The EUniversal Portuguese Demonstrator: From MV-LV Coordinated Identification Of Flexibility To Activation Through The UMEI*
Rita Lopes Mourão, Clara Gouveia, Gil Sampaio, André Águas, Christian Merckx, Féres Benothman, Gesa Milzer, Giancarlo Marzano, Mahtab Kaffash, Evelyn Heylen, Pedro Boto, Carlos Damas Silva, Chloé Dumont, Pierre Crucifix, Fábio Retorta
1: E-REDES, Portugal; 2: INESC TEC, Portugal; 3: ENGIE Impact, Belgium; 4: NODES, Norway; 5: N-SIDE, Belgium; 6: Centrica, Belgium

10384 *SIORD, a New DSO-shared Data Hub to Monitor and Control Distributed Energy Resources in Spain*
Daniel Davi-Arderius, Moises Canales Laso, Albert Estapé Vilà, David Martin Utrilla, Alberto Suárez Fontenla, Marta Viñas Gómez, Marta Castro Pérez-Chirinos
1: e-Distribución Redes Digitales, Spain; 2: Viesgo Distribución (Grupo EDP); 3: ASEME; 4: I-DE Redes Eléctricas Inteligentes, S.A.U.; 5: Unión Fenosa Distribución; 6: CIDE; 7: AELEC

10386 *Asset Owner Perspective on Managing Growth and Reinvestment Needs*
Markus Taaveniku, Marcus Halvarsson, Matthias Hopfensitz, Heiko Spitzer
1: Vattenfall Eldistribution AB, Sweden; 2: entellgenio GmbH, Germany

10388 *The Interest of Energy Communities in Urban Areas – from a DSO's Perspective*
Daphné Benzennou, Odile Macé, Daniel Raes
Sibelga, Belgium

10391 *Relax Regulation and Market Frames to Increase Sector Coupling*
Edoardo Corsetti
RSE, Italy

10393 *The UMEI - Universal Market Enabling Interface. Enabling Standard Interaction with Various Flexibility Markets to Procure Grid Services*
Carlos Damas Silva, Gesa Milzer, Arnaud Debray, Mahtab Kaffash, Narve Sætre, Chloé Dumont, Evelyn Heylen, Øystein Dyvik Eide, Giancarlo Marzano
1: E-REDES, Portugal; 2: N-SIDE, Belgium; 3: Centrica Business Solutions, Belgium; 4: NODES, Norway

10407 *Design of an Auction-based Local Energy Market for Integrated Electricity and Heat Networks Coordinated with Wholesale Market*
Sara Haghifam, Hannu Laaksonen, Miadreza Shafie-khah
Univesity of Vaasa, Finland

10411 *Public Consultation Platform for Network Development Plan*
Tiina Salmi, Harri Salomäki, Ilkka Luoma
1: Elenia Oy; 2: Elenia Verkko Oyj; 3: Vincit Oyj

10421 *Gamification an Innovative Approach to Reduce Electricity*
Hamid Haghjoo, Marzeh Zarehzadeh, Mehdi Ashkpourmotlagh
1: Hamid haghjoo, Iran; 2: Marzeh zareh zadeh ,Iran; 3: Mehdi ashkpour motlagh

10422 *Extreme Weather and Power Distribution System Resilience*
Mohammed Al Ghenaimi
Mazoon Electricity Company, Oman

10445 *Regulatory Learnings from EU Funded Flexibility Projects. The i-DE Case: Preparing the Future DSO.*
Santiago Gallego Amores, David Martín Utrilla, José Pablo Chávez Ávila, Beatriz Alonso Santos
1: i-DE, Redes Eléctricas Inteligentes, Spain; 2: IIT- Universidad Pontificia Comillas, Spain

10462 *Climatological Changes And New Applications For System Grid Operators*
Kerstin Weindl, Lukas Schwalt, Klemens Reich
1: Austrian Power Grid, Austria; 2: TU Graz, Austria

10465 *Real-Time Pricing Tariffs for Flexible Energy Storage Systems Considering the Market and Grid Conditions*
Oliver Koch, Christian Möller, Markus Zdrallek, Anders Timo
1: University of Wuppertal, Germany; 2: WSW Energie & Wasser AG

10482 *A Framework for Dynamic Risks and Resiliency Assessment of Critical Infrastructure a Case Study on Power Distribution Transformers*
Mohsen Farzadmehr, Mostafa Aliyari, Vahid Baghshani, Yonas Zewdu Ayele
1: KEDC Company; 2: Østfold University College, Norway; 3: IFE, Institute for Energy Technology

10487 *Multi Objective Optimization Of Flexibilities In Ski-Resorts – CO2, Power Peaks, And Day-Ahead Market*
Clemens Korner, Klara Maggauer, Branislav Iglar, Susanne Windischberger, Hannes Passegger, Norbert Dorfinger
1: AIT Austrian Institute of Technology; 2: World-Direct; 3: Salzburg AG

10495 *An Assessment Of The GB Energy Market's Suitability For Delivering A Customer-Focused Net-Zero*
Laurence Hunter, Yiango Mavrocostanti, Helena Tauber, Ann Zhang, Alex Whittaker, Sarah Deasley
1: National Grid, United Kingdom; 2: Frontier Economics, United Kingdom

10497 *Vehicle-to-Home or Battery Energy Storage Systems – A Comparison of the Potential Usage in Smart Homes*
Charlotte Wagner, Kathrin Walz, Krzysztof Rudion, Dario Burghof, Ingo Mauser
1: Institute of Power Transmission and High Voltage Technology (IEH), University of Stuttgart, Germany; 2: SENEC GmbH

10499 *Technical And Economic Grid Reinforcement Analysis For The Danish DSO Networks*
Jasmin Mehmedalic, Peter Kjær Hansen
Green Power Denmark, Denmark

10500 *Resilience of the Energy System to Climate Change*
Perrin Nicolas, Drobinski Philippe, Roche Nicolas
1: Enedis, France; 2: LMD - Laboratoire de Météorologie Dynamique, France

10514 *Central Monitoring Application used at Brno University of Technology*
Tomáš Bajánek, Viktor Jurák, Jaroslava Orságová, Lubomír Novák
1: ABB, Czech Republic; 2: Brno University of Technology, Czech Republic

10522 *Non-firm Grid Connections For Low-Voltage Generators: A Case Study*
Louise Muller, Florent Cadoux
Roseau Technologies, France

10560 *Smart Meters Technology Intervention - benefits to Consumers and Utility*
Ruman Maknojia, Shriram Savarkar, Devanjan Dey, Vishal Agrawal
Tata Power Mumbai Distribution, India

10569 *Privacy by Design in Local Electricity Markets: A Differentially Private Market Mechanism*
Milad Hoseinpour, Mahmoud-Reza Haghifam
Tarbiat Modares University, Iran

10572 *Tariff Development for Smart EV Charging for Households*
Denis Yeboah, Esa Äärynen, Pirjo Heine, Mahdi Pourakbari
1: Helen Electricity Network Ltd., Finland; 2: Aalto University, Finland

10576 *Volumetric Or Capacity-based Grid Tariffs: A Case Study For Residential Consumers In Flanders*
Robbert Claeys, Rémy Cleenwerck, Jos Knockaert, Jan Desmet
1: Ghent University, Belgium; 2: Vrije Universiteit Brussel, Belgium

10589 *Reducing Power Peaks In Low-Voltage Grids Via Dynamic Tariffs And Automatic Load Control*
Katharina Kaiser, Markus Kreft, Eleni Stai, Marina González Vayá, Thorsten Staake, Gabriela Hug
1: ETH Zurich, Switzerland; 2: Elektrizitätswerke des Kantons Zürich (EKZ), Switzerland

10601 *New Tool To Improve The Grids Status Monitoring And Customer Connections Process*
Rosalba Russo, Francesco Amadei, Giovanni Franzone, Luciano Cocchi, Massimo Bolognesi, Alberto Cerretti
1: Enel grids srl; 2: e-ditribuzione spa

10609 *Coordination of Community Electricity Markets and Distribution Network Operation*
Irena Dukovska, J.G.{Han} Slootweg, Nikolaos G. Paterakis
1: Eindhoven University of Technology, The Netherlands; 2: Enexis B.V.

10613 *Flexibility Settlement For Congestion Management: Two Practical Studies*
Alain Stuivenvolt, Rik Fonteijn, Hadis Pourasghar Khomami, Han Slootweg
1: Enexis, The Netherlands; 2: Eindhoven University of Technology, The Netherlands

10625 *Quantitative Approach of A Novel Disaster- Based Vulnerability Index in Distribution System By Utilizing Geographical Information System Study Case in Palu After Disaster*
Very Fernando, Revi Aldrian, M.Soffin Hadi, Yohanes Sukrislismono, Indratno Pardiansyah
PT PLN (Persero), Indonesia

10629 *Reactive Power Flows From Mv To Hv Grids*
Mauro De Masi, Andrea Vincenzo Calamera, Giovanni Valtorta, Sergio Severa, Giulio Lenaz
1: e-distribuzione, Italy; 2: enel, Italy

10653 *Business, Regulatory, and Technical Challenges for Integration of Network Aware Algorithms in Local Flexibility Markets*
Pau Plana i Ollé, Farhan Farrukh, Andrea Mazza, Heidi S. Nygård
1: Smart Innovation Norway, Norway; 2: Politecnico di Torino; 3: NMBU, Norway

10673 *Renewable Energy Data Platform Including Electric Power Transmission and Distribution System*
SungHo Park, Jaein Kim, Simin Sung, JooYoung Moon
KEPCO (Korea Electric Power Corporation), South Korea

10681 *Study of Electrical Consumption Flexibility Offered by HVAC System Based on Rooms Thermal Modelling - Tertiary Building Case Study*
Mhamad Shmaysani, Khaled Almaksour, Benoit Durillon, Christophe Saudemont
Univ. Lille, Arts et Metiers Institute of Technology, Centrale Lille, Junia, ULR 2697 - L2EP, F-59000 Lille, France

10682 *Business Case of DSO Peak Shaving to Reduce Capacity Payments to Upstream Network Operators*
Pau Plana i Ollé, Farhan Farrukh, Malte Thoma, Gesa Milzer, Heidi S. Nygård
1: Smart Innovation Norway; 2: Badenova gmbh; 3: NODES Market, 4: NMBU, Norway

10684 *HAPe Optimizing Customer Relation by Automatic Task Distribution Using Constrained Optimization and Natural Language Processing*
Romain Gemignani, Eunice Akani, Jean-Pierre Delrieux, Abdoulaye Sayouti Souleymane
1: ENEDIS, France; 2: Avignon University – France

10697 *Incentive Scheme for Efficient Grid Utilization and Use of Flexibility Services*
Marie Swenman, Maria Dalheim, Carl Johan Wallnerström, Staffan Wikstedt, Linn Sjöström, Albin Emanuelsson
The Swedish Energy Markets Inspectorate

10709 *Performance Comparison of Three Network Tariffs in Combination With a Local Electricity Market*
Sjoerd Doumen, Phuong Nguyen, Koen Kok
Eindhoven University of Technology, The Netherlands

10716 *Grid Performance Optimization Supported By An EV Charging Dynamic Price Formation Model*
Diogo Lopes, Luís Almeida, José Sousa, Rita Mourão
1: Capgemini; 2: E-Redes

10728 *E-REDES Technical-Commercial Forum - a New Approach to Address Technical Complaints Involving Client Damages*
Patrícia Duarte, Miguel Veríssimo, Jad Azar, Luís Fernandes, Tiago Penedos, Carolina Marques, Jorge Santos
E-REDES, Portugal

10752 *A DSO View On Implementing Residential Customer Flexibility In Rural Communities*
Ciaran Geaney, Fergal Egan
ESB Networks, Ireland

10758 *Market-Based Flexibility Services For Congestion Management - A Comprehensive Approach Using The Example Of German Distribution Grids*
David Brummund, Gesa Milzer, Reinhilde D'hulst, Paul Kratsch, Md Umar Hashmi, Louise Adam, Gil Sampaio, Mahtab Kaffash
1: MITNETZ STROM; 2: NODES AS; 3: VITO; 4: E.ON; 5: KU Leuven/EnergyVille; 6: N-SIDE; 7: INESC TEC; 8: Centrica Business Solutions

10775 *Preferences in EV's Smart Charging – Customer Survey*
Antti Raassina, Juhani Lepistö, Samuli Honkapuro, Ville Tikka
1: Helen Electricity Network Ltd, Finland; 2: LUT University

10785 *Smart Metering, Monitoring & Optimising LV Network performance*
Gary Macdonald, Caroline Loughran, Ciaran Higgins
1: Scottish Power Energy Networks, United Kingdom; 2: Scottish Power Energy Networks, United Kingdom; 3: DerryHerk LTD, United Kingdom

10786 *Resilience Services from Battery Storage Degradation*
Mohamed Galeela, Wentao Zhu, Diptargha Chakravorty
TNEI Services, United Kingdom

10804 *Cybersecurity In DSO OT Environment Using Advanced Anomaly Detection*
Peter Ceferin, Damjan Bobek, Aljaž Kmecl, Tomi Kolar, Igor Štih
1: SmartCom, Slovenia; 2: Elektro Celje, Slovenia

10814 *Remuneration And Coordination Aspects Of Flexibility By Power-to-Gas And Gas-to-Power Technologies In Distribution Networks*
Nuran Cihangir Martin, Floris van Lith, Anne van der Molen
Stedin, The Netherlands

10829 *EV Charging Evaluation Using Real-world Datasets: A Case Study Of Energy Consumption, Peak Power, Self-consumption And Self-sufficiency*
Mohamed Yasko, Hans Wouters, Attila Balint, Johan Driesen, Wilmar Martinez
1: KU Leuven, Belgium; 2: EnergyVille, Belgium

10840 *Flexible activation for grid purposes – Experiences from a Norwegian pilot*
Hanne Sæle, Mariona Zhuri, Andrei Morch, Ivan Schytte
1: SINTEF Energi AS, Norway; 2: Lede AS, Norway

10844 *Hierarchical Forecasting for the Management of Distribution Grids*
Simon Camal, Dennis Van Der Meer, Fabrizio Sossan, Georges Kariniotakis
1: MINES PARIS - PSL University - Research Center PERSEE, France; 2: HES-SO Valais Wallis - Institut de Recherche Energie et Environnement

10847 *DN-FLEX: Local-flexibility Market Platforms For Distribution Networks*
Klemen Knez, Boštjan Blažič
University of Ljubljana, Faculty of Electrical Engineering, Slovenia

10852 *Why DSO Involvement In Energy Community Planning Is Expedient*
Selina Kerscher, Naser Hashemipour, Pedro Crespo del Granado
1: University of Oviedo supported by Phoenix Contact, Spain; 2: Norwegian University of Science and Technology, Norway

10863 *Time Series Machine Learning Augmented With Social Network Events To Improve National Electricity Consumption Profile Estimation*
Amr Alyafi, Pierre Cauchois, Benoit Delinchant, Alain Berges
1: G2ELAB, France; 2: ENEDIS, France

10887 *Dynamic Network Tariffs for Efficient Distribution System Utilization*
Tadej Šinkovec, Maja Savinek
Elektro Ljubljana d.d., Slovenia

10896 *Proposal For Improvement Of The Supply Continuity Regulation In Brazil*
Cristiano Silveira, Gustavo Silva, Alden Antunes, Carlos Oliveira, Maurício Dutra, Jyvago Terceiro, Thiago Souza
1: Daimon, Brazil; 2: CELESC-DIS, Brazil

10898 *Predicting Peak Prices in the Current Day-Ahead Market*
Bernt Bremdal, Shayan Dadman
1: Smart Innovation Norway; 2: UiT Campus Narvik

10903 *Smart Transformer as an Energy Community Service Node and Integrator of Local Resources*
Kari Maki, Sergio Motta, Marius Baranauskas, Mika Sillanpaa, Tommi Vahtera, Pasi Ylirisku, Verneri Kohonen
1: VTT Technical Research Centre of Finland, Finland; 2: MSc Electronics, Finland; 3: THT Control, Finland; 4: Caruna, Finland

10907 *A Business Model Analysis Of Different Long Duration Energy Storage Systems In GB Energy Market Conditions*
Borja Carbonell, Roberto Moreira
EDF Energy R&D, United Kingdom

10916 *How Energy Efficiency Business affects Power System and New Business Model Suggestion from DSO*
DeukSeon Yoon, Kyunghoon Kim, Junho Lee
1: KEPCO ES, South Korea; 2: KEPCO ES, South Korea; 3: KEPCO ES, South Korea

10919 *Data Quality Challenges in Existing Distribution Network Datasets*
Frederik Geth, Marta Vanin, Dirk Van Hertem
1: GridQube, Australia; 2: KU Leuven and EnergyVille, Belgium

10928 *Incentive Design for Hybrid ESS Considering Additional Services based on Monte-carlo Simulation*
Yong Soon Kim, Gye Hyun Park, Dam Kim, Seung Wan Kim
Chungnam National University, South Korea

10936 *Integrating Digital Building Flexibility through Sub-aggregator Business Model*
Kari Maki, Matti Aro, Utkarsha Agwan, Hari Prasanna Das, Yu-Wen Lin, Costas Spanos
1: VTT Technical Research Centre of Finland, Finland; 2: University of California Berkeley, USA

10952 *Optimal Scheduling of Flexible Residential Loads Under Demand Response Programs Considering User Comfort*
Mehdi Naserian, Mohammad Jooshaki, Mahmud Fotuhi-Firuzabad, Matti Lehtonen, Fei Wang
1: Aalto University, Finland; 2: Sharif University of Technology; 3: North China Electric Power University; 4: Geologian tutkimuskeskus

10960 *Leveraging Smart Metering Data To Estimate The SAIDI*
François Cordel, Emmanuel Viallis, Laure Detoc, Lisa Laisné, Michel Lapacherie
Enedis, France

10970 *Developing An Electricity Network For Net Zero*
Shauna Graham, Jonathan Pollock, Anne Clarke
NIE Networks, United Kingdom

10973 *All Models Are Wrong, But Some Are Useful: An Exploration Of Validity And Confidence*
Daphne Geelen, Veronika Barta, Age van der Mei, Elias Hartvigsson, Jan-Peter Doomernik, Ricardo Pastor, Balint Hartman
1: Enexis DSO; 2: Endre; 3: Budapest University of Technology and Economics; 4: Duinn; 5: HM University of Applied Sciences Munich; 6: R&D Nester

10979 *Solutions to Manage Local Flexibility Services for the Distribution Grid in the Energy Transition Scenario*
Serena Cianotti, Giulio Lenaz, Macarena Morgaz, Pablo Vargas Barrero
1: enel grids, Italy; 2: enel, Italy; 3: enel grids, Spain; 4: enel grids, Colombia

10990 *FLEX - Winter Trial Of Flexibility Services In Northern Ireland*
David Mills, Thomas Stone, Joel McCreery, Andres Moreno, Cormac Bradley
1: EA Technology, United Kingdom; 2: Northern Ireland Electricity Networks, United Kingdom

11002 *Local flexibility market development at E.ON Hungary*
Gabor Mihaly Peter, Istvan Taczi, Istvan Vokony, Peter Mark Sores, Balint Hartmann, Mark Erdei
1: E.ON Hungary, Hungary; 2: Budapest University of Technology and Economics, Hungary; 3: iContest, Hungary

11009 *Open Data; Delivering Results For Data Stakeholders*
Lewis Jones, Liam McSweeney
National Grid Electricity Distribution, United Kingdom

11010 *Estimating Local Electricity Consumption And Production For Small Geographic Areas using smart meters*
Anne De Moliner, Pierre Cauchois
Enedis, France

11051 *Grid-Friendly Renewable Energy Communities Using Operating Envelopes Provided by DSOs*
Juliana Kainz, Robin Sudhoff, Ruben Liedy, Daniel Hauer, Alfred Einfalt, Gerhard Engelbrecht, Ines Fohler, Christopher Kahler, Daniel Menz, Sebastian Schreck, Andreas Schuster, Sebastian Thiem
1: Siemens AG OEsterreich, Austria; 2: Siemens AG, Germany; 3: ASCR, Austria; 4: Wiener Netze GmbH, Austria

11053 *Environmental And Financial Impact Assessment Of Off-Grid Microgrids Using Energy Storage And PV*
Edmund Schaefer, Yohannes Desta, Erik Goselink, Gerwin Hoogsteen, Johann Hurink, Richard van Leeuwen
1: Saxion University of Applied Sciences, University of Twente, The Netherlands; 2: University of Twente, the Netherlands

11062 *Development Possibilities of Distribution Network Service Charges of Low-Voltage Customers – Apartment Houses as Energy Communities*
Kimmo Lummi, Juha Koskela, Pertti Järventausta
Tampere University, Finland

11070 *Investigating the Role of Flexible Electrical Appliances in a Demand Charge Grid Tariff Scenario - A Norwegian Case Study*
Kasper Emil Thorvaldsen, Erlend Kiel, Hanne Sæle
Sintef Energy Research, Norway

11074 *A State Of the Art Language Model Trained On A Corpus Of Texts Generated From The Set of DSO Activities*
Eunice Akani, Romain Gemignani, Rim Abrougui
1: ENEDIS, France; 2: Aix-Marseille Univ, France

11080 *Technical Impacts of the Deployment of Renewable Energy Communities on Electricity Distribution Grids*
Julien Allard, Arnaud Rosseel, Louise Sadoine, Jamal Faraji, Thomas Brihaye, Filippo Capizzi, Boniface Nteziyaremye, François Bordes, François Vallée, Zacharie De Grève
1: University of Mons, Electrical Power Engineering Unit, Power Systems and Markets Research Group Belgium; 2: University of Mons, Dept of Effective Mathematics, Belgium; 3: ENGIE Laborelec, Belgium; 4: WeSmart, Belgium

11092 *Market Participation of Resilience-enabling Technologies While Prioritizing Resilience-as-a-service*
Xavier Weiss, Lars Nordström, Arne Berlin
1: KTH Royal Institute of Technology, Sweden; 2: Vattenfall Eldistribution AB

11098 *Enabling Heavy-Duty Charging Infrastructure in a Capacity Constrained Grid*
Olav Henrik Skonnord, Iliana Ilieva, Stig Ødegaard Ottesen, Lars Erik Olsen
1: Smart Innovation Norway, Norway; 2: ASKO, Norway

11099 *Review of Emerging Advanced Smart Charging Flexibility Business Models*
Goncalo Mendes, Ville Tikka, Vahid Vahidinasab, Jasmhid Aghaei
1: LUT University; 2: Nottingham Trent University

11107 *Empowering Consumers with 100 % Green Power Solution*
Sharad Bakre, Salman Khan, Nilesh Kane
The Tata Power Company Limited, India

11111 *Analysis Of The Incentive Program For The Voluntary Reduction Of Electricity Consumption In Brazil In 2021 From The Perspective Of Behavioral Economics*
Lindemberg Nunes Reis, Ricardo Brandão Silva, Lucas Malheiros Nunes
ABRADEE, Brazil

11121 *Automated Development of the Software Model of the Distribution Network Based on Field Collected Data and GIS Coordinates*
Vasyl Makohonchuk, Vsevolod Pavlovsky, Levan Khukhunaishvili
1: DMCC Engineering, Ukraine; 2: DMCC Europe, France; 3: ENERGO-PRO Georgia, Georgia

11130 *EUMED Metering, A CIM-based Exchange Model: First Experiments And Perspectives From A DSO*
Fabien Coutant, Gilles Nativel, Bruno Traverson, Eric Lambert, Jérôme Fremont, Benoît Grossin
1: Enedis, France; 2: EDF R&D, France

11131 *Practical experiences of Flexibility market for DSO in Slovenia*
Jurij Curk, Boris Turha
Elektro Ljubljana, Slovenia

11135 *From Ordinary Incentives Regulation To Sandboxes: A New Way To Enhance Continuity Of Supply*
Mariangela Di Napoli, Mariacristina Dota, Alessandra Marasco, Laura Pimpinella
Enel Italia Spa, Italy

11136 *A Framework for Development of Distribution Code towards Decentralized Power System*
Chang Min Lee, Eo Jin Choi, Seung Wan Kim
Dept. of Electrical and Electronic Engineering, Chungnam National University

11150 *Joint and Sequential DSO-TSO Flexibility Markets: Efficiency Drivers and Key Challenges*
Anibal Sanjab, Luciana Marques, Helena Gerard, Kris Kessels
1: Flemish Institute for Technological Research (VITO), Belgium; 2: EnergyVille, Belgium

11152 *Exploring The Opportunities Of Sector Coupling – The Conflicting Interests Of Urban And Rural Energy Systems*
Tuomas Vanhanen, Pertti Järventausta
1: Tampere University, Finland; 2: City of Tampere, Finland

11155 *Simulation And Comparison Of The Impact Of Different Price Tariffs On Grid Utilization*
Alexander Vanselow, Lukas Kalisch, Simon Krahl, Albert Moser
1: FGH e.V., Germany; 2: RWTH Aachen University, Germany

11196 *Industrial Flexibility Options: Impact And Usage As A Service In The High-Voltage Level*
Erik Zipperling, Markus Zdrallek, Franziska Schmaltz
1: University of Wuppertal, Germany; 2: Yncoris GmbH & Co. KG, Germany

11235 *Demonstration Of A Whole Energy Systems Accelerator*
Joseph Melone, David Wyatt, Priya Bhagavathy, Federico Coffele
1: PNDC - University of Strathclyde, United Kingdom; 2: Energy Systems Catapult, United Kingdom

11236 *Flexibility Solutions To Adapt E-REDES Business Management To Face Network Challenges*
Joao Rafael, Margarida Siborro Lopes, Pedro Godinho Matos, Pamela Catrinque Martins
1: E-REDES, Portugal; 2: ENEDIS, France

11243 *Supervised Machine Learning For False Data Injection Detection: Accuracy Sensitivity*
Jaime Turanzas, Monica Alonso, Hortensia Amaris, Josue Gutierrez, Sergio Pastrana
Universidad Carlos III de Madrid, Spain

11244 *Smart Metering Project Serbia 2022 Prospective For DSO Operation Improvements*
Jovan Vujasinović, Saša Gavrilović, Nikola Rajaković
1: University of Belgrade; 2: VF Holding doo, Serbia

11247 *Climate Analysis to Prevent Risk to Distribution Network Assets*
Charlie Dodds, Susan Miller, Alexandra Campbell, Matthew Jones, Malcolm Bebbington, David Cupples
SP Energy Networks, United Kingdom

11255 *Meter Placement Algorithm for Reliable Distribution System State Estimation*
Rafael Steppan, Anna Pfendler, Jutta Hanson
Technical University of Darmstadt, Germany

11256 *Making The Most Of Existing Data – A Data Lake Approach To Risk Quantification*
Joanne Peacock, Dawn O'Brien
EA Technology, United Kingdom

11258 *A Long-term Risk-based Approach To Investment Optimisation*
Dawn O'Brien, Joanne Peacock
EA Technology, United Kingdom

11278 *Creating Bottom Up Load Profiles Using Disaggregation, Clustering and Supervised Machine Learning on Large Smart Meter Dataset*
Jacco Heres, Martijn van Braak, Wieske de Swart, Emma Gerritse
1: Alliander, Netherlands; 2: Radboud University, Netherlands

11281 *Modeling of Risk Aversion Linked to Renewable Energy Policy and Decision-Maker Behavior*
Dieudonne Ecike Ewanga, Irfan Shaikh
1: University of Liège, Belgium; 2: Indian Institute of technology, India

11283 *E-Redes' Asset Management Certification Involves All The Organization And Is Not a Myth*
Cristina Carvalho, Miguel Freitas, Ricardo Prata, Jorge Manuel Gomes, Nuno Ferreira, Pedro Vidal, Edmea Adell, Olivier Pinto
1: E-REDES, Portugal; 2: Assetsman, France; 3: Nexans, France

11307 *Green Fleet Project*
Stanislav Hes, Jan Kula, Katerina Penkavova
CEZ Distribuce, a.s., Czech Republic

11310 *Leveraging Big Data Technologies For Supporting DSO Operations And Adding Business Value To The Collected Data*
Leon Maruša, Kristijan Koželj, Miran Rošer, Boštjan Turinek, Rok Dolinšek, Jure Kop, Andrej Somrak
1: Elektro Celje, Slovenia; 2: Troia, Slovenia

11320 *Use Of Performance Indicators To Encourage Proactive User Behaviours In Renewable Energy Communities*
Riccardo Trevisan, Emilio Ghiani, Fabrizio Pilo
Università degli Studi di Cagliari, Italy

11346 *Business Models For Virtual Power Plants And Their Impact On Economic Operation*
Gary Howorth, Ivana Kockar, Paul Tuohy, Graeme Flett, John Bingham
1: University of Strathclyde, United Kingdom; 2: Engineering Technology Centre Ltd (ETC), United Kingdom

11352 *Impact On The Distribution Network Of An Energy Super-Station*
Jin-Wook Lee, Sung-Won Park, Sung-Yong Son
1: Gachon University, South Korea; 2: Youngsan University, South Korea

11381 *A Scalable Open-Source Co-simulation Framework for Assessing the Effectiveness of Flexibility Activation Mechanisms on Congestion in Dutch Distribution Networks*
Bart van der Holst, Gijs Verhoeven, Edwin Matthijssen, Mark Vrijlandt, Ruduan Plug, Arjen van der Meer, Koen Kok
1: Eindhoven University of Technology, The Netherlands; 2: TNO, The Netherlands; 3: Delft University of Technology, The Netherlands

11385 *Flexibility Baselining In The UK – An Assessment Of Historic Methods*
Owen Patrick, Sarah Sheehy, Gordon McFadzean, Genghao Tian, Nisha Doshi, Daniel Burke
1: TNEI, United Kingdom; 2: SSEN, United Kingdom

11394 *A Review on Local Flexibility Market Advancements: Practices in Nordic Countries*
Milad Mousavi, Manuel Alvarez, Jin Zhong
1: Luleå University of Technology, Sweden; 2: The University of Hong Kong

11400 *Standardization ISO55000 & PAS55*
Ivan Valbuena, Carolina Morales
Enel Colombia, Colombia

11404 *Method for the Assessment of Structural Parameters for Distribution Grid Cost Drivers*
Luis Böttcher, Simon Braun, Antigona Selimaj, Antoni Chajan, Andreas Ulbig
IAEW at RWTH Aachen University, Germany

11440 *An Asset Management Machine Learning Application*
André Sampaio Holanda de Oliveira, Wellington Rodrigues da Silva, Kleber Hashimoto, Denis Antonelli, Gustavo Sacchi Silva, Cristiano Silva Silveira, Vitor Takeda, João Vitor Martinho do Prado
1: Daimon Engenharia e Sistemas, Brazil; 2: Enel Brasil, Brazil

11447 *Architectural And Systems Approach To Sustainable Digital Transformation Of Distribution Utilities*
Mayank Sharma, Nand Kishor Narang, Tom Berry
1: Schneider Electric, France; 2: Narnix Technolabs

11489 *Effects of Tariff Structures to the Revenue Streams of Local Energy Systems*
Nikolaos Chrysanthopoulos, Dimitrios Papadaskalopoulos, Goran Strbac
Imperial College London, United Kingdom

11498 *Proactive Complaint Management with ClientID*
Davide Raposo, Inês Graça, Isabel Preto, Ricardo Santos
1: E-REDES, Portugal; 2: Smartwatt