

# **2019 IEEE Milan PowerTech**

**Milan, Italy**  
**23-27 June 2019**

**Pages 1-870**



**IEEE Catalog Number: CFP19815-POD**  
**ISBN: 978-1-5386-4723-3**

**Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc.  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

|                         |                   |
|-------------------------|-------------------|
| IEEE Catalog Number:    | CFP19815-POD      |
| ISBN (Print-On-Demand): | 978-1-5386-4723-3 |
| ISBN (Online):          | 978-1-5386-4722-6 |

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# TABLE OF CONTENTS

|   |     |
|---|-----|
| <b>NEW PLANNING FOR THE 500KV VIETNAMESE GRID WITH HIGH PENETRATION OF RENEWABLE ENERGY SOURCES</b> .....   | 1   |
| <i>M. Q. Duong ; H. H. Nguyen ; T. Le ; Marco Mussetta</i>  |     |
| <b>OPTIMAL SCHEDULING OF HOME APPLIANCES IN HOME ENERGY MANAGEMENT SYSTEMS USING GREY WOLF OPTIMISATION (GWO) ALGORITHM</b> .....                                   | 7   |
| <i>Ahmad Rezaee Jordehi</i>   |     |
| <b>A COMPARATIVE STUDY ON FEATURE SELECTION BASED IMPROVEMENT OF MEDIUM-TERM DEMAND FORECAST ACCURACY</b> .....   | 13  |
| <i>Engin Ilseven ; Murat Gol</i>  |     |
| <b>A MIXED INTEGER SDP METHOD FOR OPTIMAL METER PLACEMENT IN POWER TRANSMISSION SYSTEMS</b> .....   | 19  |
| <i>Themistoklis C. Xygkis ; George N. Korres ; Nikolaos M. Manousakis</i>   |     |
| <b>IMPACT OF REALISTIC BUS FREQUENCY MEASUREMENTS ON WIDE-AREA POWER SYSTEM STABILIZERS</b> .....   | 25  |
| <i>Georgios Tzounas ; Muyang Liu ; Mohammed Ahsan Adib Murad ; Federico Milano</i>  |     |
| <b>CONDITIONAL VALUE OF LOST LOAD BASED UNIT COMMITMENT IN MICROGRID CONSIDERING UNCERTAINTY IN BATTERY SWAP STATION</b> .....                                      | 31  |
| <i>Ferinar Moaidi ; Masoud Aliakbar Golkar</i>  |     |
| <b>DEMAND RESPONSE APPLICATION OF BATTERY SWAP STATION USING A STOCHASTIC MODEL</b> .....   | 37  |
| <i>Ferinar Moaidi ; Masoud Aliakbar Golkar</i>  |     |
| <b>ADAPTIVE FAST FREQUENCY RESPONSE FOR POWER ELECTRONIC CONNECTED ENERGY SOURCES</b> .....   | 43  |
| <i>John Fradley ; Robin Preece ; Mike Barnes</i>  |     |
| <b>POLE VOLTAGE BALANCING IN HVDC SYSTEMS: ANALYSIS AND TECHNOLOGY OPTIONS</b> .....  | 49  |
| <i>M. Wang ; J. Beerten ; D. Van Hertem</i>   |     |
| <b>POWER QUALITY MONITORING USING SYNCHRONIZED PHASOR MEASUREMENTS: AN APPROACH BASED ON HARDWARE-IN-THE-LOOP SIMULATIONS</b> .....                                 | 55  |
| <i>Igor Delgado De Melo ; José Luiz Rezende Pereira ; Carlos Augusto Duque ; Matheus Pereira Antunes ; Leandro Rodrigues Manso Silva ; Matheus Alberto De Souza</i> |     |
| <b>EXPRESSION FOR CONDUCTOR RESISTANCE IN THE FREQUENCY RANGE 2-150 KHZ</b> .....   | 61  |
| <i>Ángela Espín-Delgado ; Sarah K. Rönnerberg ; Math H. J. Bollen</i>   |     |
| <b>ISSUES AND CHALLENGES OF STEADY-STATE FAULT CALCULATION METHODS IN POWER SYSTEMS WITH A HIGH PENETRATION OF NON-SYNCHRONOUS GENERATION</b> .....                 | 67  |
| <i>R. Aljarrah ; H. Marzooqhi ; V. Terzija ; J. Yu</i>  |     |
| <b>SUSTAINABLE ISLANDING SYSTEM BASED ON DUAL POWER INVERTERS WITH COOPERATIVE GENERATOR</b> .....  | 73  |
| <i>Sewan Heo ; Jinsoo Han ; Wan-Ki Park</i>   |     |
| <b>HOW CAN SMART BUILDINGS BE PRICE-RESPONSIVE?</b> .....   | 79  |
| <i>Ricardo Fernández-Blanco ; Juan Miguel Morales ; Salvador Pineda</i>   |     |
| <b>EXTENDING THE REACH OF TRADITIONAL FREQUENCY CONTROL FOR FAST RESPONSES</b> .....  | 85  |
| <i>Jean B. Ubertalli ; T. B. Littler</i>  |     |
| <b>TEMPERATURE-DEPENDENT RADIAL POWER FLOW WITH DISTRIBUTED GENERATION</b> .....  | 91  |
| <i>A. F. Picanco ; A. C. Zambroni De Souza</i>  |     |
| <b>IMPACT OF WIND SPEED DISTORTIONS ON CHILEAN POWER SYSTEM EXPANSION PLANNING</b> .....  | 97  |
| <i>Enzo Sauma ; Catalina Rosende</i>  |     |
| <b>AN INCREASE IN INFORMATION SECURITY OF ELECTRIC POWER SYSTEM WITH WIND POWER PENETRATION UNDER LOW REDUNDANCY OF MEASUREMENTS</b> .....                          | 102 |
| <i>A. M. Glazunova ; E. S. Aksaeva</i>  |     |
| <b>IMPACT OF THE PERIODICITY OF FEEDER RE-ALLOCATION ON THE EFFICIENCY OF UNDER-FREQUENCY LOAD SHEDDING</b> .....   | 108 |
| <i>Barnabé Potel ; Florent Cadoux ; Vincent Debusschere ; Leticia De Alvaro Garcia</i>  |     |
| <b>IMPLEMENTATION OVERVIEW OF A NOVEL APPROACH TO SMART MICROGRID REAL TIME SIMULATION</b> .....  | 114 |
| <i>H. Palahalli ; Y. Huo ; G. Grusso</i>  |     |
| <b>OPTIMAL OPERATION OF BATTERY ENERGY STORAGE SYSTEM IN SMART GRID FOR REDUCING TAP CHANGER OPERATION UNDER PHOTOVOLTAIC FLUCTUATION USING CUCKOO SEARCH</b> ..... | 120 |
| <i>Keerachat Tantrapon ; Peerapol Jirapong ; Panida Thararak ; Kannathat Mansuwan</i>   |     |
| <b>ECONOMIC IMPACT OF THE ACTIVE POWER DROOP GAIN IN DROOP-BASED ISLANDED MICROGRIDS</b> .....  | 126 |
| <i>Pedro P. Vergara ; Juan C. López ; Luiz C. P. Da Silva ; Marcos J. Rider</i>   |     |
| <b>TRANSMISSION LINE UNAVAILABILITY DUE TO CORRELATED THREAT EXPOSURE</b> .....   | 132 |
| <i>Erlend Sandø Kiel ; Gerd Hovin Kjølle</i>  |     |

|  |            |
|--|------------|
| <b>CONTINUATION POWER FLOW ANALYSIS OF DISTRIBUTION SYSTEMS UNDER UNCERTAINTY USING MODIFIED AFFINE ARITHMETIC .....</b>               | <b>138</b> |
| <i>Bala Surendra Adusumilli ; Boddeti Kalyan Kumar</i>   |            |
| <b>ON THE LIMITATIONS OF VOLT-VAR CONTROL IN PV-RICH RESIDENTIAL LV NETWORKS: A UK CASE STUDY .....</b>                                | <b>144</b> |
| <i>Andreas T. Procopiou ; Luis F. Ochoa</i>  |            |
| <b>SENSITIVITY ANALYSIS OF A LOCAL MARKET MODEL FOR COMMUNITY MICROGRIDS .....</b>   | <b>150</b> |
| <i>Laurine Duchesne ; Bertrand Comélusse ; Iacopo Savelli</i>  |            |
| <b>EFFICIENT CONVEX OPTIMIZATION FOR OPTIMAL PMU PLACEMENT IN LARGE DISTRIBUTION GRIDS.....</b>  | <b>156</b> |
| <i>Miguel Picallo ; Adolfo Anta ; Bart De Schutter</i>   |            |
| <b>EVALUATION OF THE UNCERTAINTIES USED TO PERFORM FLOW SECURITY ASSESSMENT: A REAL CASE STUDY .....</b>                               | <b>162</b> |
| <i>M. H. Vasconcelos ; C. Gonçalves ; J. Meirinhos ; N. Omont ; A. Pitto ; G. Ceresá</i>   |            |
| <b>METAHEURISTIC-BASED DESIGN AND OPTIMIZATION OF OFFSHORE WIND FARMS COLLECTION SYSTEMS.....</b>                                      | <b>168</b> |
| <i>Daniel Hermosilla Minguijón ; Juan-Andrés Pérez-Rúa ; Kaushik Das ; Nicolaos A. Cutululis</i>                                       |            |
| <b>APPLICATION OF FILIPPOV THEORY TO THE IEEE STANDARD 421.5-2016 ANTI-WINDUP PI CONTROLLER.....</b>                                   | <b>174</b> |
| <i>Mohammed Ahsan Adib Murad ; Brendan Hayes ; Federico Milano</i>   |            |
| <b>EQUIVALENT CIRCUIT PROGRAMMING FOR ESTIMATING THE STATE OF A POWER SYSTEM.....</b>  | <b>180</b> |
| <i>Marko Jereminov ; Martin R. Wagner ; Aleksandar Jovicic ; Gabriela Hug ; Larry Pileggi</i>  |            |
| <b>A PROPOSAL TO MITIGATE OVER-VOLTAGE ISSUE WITHIN PERIOD OF 2017-2020 AND A VISION TO 2025 IN CENTRAL VIETNAM.....</b>               | <b>186</b> |
| <i>Le Hong Lam ; Ngo Van Duong</i>   |            |
| <b>A PERFORMANCE METRIC FOR CO-OPTIMIZATION OF DAY-AHEAD DISPATCH AND RESERVES IN ELECTRIC MICROGRIDS .....</b>                        | <b>192</b> |
| <i>Mayank Panwar ; Rob Hovsopian ; Robin Roche ; Sid Suryanarayanan</i>  |            |
| <b>MAXIMUM POWER POINT TRACKING OF PHOTOVOLTAIC SYSTEM USING TAGUCHI-BASED FUZZY LOGIC CONTROL.....</b>                                | <b>198</b> |
| <i>Ying-Yi Hong ; Peter Mark P. Buay ; Angelo A. Beltran</i>   |            |
| <b>VERIFICATION OF LINEAR FLEXIBILITY RANGE ASSESSMENT IN DISTRIBUTION GRIDS.....</b>  | <b>204</b> |
| <i>Daniel A. Contreras ; Krzysztof Rudion</i>  |            |
| <b>OPTIMAL ENERGY MANAGEMENT OF UNBALANCED THREE-PHASE GRID-CONNECTED MICROGRIDS .....</b>   | <b>210</b> |
| <i>Juan S. Giraldo ; Jhon A. Castrillon ; Carlos A. Castro ; Federico Milano</i>   |            |
| <b>LPV MODELING OF CLUSTERS IN DYNAMIC POWER SYSTEM MODELS.....</b>  | <b>216</b> |
| <i>Johnny Leung ; Michel Kinnaert ; Jean-Claude Maun ; Fortunato Villella</i>  |            |
| <b>IMPACT OF CARBON TAX FLEXIBILITY ON THE CHILEAN POWER SYSTEM EXPANSION PLANNING .....</b>   | <b>222</b> |
| <i>Andrés Pereira ; Enzo Sauma ; Juan Montero</i>  |            |
| <b>TWO-STAGE GENERAL VARIABLE NEIGHBORHOOD SEARCH ALGORITHM TO SOLVE THE STATIC TRANSMISSION NETWORK EXPANSION PLANNING .....</b>      | <b>228</b> |
| <i>Gustavo Rebello ; Edimar Jose De Oliveira ; Marina Borges</i>   |            |
| <b>TRANSACTIVE ENERGY TRADING OF RESIDENTIAL PROSUMERS USING BATTERY ENERGY STORAGE SYSTEMS.....</b>                                   | <b>234</b> |
| <i>M. S. H. Nizami ; M. J. Hossain ; B. M. R. Amin ; Muhammad Kashif ; Edstan Fernandez ; Khizir Mahmud</i>                            |            |
| <b>PYTHON BASED SCENARIO DESIGN AND PARALLEL SIMULATION METHOD FOR TRANSIENT ROTOR ANGLE STABILITY ASSESSMENT IN POWERFACTORY.....</b> | <b>240</b> |
| <i>Sohail Khan ; Aadil Latif</i>   |            |
| <b>INTERHARMONIC MODELING AND SIMULATION VIA THE FLEXIBLE EXTENDED HARMONIC DOMAIN .....</b>   | <b>246</b> |
| <i>Uriel Vargas ; Abner Ramirez ; George Cristian Lazaroiu ; Mariacristina Roscia</i>  |            |
| <b>ROBUST <math>L_1</math> ESTIMATORS FOR INTERCONNECTED AC/DC POWER SYSTEMS.....</b>  | <b>252</b> |
| <i>Arthur Mouco ; Ali Abur</i>   |            |
| <b>DECENTRALIZED CHARGING CONTROL OF BATTERY ENERGY STORAGE SYSTEMS FOR DISTRIBUTION SYSTEM ASSET MANAGEMENT.....</b>                  | <b>258</b> |
| <i>Riku Okubo ; Shinya Yoshizawa ; Yasuhiro Hayashi ; Shunsuke Kawano ; Tomihiro Takano ; Nobuhiko Itaya</i>                           |            |
| <b>MARKET OPERATIONS USING SWING CONTRACTS FOR DEMAND RESPONSE AND ENERGY STORAGE.....</b>   | <b>264</b> |
| <i>Ashim Basnet ; Jin Zhong</i>  |            |
| <b>DESIGN AND CONTROL OF A SWITCHED-DIODE MULTILEVEL INVERTER FOR PHOTOVOLTAIC APPLICATION .....</b>                                   | <b>270</b> |
| <i>Kaibalya Prasad Panda ; Prabhat Ranjan Bana ; Gayadhar Panda</i>  |            |
| <b>BATTERY ENERGY STORAGE DEGRADATION IMPACT ON NETWORK RELIABILITY AND WIND ENERGY CURTAILMENTS .....</b>                             | <b>276</b> |
| <i>M. Abogaleela ; K. Kopsidas</i>   |            |
| <b>OPTIMUM COMMUNICATION NETWORK DESIGN FOR DISTRIBUTED SECONDARY VOLTAGE CONTROL IN MICROGRIDS .....</b>                              | <b>282</b> |
| <i>Farideh Doost Mohammadi ; Hessam Keshkar ; Ali Feliachi</i>   |            |

|  |            |
|--|------------|
| <b>APPLICATION OF UTILITY-CONNECTED BATTERY ENERGY STORAGE SYSTEM FOR INTEGRATED DYNAMIC SERVICES .....</b>  | <b>288</b> |
| <i>Mehdi Ghazavi Dozein ; Pierluigi Mancarella</i>   |            |
| <b>AUTONOMOUS SOFT OPEN POINT CONTROL FOR ACTIVE DISTRIBUTION NETWORK VOLTAGE LEVEL MANAGEMENT .....</b>   | <b>294</b> |
| <i>Hossein Hafezi ; Hannu Laaksonen</i>  |            |
| <b>IMPROVING THE SCALABILITY OF A PROSUMER COOPERATIVE GAME WITH K-MEANS CLUSTERING.....</b>   | <b>300</b> |
| <i>Liyang Han ; Thomas Morstyn ; Constance Crozier ; Malcolm McCulloch</i>   |            |
| <b>COMPUTATION OF SUBTRANSMISSION LOSSES BASED ON STATISTICAL OPTIMIZATION APPROACH WITH NETWORK CONSTRAINTS .....</b>                                       | <b>306</b> |
| <i>Delberis Araujo Lima ; Sergio A. Álvarez Cardenas</i>   |            |
| <b>AN EXTENDED METRIC FOR THE ANALYSIS OF POWER-NETWORK VULNERABILITY: THE LINE ELECTRICAL CENTRALITY .....</b>  | <b>312</b> |
| <i>Rafael Espejo ; Sara Lumbreras ; Andres Ramos ; Tao Huang ; Ettore Bompard</i>  |            |
| <b>ANALYSIS OF ANGULAR THRESHOLD CRITERIA FOR TRANSIENT INSTABILITY IDENTIFICATION IN UNCERTAIN POWER SYSTEMS .....</b>                                      | <b>317</b> |
| <i>Juan D. Morales ; Jovica V. Milanovic ; Panagiotis N. Papadopoulos</i>  |            |
| <b>THERMAL INTERACTIONS IN MODERN LIGHTING EQUIPMENT DUE TO DISTURBANCES IN THE FREQUENCY RANGE 2–150 KHZ .....</b>  | <b>323</b> |
| <i>Victor Khokhlov ; Jan Meyer ; Peter Schegner</i>  |            |
| <b>PERFORMANCE ASSESSMENT OF DISTANCE PROTECTION IN SYSTEMS WITH HIGH PENETRATION OF PVS .....</b>   | <b>329</b> |
| <i>Alexander Novikov ; Jose Jesus De Chavez ; Marjan Popov</i>   |            |
| <b>MODEL ORDER REDUCTION OF ACTIVE DISTRIBUTION NETWORKS WITH TSO-DSO INTERCONNECTION POWER FLOW CONTROL.....</b>  | <b>335</b> |
| <i>Holm Hinners ; Daniel Mayorga Gonzalez ; Johanna M. A. Myrzik</i>   |            |
| <b>STATISTICAL METHODS FOR CONDITION ASSESSMENT OF LOW-FAILURE ASSETS .....</b>  | <b>341</b> |
| <i>Maikel Klerx ; Johan Morren ; Han Slootweg</i>  |            |
| <b>EVALUATION OF THE IMPACT OF LED AND COMPACT FLUORESCENT LAMPS ON THE PLC TRANSMISSION WITH X-10 TECHNOLOGY .....</b>                                      | <b>347</b> |
| <i>A. S. Delfino ; R. P. Brandão ; T. S. Bumpus ; M. Z. Fortes ; H. O. Henriques ; V. H. Ferreira</i>  |            |
| <b>REAL-TIME HARDWARE-IN-THE-LOOP PLATFORM FOR HYBRID AC/DC POWER SYSTEM STUDIES .....</b>   | <b>353</b> |
| <i>Tibin Joseph ; Khadijat Jose ; Carlos E. Ugalde-Loo ; Gen Li ; Jun Liang</i>  |            |
| <b>A NEW APPROACH OF CONTI-VARLET METHOD APPLIED TO A PV SYSTEM TO SIZE A BATTERY ENERGY STORAGE .....</b>   | <b>359</b> |
| <i>Paulo A. V. Vieira ; Edson C. Bortoni ; Arturo S. Bretas</i>  |            |
| <b>DECISION MAKING ON GENERATOR FOR WIND TURBINES USING THE AHP METHODOLOGY.....</b>   | <b>364</b> |
| <i>Davi F. De Paiva ; Natan Santos ; Edson C. Bortoni ; Roberto A. Yamachita</i>   |            |
| <b>A PARALLEL PROCESSING APPROACH TO STABILITY ANALYSIS CONSIDERING TRANSMISSION AND DISTRIBUTION SYSTEMS.....</b>   | <b>369</b> |
| <i>Angie D. Vasquez ; Thales Sousa</i>   |            |
| <b>A STOCHASTIC MARKET-CLEARING MODEL USING SEMIDEFINITE RELAXATION .....</b>  | <b>375</b> |
| <i>Erik F. Alvarez ; Juan C. López ; Pedro P. Vergara ; Jefferson J. Chavez ; Marcos J. Rider</i>  |            |
| <b>LOCATING FAULTS ON TRANSMISSION LINES USING UNSCENTED KALMAN FILTER.....</b>  | <b>381</b> |
| <i>Sayari Das ; Bijaya Ketan Panigrahi</i>   |            |
| <b>FIELD MEASUREMENTS AND MODEL COMPARISON FOR A VERY LONG SUBMARINE HV AC THREE-CORE CABLE .....</b>  | <b>387</b> |
| <i>F. Palone ; F. M. Gatta ; A. Geri ; S. Lauria ; M. Maccioni ; B. Ceresoli</i>   |            |
| <b>OPERATIONAL OPTIMIZATION OF A MICROGRID WITH DIFFERENTIAL ALGEBRAIC CONSTRAINTS .....</b>   | <b>393</b> |
| <i>Ruben De Girardier ; Anastasios Oulis Rousis ; Ioannis Konstantelos ; Goran Strbac</i>  |            |
| <b>RISK-ADJUSTED COST RATIOS FOR QUANTIFYING IMPROVEMENTS IN WIND POWER FORECASTING.....</b>   | <b>399</b> |
| <i>Fathalla Eldali ; Siddharth Suryanarayanan ; Mauricio E. Samper</i>   |            |
| <b>COORDINATION OF LOCAL AND CENTRAL ELECTRICITY MARKETS FOR PROVIDING BALANCING SERVICES .....</b>  | <b>405</b> |
| <i>Yaser Tohidi ; Madeleine Gibescu</i>  |            |
| <b>MODELING AN OPTIMAL PEER-TO-PEER ENERGY SHARING BETWEEN PROSUMERS IN A SOUTH AFRICAN CONTEXT.....</b>   | <b>411</b> |
| <i>K. Kusakana</i>   |            |
| <b>INVESTMENT MODEL FOR COST-EFFECTIVE INTEGRATION OF SOLAR PV CAPACITY UNDER UNCERTAINTY USING A PORTFOLIO OF ENERGY STORAGE AND SOFT OPEN POINTS .....</b> | <b>417</b> |
| <i>Spyros Giannelos ; Ioannis Konstantelos ; Goran Strbac</i>  |            |
| <b>MODELLING THE GROWTH OF DG MARKET AND THE IMPACT OF INCENTIVES ON ITS DEPLOYMENT: COMPARING FIXED ADOPTION AND SYSTEM DYNAMICS METHODS IN BRAZIL.....</b> | <b>423</b> |
| <i>M. D. P. Coelho ; J. T. Saraiva ; G. Konzen ; M. C. Araujo ; A. J. C. Pereira</i>   |            |
| <b>A CO-SIMULATION FRAMEWORK FOR POWER SYSTEMS AND COMMUNICATION NETWORKS .....</b>  | <b>429</b> |
| <i>Welin Zhong ; Muyang Liu ; Federico Milano</i>  |            |

|  |     |
|--|-----|
| <b>LINE SELECTION AND ALGORITHM SELECTION FOR TRANSMISSION SWITCHING BY MACHINE LEARNING METHODS</b> .....   | 435 |
| <i>Zhu Yang ; Shmuel Oren</i>  |     |
| <b>TOPOLOGY CONTROL IN POWER SYSTEM USING VISUALIZATION</b> .....  | 441 |
| <i>Rao Fu ; Hyungseon Oh ; Ilya Grinberg</i>   |     |
| <b>IMPACTS OF PRICE-LED OPERATION OF RESIDENTIAL STORAGE ON DISTRIBUTION NETWORKS: AN AUSTRALIAN CASE STUDY</b> .....  | 446 |
| <i>Kyriacos Petrou ; Andreas T. Procopiou ; Luis F. Ochoa ; Tom Langstaff ; John Theunissen</i>  |     |
| <b>A ROBUST OPTIMIZATION FRAMEWORK FOR THE DAY-AHEAD SCHEDULING OF ACTIVE DISTRIBUTION NETWORKS INCLUDING ENERGY STORAGE SYSTEMS</b> .....                               | 452 |
| <i>Mostafa Nick ; Mokhtar Bozorg ; Rachid Cherkaoui ; Mario Paolone</i>  |     |
| <b>LFC MODEL FOR FREQUENCY STABILITY ANALYSIS OF PROSPECTIVE POWER SYSTEMS WITH HIGH SHARES OF INVERTER BASED GENERATION</b> .....                                       | 458 |
| <i>Arun Kannan ; Maria Nuschke ; Diana Strau-Mincu</i>   |     |
| <b>THE EFFECTS OF RESIDENTIAL BATTERY STORAGE ON GRID IMPACT INDICATORS</b> .....  | 464 |
| <i>Vladimir Gjorgievski ; Snezana Cundeva</i>  |     |
| <b>ACTIVE MANAGEMENT OF LV RESIDENTIAL NETWORKS UNDER HIGH PV PENETRATION</b> .....  | 470 |
| <i>S. M. N. R. Abadi ; M. Mahmoodi ; P. Scott ; L. Blackhall ; S. Thiebaux</i>   |     |
| <b>DESIGN OF PROPORTIONAL-RESONANT CONTROLLER WITH ZERO STEADY-STATE ERROR FOR A SINGLE-PHASE GRID-CONNECTED VOLTAGE SOURCE INVERTER WITH AN LCL OUTPUT FILTER</b> ..... | 476 |
| <i>Ahmad Ali Nazeri ; Peter Zacharias ; Federico Martin Ibanez ; Sakda Somkun</i>  |     |
| <b>PSEUDO-VALUE GENERATION FOR LOW VOLTAGE STATE ESTIMATION WITH POOR INPUT DATA FROM SMART METER USING GRADIENT DESCENT METHOD</b> .....                                | 482 |
| <i>Marco Weisenstein ; Wolfram Wellssow ; Robert Brandalik</i>   |     |
| <b>THE IMPACTS OF AN INTEGRATED EUROPEAN DAY-AHEAD AND INTRADAY ELECTRICITY MARKET ON MARKET PERFORMANCE: THE IBERIAN REGION CASE</b> .....                              | 488 |
| <i>Shaghayegh Zalzar ; Ettore Francesco Bompard</i>  |     |
| <b>INTRODUCTION OF CURRENT LIMITING IMPEDANCE FOR A PREVIOUSLY SOLID GROUNDED MEDIUM VOLTAGE DISTRIBUTION NETWORK</b> .....  | 494 |
| <i>Alex Castro ; Dario Zaminelli</i>   |     |
| <b>A SMART VOLTAGE OPTIMIZATION APPROACH FOR INDUSTRIAL LOAD DEMAND RESPONSE</b> .....   | 500 |
| <i>Adarsh Madhavan ; Brian Lee ; Claudio A. Cañizares ; Kankar Bhattacharya</i>  |     |
| <b>ROCOF-BASED IMPROVEMENT OF CONVENTIONAL UNDER-FREQUENCY LOAD SHEDDING</b> .....   | 506 |
| <i>Urban Rudez ; Rafael Mihalic</i>  |     |
| <b>GOVERNOR PARAMETER ESTIMATION CONSIDERING UPPER/LOWER PRODUCTION LIMITS</b> .....   | 511 |
| <i>Mahsa Sajjadi ; Hossein Seifi</i>   |     |
| <b>POWER FLOW ANALYSIS OF ISLANDED AC MICROGRIDS</b> .....   | 517 |
| <i>Eleftherios O. Kontis ; Georgios C. Kroyonidis ; Angelos I. Nousedilis ; Kyriaki-Nefeli D. Malamaki ; Grigoris K. Papagiannis</i>                                     |     |
| <b>ARCHETYPES OF COUNTRY ENERGY SYSTEMS</b> .....  | 523 |
| <i>M. Küppers ; M. Metzger ; M. Huber ; S. Paulus</i>  |     |
| <b>POWER HARDWARE-IN-THE-LOOP SETUP FOR DEVELOPING, ANALYZING AND TESTING MODE IDENTIFICATION TECHNIQUES AND DYNAMIC EQUIVALENT MODELS</b> .....                         | 529 |
| <i>Eleftherios O. Kontis ; Angelos I. Nousedilis ; Grigoris K. Papagiannis ; Mazheruddin H. Syed ; Efen Guillo-Sansano ; Graeme M. Burt ; Theofilos A. Papadopoulos</i>  |     |
| <b>SENSITIVITY ANALYSIS OF THE INTERACTION BETWEEN POWER SYSTEM DYNAMICS AND UNIT COMMITMENT</b> .....   | 535 |
| <i>Taulant Kërçi ; Federico Milano</i>   |     |
| <b>MANIPULABILITY OF COST AND BENEFIT ALLOCATION IN CROSS-BORDER ELECTRICAL INTERCONNECTION PROJECTS</b> .....   | 541 |
| <i>Andrey Churkin ; David Pozo ; Janusz Bialek ; Nikolay Korgin ; Enzo Sauma</i>   |     |
| <b>LOAD FORECASTING OF PRIVACY-AWARE CONSUMERS</b> .....   | 547 |
| <i>Jun-Xing Chin ; Thierry Zufferey ; Etta Shyti ; Gabriela Hug</i>  |     |
| <b>PROBABILISTIC SIZING OF PV GENERATION ON COMMERCIAL PARKING LOT WITH PEVS TO AVOID TRANSFORMER AGING</b> .....  | 553 |
| <i>Carolina De Mattos Affonso ; Mladen Kezunovic</i>   |     |
| <b>AN EFFICIENT DECISION-MAKING APPROACH FOR OPTIMAL ENERGY MANAGEMENT OF MICROGRIDS</b> .....   | 559 |
| <i>Najmeh Bazmohammadi ; Ali Karimpour ; Somayyeh Bazmohammadi ; Amjad Anvari-Moghaddam ; Josep M. Guerrero</i>  |     |
| <b>ADAPTIVE ASSET CONGESTION MANAGEMENT IN PV-RICH LV NETWORKS</b> .....   | 565 |
| <i>Andreas T. Procopiou ; Luis F. Ochoa</i>  |     |
| <b>ELECTRIC VEHICLES CHARGING OPTIMIZATION CONSIDERING EVS AND LOAD UNCERTAINTIES</b> .....  | 570 |
| <i>Leonardo Bitencourt ; Bruno Dias ; Tiago Abud ; Bruno Borba ; Márcio Fortes ; Renan S. Maciel</i>   |     |
| <b>PRICING MECHANISM FOR DEMAND RESPONSE BASED ON PENALTY PARADIGM</b> .....   | 576 |
| <i>Ashim Basnet ; Jin Zhong</i>  |     |
| <b>A V2G STRATEGY FOR COST-COMPETITIVE PRIMARY FREQUENCY REGULATION CONSIDERING EV BATTERY DEGRADATION</b> .....   | 581 |
| <i>Shigeru Tamura</i>  |     |
| <b>ECONOMIC ANALYSIS ON MULTI-TERMINAL VSC HVDC SYSTEMS WITH WIND FARMS BASED ON HIERARCHICAL OPTIMAL POWER FLOW WITH STABILITY CONSTRAINT</b> .....                     | 587 |
| <i>Sangwon Kim ; Akihiko Yokoyama ; Yusuke Takaguchi ; Tomihiro Takano ; Kazuyuki Mori ; Yoshio Izui</i>   |     |

|  |     |
|--|-----|
| <b>OPTIMAL SENSOR PLACEMENT METHODOLOGY BASED ON FDTD FOR PARTIAL DISCHARGE DETECTION IN GIS</b> .....   | 593 |
| <i>Kwang-Seok Kim ; Ju-Ik Oh ; Jong-Won Yu ; Jin-Ho Lee ; Chang-Hwan Jin ; Min-Gyu Kim</i>   |     |
| <b>INTRA-AREA MODE: MEASUREMENT-BASED AND MODEL-BASED ASSESSMENT IN INDIAN POWER SYSTEM</b> .....  | 598 |
| <i>Chandan Kumar ; Pushpa Seshadri ; Akhil Gupta ; Rahul Shukla ; Pradeep Kumar Sanodiya</i>   |     |
| <b>SIMULTANEOUS OPTIMAL PLACEMENT AND SIZING OF DSTATCOM AND PARALLEL CAPACITORS IN DISTRIBUTION NETWORKS USING MULTI-OBJECTIVE PSO</b> .....                      | 604 |
| <i>Arash Zeinalzadeh ; Abouzar Estebarsari ; Alireza Bahmanyar</i>   |     |
| <b>FEATURE- AND STRUCTURE-PRESERVING NETWORK REDUCTION FOR LARGE-SCALE TRANSMISSION GRIDS</b> .....  | 610 |
| <i>Julia Sistermanns ; Matthias Hotz ; Wolfgang Utschick ; Dominic Hewes ; Rolf Witzmann</i>   |     |
| <b>ASSESSING THE EFFECT OF PREVENTIVE ISLANDING ON POWER GRID RESILIENCE</b> .....   | 616 |
| <i>Matthias Noebels ; Mathaios Panteli</i>   |     |
| <b>ADAPTIVE LOCAL-LEARNING MODELS FOR SYNCHROPHASOR-BASED DYNAMIC THERMAL RATING</b> .....   | 622 |
| <i>Antonio Pepicciello ; Guido Coletta ; Alfredo Vaccaro</i>   |     |
| <b>PASSIVITY-BASED CONTROL FOR A PV/BATTERY/FUEL CELL/ELECTROLYSER HYBRID POWER SYSTEM</b> .....   | 628 |
| <i>S. Kong ; M. Hilairret ; R. Roche</i>   |     |
| <b>STOCHASTIC OPTIMIZATION FRAMEWORK FOR ONLINE SCHEDULING OF AN EV CHARGING STATION IN A RESIDENTIAL PLACE WITH PHOTOVOLTAICS AND ENERGY STORAGE SYSTEM</b> ..... | 634 |
| <i>Gustavo Aragón ; Otilia Werner-Kytölä ; Erdem Gümrükcü</i>  |     |
| <b>STATE DURATION BASED EVENT DETECTION FOR DOMESTIC POWER DISAGGREGATION</b> .....  | 640 |
| <i>Liya Ma ; Peter Schegner</i>  |     |
| <b>DETERMINATION OF MAXIMUM WIND POWER PENETRATION CONSIDERING WIND TURBINE FAST FREQUENCY RESPONSE</b> .....  | 646 |
| <i>Elyas Rakhshani ; Jose Luis Rueda Torres ; Peter Palensky ; Mart Der Van Meijden</i>  |     |
| <b>MITIGATION OF IGNITION CURRENT SPIKE CAUSING FROM FORWARD BIAS DRIFT FOR LASER DIODE DRIVER</b> .....   | 652 |
| <i>Kai-Jun Pai</i>   |     |
| <b>JOINT INVESTMENT AND OPERATION OPTIMIZATION OF A DISTRIBUTION SYSTEM IN A MARKET ENVIRONMENT</b> .....  | 658 |
| <i>Xuejiao Han ; Gabriela Hug</i>  |     |
| <b>STATE ESTIMATION OF LOW VOLTAGE DISTRIBUTION NETWORK WITH INTEGRATED CUSTOMER-OWNED PV AND STORAGE UNIT</b> .....   | 664 |
| <i>Motaz Ayiad ; Hugo Martins ; Onyema Nduka ; Bikash Pal</i>  |     |
| <b>FLICKER MITIGATION BY OPTIMIZATION OF VOLTAGE CONTROL</b> .....   | 670 |
| <i>Reinhold Bertram</i>  |     |
| <b>INFLUENCE OF POWER SYSTEM STABILIZERS ON HVDC CONTROL SYSTEMS IN AN ASYNCHRONOUS INTERCONNECTION POWER GRID</b> .....   | 676 |
| <i>Chunxiao Liu ; Wei Liu ; Qiang Zhang</i>  |     |
| <b>DATA CLASSIFICATION AND PARAMETER IDENTIFICATION IN POWER SYSTEMS BY MANIFOLD LEARNING</b> .....  | 682 |
| <i>Andrija T. Saric ; Mark K. Transtrum ; Aleksandar M. Stankovic</i>  |     |
| <b>AN EVENT-BASED WIDE AREA CONTROL SYSTEM USING INVERTERS OF PHOTOVOLTAIC GENERATION FOR IMPROVEMENT OF TRANSIENT STABILITY IN POWER SYSTEMS</b> .....            | 688 |
| <i>Kenichi Kawabe ; Toshiya Nanahara</i>   |     |
| <b>HARNESSING THE FLEXIBILITY OF ENERGY MANAGEMENT SYSTEMS: A RETAILER PERSPECTIVE</b> .....   | 694 |
| <i>Sébastien Mathieu ; Miguel Manuel De Villena ; Eric Vermeulen ; Damien Ernst</i>  |     |
| <b>A PIECE-WISE LINEARIZED TRANSFORMER WINDING MODEL FOR THE ANALYSIS OF INTERNAL VOLTAGE PROPAGATION</b> .....  | 700 |
| <i>Andreas Theocharis ; Marjan Popov</i>   |     |
| <b>A MODEL-INDEPENDENT DELAY COMPENSATION METHOD FOR POWER SYSTEMS</b> .....   | 706 |
| <i>Muyang Liu ; Georgios Tzounas ; Federico Milano</i>   |     |
| <b>FAULT DETECTION AND LOCALIZATION IN LV SMART GRIDS</b> .....  | 712 |
| <i>Nikolaos Sapountzoglou ; Bertrand Raison ; Nuno Silva</i>   |     |
| <b>ON THE SOLVABILITY OF STEADY-STATE LOAD FLOW PROBLEMS FOR MULTI-CARRIER ENERGY SYSTEMS</b> .....  | 718 |
| <i>Anne S. Markensteijn ; Kees Vuik ; Johan E. Romate</i>  |     |
| <b>SYSTEM VALUE FOR WIND FARMS PROVIDING FREQUENCY SERVICES UNDER DIFFERENT CONTROL FRAMEWORKS</b> .....   | 724 |
| <i>Vincenzo Trovato ; Maria Dicorato ; Giuseppe Forte ; Michele Trovato</i>  |     |
| <b>ENERGY DROOP CONTROL FOR MMC BASED MULTITERMINAL HVDC SYSTEMS</b> .....   | 730 |
| <i>Johannis Porst ; Matthias Luther ; Sven Baumann ; Christoph Hahn</i>  |     |
| <b>COMPARISON OF STOCHASTIC AND DETERMINISTIC SECURITY CONSTRAINED OPTIMAL POWER FLOW UNDER VARYING OUTAGE PROBABILITIES</b> .....                                 | 736 |
| <i>Elis Nycander ; Lennart Söder</i>   |     |

|  |     |
|--|-----|
| <b>CRITICAL MODEL PARAMETERS: A SECURITY VULNERABILITY IN ELECTRICITY MARKET OPERATION</b> .....   | 742 |
| <i>Yuzhang Lin ; Ali Abur ; Hanchen Xu</i>   |     |
| <b>ON FEASIBILITY AND FLEXIBILITY OPERATING REGIONS OF VIRTUAL POWER PLANTS AND TSO/DSO INTERFACES</b> .....   | 748 |
| <i>Shariq Riaz ; Pierluigi Mancarella</i>  |     |
| <b>PRIMARY FREQUENCY RESPONSE FROM OFFSHORE WIND FARMS CONNECTED TO HVDC VIA DIODE RECTIFIERS</b> .....  | 754 |
| <i>Oscar Saborío-Romano ; Ali Bidadfar ; Jayachandra N. Sakamuri ; Ömer Göksu ; Nicolaos A. Cutululis</i>  |     |
| <b>EFFECT OF INTERCONNECTION LINES ON THE VULNERABILITY OF POWER SYSTEMS</b> .....   | 760 |
| <i>Jesus Beyza ; Jose A. Dominguez-Navarro ; Jose M. Yusta</i>   |     |
| <b>GENERATIVE ADVERSARIAL MODEL-GUIDED DEEP ACTIVE LEARNING FOR VOLTAGE DIP LABELLING</b> .....  | 766 |
| <i>Azam Bagheri ; Irene Y. H. Gu ; Math H. J. Bollen</i>   |     |
| <b>LOAD IDENTIFICATION AND CLASSIFICATION OF ACTIVITIES OF DAILY LIVING USING RESIDENTIAL SMART METER DATA</b> .....   | 771 |
| <i>Michael A. Devlin ; Barry P. Hayes</i>  |     |
| <b>ADMM FOR TRANSACTIVE CONTROL OF MICROGRIDS</b> .....  | 777 |
| <i>Oscar I. Parra ; Joan Cruz ; Eduardo Mojica-Nava</i>  |     |
| <b>VALUE OF INJECTION FROM RESIDENTIAL PV WITH STORAGE FOR THE BULK POWER SYSTEM</b> .....   | 783 |
| <i>Sebastián Martín ; Juan Pérez-Ruiz ; Pablo López-Pérez</i>  |     |
| <b>BENEFIT ANALYSIS OF A HYBRID HVAC/HVDC TRANSMISSION LINE: A SWISS CASE STUDY</b> .....  | 789 |
| <i>Ognjen Stanojev ; Jared Garrison ; Sören Hedtke ; Christian M. Franck ; Turhan Demiray</i>  |     |
| <b>THREE-PHASE CURRENT-LIMITING DROOP CONTROLLED INVERTERS OPERATING IN PARALLEL</b> .....   | 795 |
| <i>Alexandros G. Paspatis ; George C. Konstantopoulos</i>  |     |
| <b>PLACEMENT OF VIRTUAL SYNCHRONOUS GENERATOR CONTROLLED ELECTRIC STORAGE COMBINED WITH RENEWABLE GENERATION</b> .....   | 801 |
| <i>Junru Chen ; Muyang Liu ; Federico Milano ; Terence O'Donnell</i>   |     |
| <b>LOW VOLTAGE GRID DATA VISUALISATION WITH A FRAME REPRESENTATION AND COGNITIVE ARCHITECTURE</b> .....  | 807 |
| <i>Mário Pereira ; Ricardo J. Bessa ; Clara Gowweia</i>  |     |
| <b>CONGESTION MANAGEMENT WITHIN A MULTI-SERVICE SCHEDULING COORDINATION SCHEME FOR LARGE BATTERY STORAGE SYSTEMS</b> .....   | 813 |
| <i>Clémentine Straub ; Jean Maeght ; Camille Pache ; Patrick Panciatoci ; Ram Rajagopal</i>  |     |
| <b>A JULIA MODULE FOR POLYNOMIAL OPTIMIZATION WITH COMPLEX VARIABLES APPLIED TO OPTIMAL POWER FLOW</b> .....   | 819 |
| <i>Julie Sliwak ; Manuel Ruiz ; Miguel F. Anjos ; Lucas Létocart ; Emiliano Traversi</i>   |     |
| <b>FEASIBLE OPERATION REGIONS OF ELECTRICITY-GAS INTEGRATED ENERGY DISTRIBUTION SYSTEM</b> .....   | 825 |
| <i>Liu Liu ; Dan Wang ; Zhengü Meng ; Hongüe Jia ; Weiliang Wang ; Menghua Fan</i>   |     |
| <b>DYNAMIC ANALYSIS OF THERMAL DEGRADATION OF BASIN-TYPE INSULATOR</b> .....   | 831 |
| <i>Hu Jin ; Ruihai Li ; Peng Ren ; Peng Peng ; Wei Zhang ; Yi Xiao ; Haoxi Cong ; Fucheng Wang</i>   |     |
| <b>PUMPED-STORAGE HYDROPOWER OPERATION SCHEDULING METHOD FOR NET LOAD RAMP LEVELING</b> .....  | 835 |
| <i>Ryuya Tanabe ; Akihiko Yokoyama</i>   |     |
| <b>ADAPTIVE GMM BASED TECHNIQUE FOR ONLINE HEALTH MONITORING OF THE PMU INSTRUMENTATION CHAIN</b> .....  | 841 |
| <i>Tabia Ahmad ; Nilanjan Senroy</i>   |     |
| <b>OSCILLATION DAMPING CONTROLLER DESIGN USING RINGDOWN MEASUREMENTS FOR THE ITALIAN POWER GRID</b> .....  | 847 |
| <i>Lin Zhu ; Yi Zhao ; Yilu Liu ; Evangelos Farantatos ; Mahendra Patel ; Papiya Dattaray ; Deepak Ramasubramanian ; Luigi Michi ; Enrico Carlini ; Giorgio Giannuzzi ; Roberto Zaottini</i> |     |
| <b>CHALLENGES AND OPPORTUNITIES FOR PHASOR DATA BASED EVENT DETECTION IN TRANSMISSION CONTROL CENTERS UNDER CYBER SECURITY CONSTRAINTS</b> .....   | 853 |
| <i>André Kummerow ; Dennis Rösch ; Cristian Monsalve ; Steffen Nicolai ; Peter Bretschneider ; Christoph Brosinsky ; Dirk Westermann</i>   |     |
| <b>FLEXIBILITY OPTIONS IDENTIFICATION WITHIN NET ZERO ENERGY FACTORIES</b> .....   | 859 |
| <i>P. Lombardi ; P. Komarnicki ; R. Zhu ; M. Liserre</i>   |     |
| <b>EXPERIMENTAL ANALYSIS OF GRID-FORMING FREQUENCY CONTROL STRATEGIES FOR LOAD SHARING IN LOW VOLTAGE ISLANDED MICROGRIDS</b> .....  | 865 |
| <i>Dominik Willenberg ; Niklas Mierau ; Sandor Simon ; Reinhold Bertram</i>  |     |
| <b>FAULT LOCATION DEPENDENCY OF SHORT-CIRCUIT CURRENTS IN MMC BASED MESHED HVDC CABLE SYSTEMS</b> .....  | 871 |
| <i>Anna Pfendler ; Andreas Saciak ; Jutta Hanson ; Gerd Balzer</i>   |     |
| <b>THE IMPACT OF ENERGY DISPATCH STRATEGY ON DESIGN OPTIMIZATION OF HYBRID RENEWABLE ENERGY SYSTEMS</b> .....  | 877 |
| <i>Kun Lee ; Dongsuk Kum</i>   |     |
| <b>TUNING OF AC VOLTAGE-CONTROLLED VSC BASED LINEAR QUADRATIC REGULATION</b> .....   | 883 |
| <i>Taufik Qoria ; Chuanyue Li ; Ko Oue ; François Gruson ; Frederic Colas ; Xavier Guillaud ; Thibault Prévost</i>   |     |



|   |      |
|---|------|
| <b>IDENTIFYING WASHING MACHINE CONSUMPTION IN SUPERVISED GLOBAL ELECTRIC CONSUMPTION</b> .....  | 889  |
| <i>Gilles Jacobs ; Jean Claude Maun</i>   |      |
| <b>A MALFUNCTION DETECTION METHOD FOR PV SYSTEMS</b> .....  | 895  |
| <i>Tuna Yıldız ; Murat Gol</i>  |      |
| <b>DEMAND SIDE FLEXIBILITY PROSPECTS IN MODERN LV NETWORKS: A PROBABILISTIC ASSESSMENT</b> .....  | 901  |
| <i>Iasonas I. Avramidis ; Vasileios A. Evangelopoulos ; Pavlos S. Georgilakis</i>   |      |
| <b>COMPREHENSIVE ANALYSIS OF CONSERVATION VOLTAGE REDUCTION: A REAL CASE STUDY</b> .....  | 907  |
| <i>Igor F. Visconti ; Delberis A. Lima ; Jovica V. Milanovic</i>  |      |
| <b>A GAME MODEL REFLECTING THE INTERACTION BETWEEN SUPPLY AND DEMAND OF POWER SYSTEM AND ITS Q LEARNING SOLUTION</b> .....                          | 913  |
| <i>Bin Wang ; Shiming Li ; Ruifeng Zhao ; Wenxin Guo ; Yueting Lin ; Kaiping Qu</i>   |      |
| <b>UTILIZATION OF HVDC-SYSTEMS IN THE INTERNATIONAL GRID CONTROL COOPERATION</b> .....  | 919  |
| <i>Arne Pawellek ; Lutz Hofmann</i>   |      |
| <b>RAMP ANALYSIS OF THE PORTUGUESE NET LOAD UNDER DIFFERENT DECARBONIZATION SCENARIO</b> .....  | 925  |
| <i>Jorge Dias De Magalhães ; José Villar</i>  |      |
| <b>THE ROLE OF ENERGY STORAGE SYSTEMS IN REDUCING EFFECT OF LOAD MODELS ON FREQUENCY DYNAMICS AND LARGE DISTURBANCE ROTOR ANGLE STABILITY</b> ..... | 931  |
| <i>Atia Adrees ; Yue Xing ; Jovica V. Milanovic</i>   |      |
| <b>EFFICIENT MONITOR PLACEMENT AND VOLTAGE SAG ESTIMATION USING SYSTEM IMPEDANCE MATRIX</b> .....   | 937  |
| <i>Araceli Hernández ; Jovica V. Milanovic</i>  |      |
| <b>REACTIVE POWER LOOP FLOWS IN TRANSMISSION GRIDS</b> .....  | 943  |
| <i>Markus Knittel ; Nils Namockel ; Maximilian Schneider ; Ralf Puffer</i>  |      |
| <b>AN OPTIMAL VIRTUAL POWER PLANT PLANNING STRATEGY FROM A COMPOSITE SYSTEM COST/WORTH PERSPECTIVE</b> .....  | 949  |
| <i>Arijit Bagchi ; Lalit Goel ; Peng Wang</i>   |      |
| <b>DISTRIBUTION GRID STATE ASSESSMENT FOR CONTROL RESERVE PROVISION USING BOUNDARY LOAD FLOW</b> .....  | 955  |
| <i>Volker Scheffer ; Hanko Ipach ; Christian Becker</i>   |      |
| <b>COMPARISON OF MPC FORMULATIONS FOR BUILDING CONTROL UNDER COMMERCIAL TIME-OF-USE TARIFFS</b> .....   | 961  |
| <i>Olivier Van Cutsem ; Maher Kayal ; David Blum ; Marco Pritoni</i>  |      |
| <b>COMPARISON OF A NON-PARAMETRIC AND PARAMETRIC METHOD FOR INTERHARMONIC ESTIMATION IN PV SYSTEMS</b> .....  | 967  |
| <i>Vineetha Ravindran ; Tatiano Busatto ; Sarah K. Rönnerberg ; Math H. J. Bollen</i>   |      |
| <b>UNIT COMMITMENT WITH ACOF CONSTRAINTS: PRACTICAL EXPERIENCE WITH SOLUTION TECHNIQUES</b> .....   | 973  |
| <i>Diego A. Tejada-Arango ; Sonja Wogrin ; Pedro Sánchez-Martin ; Andres Ramos</i>  |      |
| <b>SIZING AND OPERATION OF AN ISOLATED MICROGRID WITH COLD STORAGE</b> .....  | 979  |
| <i>Selmane Dakir ; Ioannis Boukas ; Vincent Lemort ; Bertrand Cornélusse</i>  |      |
| <b>HOW AND WHY THE BATTERIES IN THE SECTORS OF PHOTOVOLTAICS AND ELECTRIC VEHICLES COULD HAVE IMPACT ON THE SOCIETY</b> .....                       | 985  |
| <i>Suad S. Halilcevic ; Pavlos S. Georgilakis</i>   |      |
| <b>CLUSTERING-BASED DISCRIMINATION OF MULTIPLE PARTIAL DISCHARGE SOURCES: A CASE STUDY</b> .....  | 991  |
| <i>Mauro Palo ; Benjamin Schubert ; Jianguo Wei ; Weilin Liu</i>  |      |
| <b>OPTIMAL DAY-AHEAD ENERGY AND RESERVE BIDDING STRATEGY OF A RISK-AVERSE ELECTRIC VEHICLE AGGREGATOR IN THE NORDIC MARKET</b> .....                | 997  |
| <i>Lars Herre ; Jacob Dalton ; Lennart Söder</i>  |      |
| <b>VALUE OF THERMOSTATIC LOADS IN ENERGYFFREQUENCY RESPONSE MARKETS: A MEAN FIELD GAME APPROACH</b> .....   | 1003 |
| <i>Antonio De Paola ; Vincenzo Trovato ; David Angeli ; Goran Strbac</i>  |      |
| <b>DISTRIBUTED ENERGY STORAGE AGGREGATION, QUANTITATIVE EVALUATION OF REPLICABILITY AND SCALABILITY</b> .....                                       | 1009 |
| <i>Andrea Michiorri</i>   |      |
| <b>OPTIMISING LOAD FLEXIBILITY FOR THE DAY AHEAD IN DISTRIBUTION NETWORKS WITH PHOTOVOLTAICS</b> .....  | 1014 |
| <i>Jose Angel Velasco ; Valentin Rigoni ; Alireza Soroudi ; Andrew Keane ; Hortensia Amaris</i>   |      |
| <b>CONVERSION OF BALANCING ENERGY OFFERS FROM GENERATING, DEMAND RESPONSE AND ENERGY STORAGE RESOURCES</b> .....                                    | 1020 |
| <i>I. G. Marnieris ; C. G. Roumpos ; P. N. Biskas ; A. G. Bakirtzis</i>   |      |
| <b>IDENTIFYING THE CLASS OF DISTURBANCE EVENTS USING RECURRENCE QUANTIFICATION ANALYSIS</b> .....   | 1026 |
| <i>Mahmoodreza Arefi ; Badrul H. Chowdhury</i>  |      |
| <b>AN APPLICATION OF MACHINE LEARNING FOR A SMART GRID RESOURCE ALLOCATION PROBLEM</b> .....  | 1032 |
| <i>Yingying Zheng ; Siddharth Suryanarayanan ; Anthony A. Maciejewski ; Howard Jay Siegel ; Timothy M. Hansen ; Berk Celik</i>                      |      |

|   |      |
|---|------|
| <b>PERFORMANCE EVALUATION OF STATCOM EQUIPMENT USING AMBIENT AND DISTURBANCE DATA</b> .....   | 1038 |
| <i>Christoph Lackner ; Joe H. Chow ; Felipe Wilches-Bernal</i>  |      |
| <b>OPTIMAL ADJUSTMENTS ON THE MARKET DISPATCH SOLUTION TO SUPPLY SYSTEM LOSSES</b> .....  | 1043 |
| <i>Rafael Zárate-Miñano ; Miguel Carrión</i>  |      |
| <b>CASCADING OUTAGE ASSESSMENT USING THÉVENIN EQUIVALENT STATIC CONTINGENCY ASSESSMENT</b> .....  | 1048 |
| <i>Pauli Friðheim Petersen ; Christian Oxholm ; Jakob Glarbo Møller ; Hjörtur Jóhannsson</i>  |      |
| <b>IMPROVED MULTI-OBJECTIVE EVOLUTIONARY ALGORITHM IN SUBPOPULATION TABLES WITH FEATURES FROM NSGA-II FOR THE SERVICE RESTORATION PROBLEM</b> .....                         | 1054 |
| <i>Leandro Tolomeu Marques ; José Paulo Ramos Fernandes ; João Bosco Augusto London</i>   |      |
| <b>OPTIMAL ENERGY MANAGEMENT OF ALL-ELECTRIC RESIDENTIAL ENERGY SYSTEMS IN THE NETHERLANDS</b> .....  | 1059 |
| <i>Tom Terlouw ; Tarek Alskaf ; Wilfried Van Sark</i>   |      |
| <b>ENHANCEMENT OF TRANSIENT STABILITY IN POWER SYSTEMS WITH HIGH PENETRATION LEVEL OF WIND POWER PLANTS</b> .....   | 1065 |
| <i>D. Wang ; J. L. Rueda Torres ; A. Perilla ; E. Rakhshani ; P. Palensky ; M. A. A. M. Van Der Meijden</i>   |      |
| <b>EXPLANATORY AND CAUSAL ANALYSIS OF THE MIBEL ELECTRICITY MARKET SPOT PRICE</b> .....   | 1071 |
| <i>Carla Gonçalves ; Miguel Ribeiro ; João Viana ; Renato Fernandes ; José Villar ; Ricardo Bessa ; Gonçalo Correia ; José Sousa ; Virgílio Mendes ; Ana Cristina Nunes</i> |      |
| <b>A NOVEL MODEL RECOGNITION -BASED CURRENT DIFFERENTIAL PROTECTION IN TIME-DOMAIN</b> .....  | 1077 |
| <i>Kaiqi Ma ; Zhe Chen ; Claus Leth Bak ; Zhou Liu</i>  |      |
| <b>LOCAL ENERGY MARKETS IN LV NETWORKS: COMMUNITY BASED AND DECENTRALIZED P2P APPROACHES</b> .....  | 1083 |
| <i>Jaysson Guerrero ; Archie C. Chapman ; Gregor Verbic</i>   |      |
| <b>A HYBRID APPROACH FOR SHORT-TERM PV POWER FORECASTING IN PREDICTIVE CONTROL APPLICATIONS</b> .....   | 1089 |
| <i>Evangelos Vrettos ; Christoph Gehbauer</i>   |      |
| <b>DETAILED VS. AGGREGATE WIND FARM REPRESENTATION FOR TRANSMISSION SYSTEM VOLTAGE STABILITY SUPPORT</b> .....  | 1095 |
| <i>Theodoros Souxes ; Aristeidis Parasidis ; Costas Vournas</i>   |      |
| <b>MODELING OF DISTRIBUTED ENERGY RESOURCES FOR SIMULATING FAULT-INITIATED ISLANDING OF MICROGRIDS</b> .....  | 1101 |
| <i>M. H. Roos ; P. H. Nguyen ; J. Morren ; J. G. Slootweg</i>   |      |
| <b>ASSESSING THE IMPACT OF OFFSHORE WIND FARM GRID CONFIGURATION ON HARMONIC STABILITY</b> .....  | 1107 |
| <i>Matthias Quester ; Viswaja Yelliseti ; Fismik Loku ; Ralf Puffer</i>   |      |
| <b>OPERATION OF AUTOMATIC TRANSFER SWITCHES IN THE NETWORKS WITH DISTRIBUTED GENERATION</b> .....   | 1113 |
| <i>Pavel Ilyushin ; Konstantin Suslov</i>   |      |
| <b>STOCHASTIC OPERATION SCHEDULING MODEL FOR A SWEDISH PROSUMER WITH PV AND BESS IN NORDIC DAY-AHEAD ELECTRICITY MARKET</b> .....   | 1119 |
| <i>Christos Agathokleous ; Le Anh Tuan ; David Steen</i>  |      |
| <b>ANALYSIS OF THE INTEGRATION OF TYPE C WIND TURBINES IN DISTRIBUTION NETWORKS</b> .....   | 1125 |
| <i>Fernando Ribeiro Arduini ; André Luís Da Silva Pessoa ; Mário Oleskovicz ; Eduardo Nobuhiro Asada</i>  |      |
| <b>SIMULATION APPROACH TO INTEGRATED ENERGY SYSTEMS STUDY BASED ON ENERGY HUB CONCEPT</b> .....   | 1131 |
| <i>Nikolai Voropai ; Ekaterina Ukolova ; Dmitry Gerasimov ; Konstantin Suslov ; Pio Lombardi ; Przemyslaw Komarnicki</i>  |      |
| <b>SECONDARY HARMONIC EMISSION IN WIND POWER PLANTS</b> .....   | 1136 |
| <i>Daphne Schwanz ; Math Bollen ; Anders Larsson</i>  |      |
| <b>DYNAMIC SYNCHROPHASOR ESTIMATION ALGORITHM FOR P-CLASS PHASOR MEASUREMENT UNITS</b> .....  | 1142 |
| <i>Lei Chen ; Wei Zhao ; Fuping Wang ; Yiqing Yu ; Songling Huang</i>   |      |
| <b>THE ROLE OF NUCLEAR POWER PLANTS IN ELECTRICITY SYSTEMS WITH HIGH RES SHARE</b> .....  | 1148 |
| <i>Timo Gerres ; José Pablo Chaves Ávila ; Francisco Martín Martínez ; Michel Rivier Abbad ; Tomás Gómez San Román</i>  |      |
| <b>FREQUENCY-DOMAIN MODELING OF NONLINEAR POWER SYSTEM DEVICES: THE QUASI-SINUSOIDAL VOLTERRA APPROACH</b> .....  | 1154 |
| <i>Christian Laurano ; Sergio Toscani ; Michele Zanoni</i>  |      |
| <b>DATA-DRIVEN EVENT ASSESSMENT IN POWER SYSTEMS USING GAUSSIAN MIXTURE MODELS</b> .....  | 1160 |
| <i>Sirin Dutta Chowdhur ; Nilanjan Senroy ; Swades De</i>   |      |
| <b>IMPACT ANALYSIS OF V2G SERVICES ON EV BATTERY DEGRADATION - A REVIEW</b> .....   | 1166 |
| <i>Jingli Guo ; Jin Yang ; Zhengyu Lin ; Clara Serrano ; Ana Maria Cortes</i>   |      |
| <b>ESTIMATING THE OPTION VALUE OF GRID-SCALE BATTERY SYSTEMS TO DISTRIBUTION NETWORK SERVICE PROVIDERS</b> .....  | 1172 |
| <i>Yiju Ma ; Gregor Verbic ; Archie C. Chapman</i>  |      |
| <b>CONSENSUS-BASED DISTRIBUTED CONTROL FOR OVERVOLTAGE MITIGATION IN LV MICROGRIDS</b> .....  | 1178 |
| <i>T. T. Mai ; A. N. M. M. Haque ; P. H. Nguyen</i>   |      |
| <b>PROTECTION OF DISTRIBUTION SYSTEM ISLANDS FED BY INVERTER-INTERFACED SOURCES</b> .....   | 1184 |
| <i>Sukumar Brahma</i>   |      |

|   |      |
|---|------|
| <b>COMPARATIVE STUDY BETWEEN SINGLE-OBJECTIVE AND MULTI-OBJECTIVE OPTIMIZATION APPROACHES FOR DIRECTIONAL OVERCURRENT RELAYS COORDINATION CONSIDERING DIFFERENT FAULT LOCATIONS</b> ..... | 1190 |
| <i>M. K. Afifi ; H. M. Sharaf ; M. M. Sayed ; D. K. Ibrahim</i>   |      |
| <b>PROTECTION ISSUES IN DC TRACTION SYSTEM WITH REGENERATIVE BRAKING</b> .....  | 1196 |
| <i>Morris Brenna ; Federica Foiadelli ; Carola Leone ; Michela Longo</i>  |      |
| <b>A REAL-TIME HARDWARE-IN-THE-LOOP TEST BENCH FOR MODULAR MULTILEVEL CONVERTER WITH ENERGY BASED CONTROL</b> .....   | 1201 |
| <i>Haibo Zhang ; Mohamed Moez Belhaouane ; Frédéric Colas ; Riad Kadri ; François Gruson ; Xavier Guillaud</i>  |      |
| <b>SHAPLEY VALUE ANALYSIS OF DISTRIBUTION NETWORK COST-CAUSALITY PRICING</b> .....  | 1207 |
| <i>Donald Azuatalam ; Archie C. Chapman ; Gregor Verbic</i>   |      |
| <b>IMPACT OF LOAD UNBALANCE ON LOW VOLTAGE NETWORK LOSSES</b> .....   | 1213 |
| <i>J. Nuno Fidalgo ; Carlos Moreira ; Rafael Cavalheiro</i>   |      |
| <b>OPTIMAL ADAPTIVE POWER FLOW LINEARIZATIONS: EXPECTED ERROR MINIMIZATION USING POLYNOMIAL CHAOS EXPANSION</b> .....   | 1218 |
| <i>Tillmann Mühlpfordt ; Veit Hagenmeyer ; Daniel K. Molzahn ; Sidhant Misra</i>  |      |
| <b>A FRAMEWORK FOR THE INTEGRATION OF ICT-RELEVANT DATA IN POWER SYSTEM APPLICATIONS</b> .....  | 1224 |
| <i>Michael Brand ; Shoaib Ansari ; Felipe Castro ; Ranim Chakra ; Batoul Hage Hassan ; Carsten Krüger ; Davood Babazadeh ; Sebastian Lehnhoff</i>   |      |
| <b>EFFICIENT MANAGEMENT OF DEMAND IN A POWER DISTRIBUTION SYSTEM WITH SMART METER DATA</b> .....  | 1230 |
| <i>Zafar A. Khan ; Dilan Jayaweera</i>  |      |
| <b>INTEGRATED GRID PLANNING MODEL WITH HIGH DISTRIBUTED SOLAR PV</b> .....  | 1236 |
| <i>Syahrul Nizam Md Saad ; Adriaan Hendrik Van Der Weijde</i>   |      |
| <b>SOFT COMPUTING TECHNIQUES FOR DESIGNING OF ADAPTIVE POWER SYSTEM STABILIZER</b> .....  | 1242 |
| <i>P. R. Gandhi ; S. K. Joshi</i>   |      |
| <b>APPROACHES TO OBTAIN USABLE SOLUTIONS FOR INFEASIBLE SECURITY-CONSTRAINED OPTIMAL POWER FLOW PROBLEMS DUE TO CONFLICTING CONTINGENCIES</b> .....                                       | 1248 |
| <i>Florin Capitanescu</i>   |      |
| <b>APPROXIMATION OF CURRENT CONTRIBUTION BY CONVERTERS WITH DC FAULT RIDE-THROUGH CAPABILITY FOR SHORT CIRCUIT CURRENT CALCULATION OF DC DISTRIBUTION GRIDS</b> .....                     | 1254 |
| <i>Raphael Bleilevens ; Alexander M. Jaschek ; Albert Moser</i>   |      |
| <b>A DSO-LEVEL CONTRACT MARKET FOR CONDITIONAL DEMAND RESPONSE</b> .....  | 1260 |
| <i>Corey Kok ; Jalal Kazempour ; Pierre Pinson</i>  |      |
| <b>INITIAL STUDY OF THE POWER SYSTEM STABILITY BOUNDARY ESTIMATED FROM NONLINEAR MODAL DECOUPLING</b> .....   | 1266 |
| <i>Xin Xu ; Bin Wang ; Kai Sun</i>  |      |
| <b>DYNAMIC AVERAGE CONVERTER MODEL FOR MVDC LINK HARMONIC ANALYSIS</b> .....  | 1271 |
| <i>Tibin Joseph ; Senthooan Balasubramaniam ; Gen Li ; Jun Liang ; Wenlong Ming ; Andrew Moon ; Kevin Smith ; James Yu</i>  |      |
| <b>STATIC VS DYNAMIC FRR SIZING FOR POWER SYSTEMS WITH INCREASING AMOUNTS OF RENEWABLES</b> .....   | 1277 |
| <i>M.-L. Cauwet ; E. Karangelos ; L. Wehenkel ; B. Georis</i>   |      |
| <b>ENERGY HUB MODELLING FOR MULTI-SCALE AND MULTI-ENERGY SUPPLY SYSTEMS</b> .....   | 1283 |
| <i>Lahiru Jayasuriya ; Modassar Chaudry ; Meysam Qadrdan ; Jianzhong Wu ; Nick Jenkins</i>  |      |
| <b>INTRUSION DETECTION IN SMART GRID MEASUREMENT INFRASTRUCTURES BASED ON PRINCIPAL COMPONENT ANALYSIS</b> .....  | 1289 |
| <i>Elisabeth Drayer ; Tirza Routtenberg</i>   |      |
| <b>RELIABLE DATA COMMUNICATIONS DEVICE CONFIGURATION USING IEC61850</b> .....   | 1295 |
| <i>John O'Raw ; David M. Lavery ; D. John Morrow</i>  |      |
| <b>MODELLING AND SIMULATION OF HYBRID PV &amp; BES SYSTEMS AS FLEXIBLE RESOURCES IN SMARTGRIDS – SUNDOM SMART GRID CASE</b> .....   | 1300 |
| <i>Chethan Parthasarathy ; Hossein Hafezi ; Hannu Laaksonen ; Kimmo Kauhaniemi</i>  |      |
| <b>ON-LINE VOLTAGE INSTABILITY PREDICTION USING AN ARTIFICIAL NEURAL NETWORK</b> .....  | 1306 |
| <i>Hannes Hagmar ; Le Anh Tuan ; Ola Carlson ; Robert Eriksson</i>  |      |
| <b>ON THE USE OF THERMOSTATICALLY CONTROLLED LOADS FOR FREQUENCY CONTROL</b> .....  | 1312 |
| <i>Maksim Parshin ; Maryam Majidi ; Federico Ibanez ; David Pozo</i>  |      |
| <b>ALLOCATION OF ACTIVE POWER RESERVE FROM ACTIVE DISTRIBUTION NETWORKS USING A COST-BENEFIT APPROACH: APPLICATION TO SWISSGRID NETWORK</b> .....   | 1318 |
| <i>Mohsen Kalantar-Neyestanaki ; Mokhtar Bozorg ; Fabrizio Sossan ; Rachid Cherkaoui</i>  |      |
| <b>QUANTIFICATION AND VERIFICATION OF RESIDENTIAL BATTERY RESPONSE FOR FREQUENCY REGULATION IN PV-RICH POWER SYSTEMS</b> .....  | 1324 |
| <i>Dillon Jaglal ; William J. Nacmanson ; Luis F. Ochoa</i>   |      |
| <b>CENTRALIZED AND DISTRIBUTED BATTERY ENERGY STORAGE SYSTEM FOR PEAK LOAD DEMAND SUPPORT OF RADIAL DISTRIBUTION NETWORKS</b> .....   | 1330 |
| <i>Shubh Lakshmi ; Sanjib Ganguly</i>   |      |
| <b>OPERATION MODE TRANSITIONS IN THE KINETIC BATTERY MODEL</b> .....  | 1336 |
| <i>Paul Dicke ; Reinhard German ; Frank Steinbacher ; Barbara Schrickler</i>  |      |

|   |      |
|---|------|
| <b>TRANSMISSION EXPANSION PLANNING CONSIDERING DETAILED MODELING OF EXPANSION COSTS</b> .....   | 1342 |
| <i>Marco Franken ; Hans Barrios ; Alexander B. Schrief ; Ralf Puffer</i>  |      |
| <b>CENTRALIZED WIDE AREA DAMPING CONTROLLER FOR POWER SYSTEM OSCILLATION PROBLEMS</b> .....   | 1348 |
| <i>Jean Dobrowolski ; Petr Korba ; Felix Rafael Segundo Sevilla ; Walter Sattingert</i>   |      |
| <b>DYNAMIC RESISTANCE MEASUREMENTS AND RESULT INTERPRETATION FOR VARIOUS ON-LOAD TAP CHANGERS</b> .....                                   | 1354 |
| <i>A. Boricic ; D. Laban ; B. Moedim ; A. Conde Lopez ; B. Molinari ; Z. Riaz ; Roya Nikjoo</i>   |      |
| <b>A FRAMEWORK FOR DYNAMIC SECURITY ASSESSMENT OF COMBINED MULTI-TERMINAL HVDC AND AC GRIDS</b> .....                                     | 1360 |
| <i>Lampros Papangelis ; Mevludin Glavic ; Thierry Van Cutsem</i>  |      |
| <b>NONCOMMUNICATION ACCELERATED SEQUENTIAL TRIPPING FOR REMOTE-END FAULTS ON TRANSMISSION LINES</b> .....                                 | 1366 |
| <i>Sadegh Azizi ; Mingyu Sun ; Vladimir Terzija ; Marjan Popov</i>  |      |
| <b>DYNAMIC EQUIVALENT OF AN ACTIVE DISTRIBUTION NETWORK TAKING INTO ACCOUNT MODEL UNCERTAINTIES</b> .....                                 | 1372 |
| <i>Gilles Chaspierre ; Guillaume Denis ; Patrick Panciatici ; Thierry Van Cutsem</i>  |      |
| <b>DATA-DRIVEN FEATURE DESCRIPTION OF HEAT WAVE EFFECT ON DISTRIBUTION SYSTEM</b> .....   | 1378 |
| <i>Yang Zhang ; Andrea Mazza ; Ettore Bompard ; Emiliano Roggero ; Giuliana Galofaro</i>  |      |
| <b>SYNCHRONOUS MACHINE REPRESENTATIONS FOR STABILITY STUDIES OF POWER SYSTEMS WITH INVERTERS</b> .....                                    | 1384 |
| <i>Guilherme S. Pereira ; Valentin Costan ; Antoine Bruyère ; Xavier Guillaud</i>   |      |
| <b>IMPACT OF VSC-HVDC REACTIVE POWER CONTROL SCHEMES ON VOLTAGE STABILITY</b> .....   | 1390 |
| <i>Josep Oriol Bernat ; Robin Preece</i>  |      |
| <b>SMART METER PRIVACY CONTROL STRATEGY INCLUDING ENERGY STORAGE DEGRADATION</b> .....  | 1396 |
| <i>Ramana R. Avula ; Tobias J. Oechtering ; Jun-Xing Chin ; Gabriela Hug</i>  |      |
| <b>ASSESSMENT OF REAL-TIME TARIFFS FOR ELECTRIC VEHICLES IN DENMARK</b> .....   | 1402 |
| <i>T. Soares ; C. Fonseca ; H. Morais ; S. Ramos ; T. Sousa</i>   |      |
| <b>IMPROVEMENT OF SELF-SUFFICIENCY FOR AN INNOVATIVE NEARLY ZERO ENERGY BUILDING BY PHOTOVOLTAIC GENERATORS</b> .....                     | 1408 |
| <i>Paolo Di Leo ; Filippo Spertino ; Stefania Fichera ; Gabriele Malgaroli ; Alessandro Ratclif</i>                                       |      |
| <b>STOCHASTIC ENERGY AND RESERVE MARKET IN A MICROGRID ENVIRONMENT</b> .....  | 1414 |
| <i>Diogo Castro ; Tiago Soares ; Manuel Matos</i>   |      |
| <b>REINFORCEMENT LEARNING FOR CYBER-PHYSICAL SECURITY ASSESSMENT OF POWER SYSTEMS</b> .....   | 1420 |
| <i>Xiaorui Liu ; Charalambos Konstantinou</i>   |      |
| <b>OPERATING POWER GRIDS DURING NATURAL DISASTERS</b> .....   | 1426 |
| <i>Ahmet Öner ; Ali Abur</i>  |      |
| <b>ROBUST STATE ESTIMATION USING NODE-BREAKER SUBSTATION MODELS AND PHASOR MEASUREMENTS</b> .....   | 1432 |
| <i>Bilgehan Donmez ; Gianna Scioletti ; Ali Abur</i>  |      |
| <b>EVALUATING INTERNAL RESONANCES IN POWER TRANSFORMERS BY USING INSTRUMENTAL VARIABLE VECTOR FITTING</b> .....                           | 1438 |
| <i>Lucas F. M. Rodrigues ; Ricardo Schumacher ; Gustavo H. C. Oliveira ; Angélica C. O. Rocha ; Diogo J. D. E. Santo</i>                  |      |
| <b>MULTIOBJECTIVE HOME APPLIANCES SCHEDULING CONSIDERING CUSTOMER THERMAL DISCOMFORT: A MULTISTEP LOOK-AHEAD ADP-BASED APPROACH</b> ..... | 1444 |
| <i>Babak Jeedi ; Yateendra Mishra ; Gerard Ledwich</i>  |      |
| <b>MODELLING AND TRANSIENT STABILITY ANALYSIS OF INTERCONNECTED AUTONOMOUS HYBRID MICROGRIDS</b> .....                                    | 1450 |
| <i>Kishan Veerashekar ; Stefan Eichner ; Matthias Luther</i>  |      |
| <b>BEHAVIOUR ANALYSIS OF ELECTRICAL VEHICLE FLEXIBILITY BASED ON LARGE-SCALE CHARGING DATA</b> .....                                      | 1456 |
| <i>Poria Hasanpor Divshali ; Corentin Evens</i>   |      |
| <b>NEW SYNCHRONOUS CONDENSER – FLYWHEEL SYSTEMS FOR A DECARBONIZED SARDINIAN POWER SYSTEM</b> .....                                       | 1462 |
| <i>F. Palone ; F. M. Gatta ; A. Geri ; S. Lauria ; M. Maccioni</i>  |      |
| <b>VOLTAGE SUPPORT SCHEME FOR LOW VOLTAGE DISTRIBUTION GRIDS UNDER VOLTAGE SAGS</b> .....   | 1468 |
| <i>Anastasis Charalambous ; Lenos Hadjidemetriou ; Elias Kyriakides</i>   |      |
| <b>THE NOVEL METHOD FOR VOLTAGE TRANSIENT DETECTION AND CHARACTERIZATION</b> .....  | 1474 |
| <i>Azam Bagheri ; Math H. J. Bollen</i>   |      |
| <b>ROBUST CONVERTER CONTROL DESIGN UNDER TIME-DELAY UNCERTAINTY</b> .....   | 1480 |
| <i>David Rodriguez Flores ; Uros Markovic ; Petros Aristidou ; Gabriela Hug</i>   |      |
| <b>IMPLICATIONS OF POWER-TO-HEAT ON TRANSMISSION EXPANSION NEEDS: A REAL LIFE CASE STUDY</b> .....  | 1486 |
| <i>Ankita S. Gaur ; Desta Z. Fitiwi ; John Curis</i>  |      |
| <b>ON THE METHODS OF RESONANCE IDENTIFICATION IN POWER SYSTEMS</b> .....  | 1492 |
| <i>Amir Arasteh ; Ömer Göksu ; Jayachandra Naidu Sakamuri ; Nicolaos A. Cutululis</i>   |      |

|   |      |
|---|------|
| <b>COMPARISON AMONG DETERMINISTIC METHODS TO DESIGN RURAL MINI-GRIDS: EFFECT OF OPERATING STRATEGIES</b> .....  | 1498 |
| <i>Davide Fioriti ; Davide Poli ; Paolo Cherubini ; Giovanni Lutzenberger ; Andrea Micangeli ; Pablo Duenas-Martinez</i>                                  |      |
| <b>EMD AND MCSA IMPROVED VIA HILBERT TRANSFORM ANALYSIS ON ASYNCHRONOUS MACHINES FOR BROKEN BAR DETECTION USING VIBRATION ANALYSIS</b> .....              | 1504 |
| <i>A. E. Treml ; R. A. Flauzino ; G. C. Brito</i>   |      |
| <b>EVALUATION OF AUTOMATIC POWER QUALITY CLASSIFICATION IN MICROGRIDS OPERATING IN ISLANDED MODE</b> .....  | 1510 |
| <i>Raul Igual ; Carlos Medrano ; Franz Schubert</i>   |      |
| <b>A COMPARATIVE ANALYSIS OF LU DECOMPOSITION METHODS FOR POWER SYSTEM SIMULATIONS</b> .....  | 1516 |
| <i>Lukas Razik ; Lennart Schumacher ; Antonello Monti ; Adrien Guironnet ; Gautier Bureau</i>   |      |
| <b>A REST BASED CO-SIMULATION INTERFACE FOR DISTRIBUTED SIMULATIONS</b> .....   | 1522 |
| <i>Mike Vogt ; Frank Marten ; Juan Montoya ; Christian Töbermann ; Martin Brauns</i>  |      |
| <b>EFFICIENT ISOMORPHISM BASED SIMULATION OF MODULAR MULTILEVEL CONVERTERS</b> .....  | 1528 |
| <i>Davide Del Giudice ; Federico Bizzarri ; Daniele Linaro ; Angelo Brambilla</i>   |      |
| <b>MODELLING LONG-TERM ELECTRICITY LOAD DEMAND FOR RURAL ELECTRIFICATION PLANNING</b> .....   | 1533 |
| <i>Fabio Riva ; Francesco Davide Savito ; Francesco Tonini Tonini ; Emanuela Colombo ; Fabrizio Colombelli</i>  |      |
| <b>ACCOMMODATING BOUNDED RATIONALITY IN PRICING DEMAND RESPONSE</b> .....   | 1539 |
| <i>Andrea Marin Radoszynski ; Vladimir Dvorkin ; Pierre Pinson</i>  |      |
| <b>FINDING UNSTABLE OPERATING POINTS VIA ONE-DIMENSIONAL MANIFOLDS</b> .....  | 1545 |
| <i>Jonathan E. Sarmiento ; Cristian A. Alvez ; B. Nadai De N ; João Alves Da Silva Neto ; A. C. Zambroni De Souza ; B. I. L. Lopes ; Paulo F. Ribeiro</i> |      |
| <b>ADRC FOR DECENTRALIZED LOAD FREQUENCY CONTROL WITH RENEWABLE ENERGY GENERATION</b> .....   | 1550 |
| <i>Sergio A. Dorado-Rojas ; John Cortés-Romero ; Sergio Rivera ; Eduardo Mojica-Nava</i>  |      |
| <b>TRACKING TRANSMISSION LINE PARAMETERS IN POWER GRIDS OBSERVED BY PMUS</b> .....  | 1556 |
| <i>Pengxiang Ren ; Ali Abur ; Hanoch Lev-Ari</i>  |      |
| <b>ESTIMATING TRANSIENT STABILITY MARGIN REGARDING A DOMINANT OSCILLATION MODE</b> .....  | 1562 |
| <i>Wenyun Ju ; Bin Wang ; Kai Sun</i>   |      |
| <b>ENERGY MANAGEMENT MODELLING UNDER REAL-TIME APPROACH</b> .....   | 1567 |
| <i>Irina Oleinikova ; Anna Mutule ; Ivars Zikmanis ; Ervin Grebesh</i>  |      |
| <b>PROPOSAL FOR MODELING ELECTRIC VEHICLE BATTERY USING EXPERIMENTAL DATA AND CONSIDERING TEMPERATURE EFFECTS</b> .....                                   | 1572 |
| <i>Juan D. Valladolid ; Diego Patiño ; Juan P. Ortiz ; Ismael Minchala ; Giambattista Gruosso</i>   |      |
| <b>MODELLING OF THE PEM FUEL CELL AND DESIGN OF A CLOSED LOOP CONTROL BASED DC-DC BOOST CONVERTER FOR LOCOMOTIVE APPLICATION</b> .....                    | 1578 |
| <i>Upasana Sarma ; Sanjib Ganguly</i>   |      |
| <b>ENERGY STORAGE SIZING AND RELIABILITY ASSESSMENT FOR POWER SYSTEMS WITH VARIABLE GENERATION</b> .....  | 1584 |
| <i>Abdullah Alamri ; Maad Alowaijeer ; A. P. S. Meliopoulos ; George J. Cokkinides</i>  |      |
| <b>MIXED INTEGER QUADRATIC PROGRAMMING RECEDING HORIZON MICROGRID SUPERVISOR</b> .....  | 1590 |
| <i>M. Legry ; F. Colas ; C. Sautemont ; J. Y. Dieulot ; O. Ducarme</i>  |      |
| <b>ON STORED ENERGY REQUIREMENT IN THE ALTERNATE ARM CONVERTER</b> .....  | 1596 |
| <i>Pierre Vermeersch ; Francois Gruson ; Xavier Guillaud ; Philippe Egrot ; Michaël M. C. Merlin</i>  |      |
| <b>MULTI-VECTOR ENERGY OPTIMIZATION TOOLS FOR ENERGY ISLANDS</b> .....  | 1602 |
| <i>Sanket Puranik ; Heidi Tuiskula ; Iliana Ilieva ; Ferran Torrent ; Joan Colomer ; Joaquim Meléndez</i>   |      |
| <b>AN ADVANCED TOOL FOR DATA ANALYSIS OF ENERGY MANAGEMENT SYSTEM CALCULATIONS</b> .....  | 1608 |
| <i>Domagoj Peharda ; Igor Ivankovic ; Renata Rubeša</i>   |      |
| <b>DYNAMIC BEHAVIOR OF CONVENTIONAL AND STORAGE POWER PLANTS IN A SINGLE POWER SYSTEM</b> .....   | 1613 |
| <i>Harald Weber ; Nayeemuddin Ahmed ; Martin Töpfer ; Paul Gerdun ; Vinaykumar Vernekar</i>   |      |
| <b>PRE-FEASIBILITY TECHNO-ECONOMIC COMPARISON OF RURAL ELECTRIFICATION OPTIONS: EXPLOITATION OF PV AND WIND</b> .....                                     | 1619 |
| <i>Fabio Scazzosi ; Stefano Mandelli ; Alessandro Bertani ; Matteo Moncecchi ; Marco Merlo</i>  |      |
| <b>A HYBRID ROBUST-STOCHASTIC APPROACH FOR THE DAY-AHEAD SCHEDULING OF AN EV AGGREGATOR</b> .....   | 1625 |
| <i>S. Minniti ; A. N. M. M. Haque ; N. G. Paterakis ; P. H. Nguyen</i>  |      |
| <b>RELIABILITY IMPROVEMENT OF DISTRIBUTION SYSTEM THROUGH DISTRIBUTION SYSTEM PLANNING: MILP VS. GA</b> .....   | 1631 |
| <i>Sanja Duvnjak Žarkovic ; Stefan Stankovic ; Ebrahim Shayesteh ; Patrik Hilber</i>  |      |
| <b>SMART MAINTENANCE MODEL FOR OPERATIONAL PLANNING OF STATIC SYNCHRONOUS COMPENSATORS</b> .....  | 1637 |
| <i>Manuel S. Alvarez-Alvarado ; Dilan Jayaweera</i>   |      |
| <b>MODELING OF HARMONIC PROPAGATION OF FAST DC EV CHARGING STATION IN A LOW VOLTAGE NETWORK</b> .....   | 1643 |
| <i>S. Cassano ; F. Silvestro ; E. De Jaeger ; C. Leroi</i>  |      |

|   |      |
|---|------|
| <b>THEORETICAL POTENTIAL OF DYNAMIC LINE RATINGS FOR CONGESTION MANAGEMENT IN LARGE-SCALE POWER SYSTEMS</b> .....   | 1649 |
| <i>Maximilian Schneider ; André Hoffrichter ; Ralf Puffer</i>   |      |
| <b>ENERGY FLEXIBILITY ANALYSIS USING FMUWORLD</b> .....   | 1655 |
| <i>Digvijay Gusain ; Miloš Cvetkovic ; Peter Palensky</i>   |      |
| <b>ELECTRICITY CONSUMPTION FORECASTING IN OFFICE BUILDINGS: AN ARTIFICIAL INTELLIGENCE APPROACH</b> .....   | 1661 |
| <i>Aria Jozi ; Tiago Pinto ; Goreti Marreiros ; Zita Vale</i>   |      |
| <b>AN ADMM APPROACH FOR DAY-AHEAD SCHEDULING OF A LOCAL ENERGY COMMUNITY</b> .....  | 1667 |
| <i>C. Orozco ; S. Lilla ; A. Borghetti ; F. Napolitano ; F. Tossani</i>   |      |
| <b>A MODELLING FRAMEWORK FOR A VIRTUAL POWER PLANT WITH MULTIPLE ENERGY VECTORS PROVIDING MULTIPLE SERVICES</b> .....   | 1673 |
| <i>James Naughton ; Michael Cantoni ; Pierluigi Mancarella</i>  |      |
| <b>PRIMARY FREQUENCY SUPPORT FROM OFFSHORE WIND POWER PLANTS CONNECTED TO HVDC GRIDS</b> .....  | 1679 |
| <i>Ali Bidadfar ; Oscar Saborío-Romano ; Jayachandra N. Sakamuri ; Miifit Altin ; Nicolaos A. Cutululis ; Poul E. Sørensen</i>  |      |
| <b>A POWER-TO-GAS INTEGRATED MICROGRID OPTIMAL OPERATION STRATEGY BASED ON ROLLING HORIZON</b> .....  | 1685 |
| <i>Tongming Liu ; Wang Zhang ; Ke Meng ; Zhao Yang Dong</i>   |      |
| <b>COORDINATED POWER SMOOTHING METHOD OF WIND TURBINE CONSIDERING ESS DEGRADATION COST</b> .....  | 1691 |
| <i>Chunghun Kim ; Hongjoon Kim ; Se-Hee Lee ; Sekyung Han</i>   |      |
| <b>OPEN PHASE CONDITION SCENARIOS FOR NUCLEAR POWER PLANT ELECTRICAL NETWORK STUDIES</b> .....  | 1696 |
| <i>Anna Kulmala ; Antti Alahäivälä</i>  |      |
| <b>REACTIVE POWER RESERVES MANAGEMENT BY DGS FOR VOLTAGE STABILITY ENHANCEMENT: A CASE STUDY</b> .....  | 1702 |
| <i>Abdulaziz Alkuhayli ; Thamer Alquthami ; Iqbal Husain</i>  |      |
| <b>RETROSPECTIVE OPTIMAL POWER FLOW FOR LOW DISCRIMINATING ACTIVE POWER CURTAILMENT</b> .....   | 1708 |
| <i>Friederike Meier ; Christian Töbermann ; Martin Braun</i>  |      |
| <b>VALIDATING COORDINATION SCHEMES BETWEEN TRANSMISSION AND DISTRIBUTION SYSTEM OPERATORS USING A LABORATORY-BASED APPROACH</b> .....   | 1714 |
| <i>Filip Prösl Andrén ; Thomas I. Strasser ; Julien Le Baut ; Marco Rossi ; Giacomo Viganò ; Giacomo Della Croce ; Seppo Horsmanheimo ; Armin Ghasem Azar ; Adrian Ibañez</i>                             |      |
| <b>STATE OF HEALTH PREDICTION OF LI-ION BATTERIES USING INCREMENTAL CAPACITY ANALYSIS AND SUPPORT VECTOR REGRESSION</b> .....   | 1720 |
| <i>Mohsen Vatani ; Mariusz Szepko ; J. S. Preben Vie</i>  |      |
| <b>REACTIVE POWER DISPATCHING AMONG GENERATING UNITS CONNECTED TO POINT OF COMMON COUPLING</b> .....  | 1726 |
| <i>Jasna Dragosavac ; Žarko Janda ; Jelena Pavlović ; Zoran Cirić</i>   |      |
| <b>ANNUAL ELECTRICITY COST MINIMIZATION FOR SOUTH AUSTRALIAN DWELLINGS THROUGH OPTIMAL BATTERY SIZING</b> .....   | 1732 |
| <i>Vanika Sharma ; Mohammed H. Haque ; Syed Mahfuzul Aziz</i>   |      |
| <b>INTEGRATED ENERGY-WATER MODEL FOR INTERDEPENDENT STORAGE, RUN-OF-RIVER AND PUMP HYDROPOWER</b> .....   | 1738 |
| <i>E. A. Martínez Ceseña ; M. Panteli ; J. Mutale ; P. Mancarella ; J. Tomlinson ; J. J. Harou</i>  |      |
| <b>LOCATION OF HIGH IMPEDANCE FAULTS USING SMART METERS IN DISTRIBUTION SYSTEMS WITH DGS, POWER ELECTRONIC LOADS AND ELECTRIC ARC FURNACES</b> .....  | 1744 |
| <i>Asha Radhakrishnan ; Sarasij Das</i>   |      |
| <b>A MIXED INTEGER SECOND ORDER CONE PROGRAM FOR TRANSMISSION-DISTRIBUTION SYSTEM CO-OPTIMIZATION</b> .....   | 1750 |
| <i>Ilyès Mezghani ; Anthony Papavasiliou</i>  |      |
| <b>INTERVAL-BASED ADAPTIVE INERTIA AND DAMPING CONTROL OF A VIRTUAL SYNCHRONOUS MACHINE</b> .....   | 1756 |
| <i>Uros Markovic ; Nicolas Früh ; Petros Aristidou ; Gabriela Hug</i>   |      |
| <b>REAL-TIME MONITORING AND CONTROL SYSTEM FOR TRIESTE UNIVERSITY CAMPUS ELECTRICAL DISTRIBUTION GRID</b> .....   | 1762 |
| <i>Massimiliano Chiandone ; Marco Dalle Feste ; Daniele Bosich ; Giorgio Sulligoi</i>   |      |
| <b>ANALYSIS OF STATE UNCERTAINTY FOR DISTRIBUTION SYSTEM STATE ESTIMATION</b> .....   | 1767 |
| <i>Annika Brüggemann ; Christian Rehtanz ; Theresa Noll</i>   |      |
| <b>IMPROVEMENT OF THE CONSIDERATION OF SHORT-CIRCUIT CURRENT CONTRIBUTIONS FROM DOUBLY-FED INDUCTION GENERATOR BASED WIND TURBINES FOR SHORT-CIRCUIT CURRENT CALCULATION ACCORDING TO IEC 60909</b> ..... | 1773 |
| <i>Thomas Lager ; Lutz Hofmann</i>  |      |
| <b>A LITERATURE REVIEW OF INTRADAY ELECTRICITY MARKETS AND PRICES</b> .....   | 1779 |
| <i>Priyanka Shinde ; Mikael Amelin</i>  |      |
| <b>ZONAL DC DISTRIBUTION SYSTEM BASED ON MULTIPORT CONVERTERS: FAULT ANALYSIS AND PROTECTION DESIGN</b> .....   | 1785 |
| <i>Simone Negri ; Enrico Tironi ; Giovanni Ubezio</i>   |      |

|  |      |
|--|------|
| <b>SMART TRANSFORMER REQUIREMENTS FOR INTEGRATION IN DISTRIBUTION GRIDS AND POWER QUALITY IMPROVEMENT</b> .....  | 1791 |
| <i>Giovanni De Carne ; Xiang Gao ; Zhixiang Zou ; Marco Liserre ; Ali Kazerooni ; Michael Eves</i>   |      |
| <b>STUDYING THE IMPACT OF STORAGE SYSTEMS ON THE PLANNING STUDIES OF LOW VOLTAGE DISTRIBUTION GRIDS</b> .....  | 1797 |
| <i>Ahmed Hadjsaid ; Vincent Debusschere ; Marie-Cecile Alvarez-Herault ; Raphaël Caire</i>   |      |
| <b>TRANSMISSION LINE EXCLUSION ALGORITHM TO SOLVE THE EXPANSION PLANNING PROBLEM</b> .....   | 1803 |
| <i>Paula Vasconcelos Pengo ; Gustavo Rebello ; Edimar Jose De Oliveira ; Ivo Chaves Da Silva Junior</i>  |      |
| <b>CONSIDERING LOCAL PHOTOVOLTAIC PRODUCTION IN PLANNING STUDIES FOR LOW VOLTAGE DISTRIBUTION GRIDS</b> .....  | 1809 |
| <i>Ahmed Hadjsaid ; Vincent Debusschere ; Marie-Cecile Alvarez-Herault ; Raphaël Caire</i>   |      |
| <b>ASSESSING THE NORMALIZED RESIDUALS TECHNIQUE WITH AMB-SE FOR NON-TECHNICAL LOSS DETECTION</b> .....   | 1814 |
| <i>Rodrigo F. G. Sau ; Luis F. Ugarte ; David A. Sarmiento ; Madson C. De Almeida</i>  |      |
| <b>DETECTION AND MONITORING OF SUPRAHARMONIC ANOMALIES OF AN ELECTRIC VEHICLE CHARGING STATION</b> .....   | 1820 |
| <i>Tim Streubel ; Christoph Kattmann ; Adrian Eisenmann ; Krzysztof Rudion</i>   |      |
| <b>EFFECTS OF WIND POWER TECHNOLOGY DEVELOPMENT ON LARGE-SCALE VRE GENERATION VARIABILITY</b> .....  | 1825 |
| <i>Matti Koivisto ; Petr Maule ; Nicolaos Cutululis ; Poul Sørensen</i>  |      |
| <b>MEDIUM-AND LOW-VOLTAGE PLANNING OF ELECTRIC POWER DISTRIBUTION SYSTEMS WITH DISTRIBUTED GENERATION, ENERGY STORAGE SOURCES, AND ELECTRIC VEHICLES</b> ..... | 1831 |
| <i>Diogo Rupolo ; José Roberto Sanches Mantovani ; Benvindo Rodrigues Pereira Junior</i>   |      |
| <b>COORDINATION OF POWER AND NATURAL GAS SYSTEMS: CONVEXIFICATION APPROACHES FOR LINEPACK MODELING</b> .....   | 1836 |
| <i>Anna Schuele ; Christos Ordoudis ; Jalal Kazempour ; Pierre Pinson</i>  |      |
| <b>ESTIMATION OF EXPECTED COST CURVE ON OPERATION PARAMETER SPACE FOR PLANNING RESIDENTIAL PEFC-CGS</b> .....  | 1842 |
| <i>Yuta Tsuchiya ; Yasuhiro Hayashi ; Yu Fujimoto ; Akira Yoshida ; Yoshiharu Amano</i>  |      |
| <b>ITERATIVE ALGORITHM FOR LOCAL ELECTRICITY TRADING</b> .....   | 1847 |
| <i>Amin Shokri Gazafroudi ; Juan Manuel Corchado ; Miadrezha Shafie-Khah ; Mohamed Lofii ; P. S. João Catalão</i>  |      |
| <b>EVALUATION OF CUSTOMER-ORIENTED POWER SUPPLY RISK WITH DISTRIBUTED PV-STORAGE ENERGY SYSTEMS</b> .....  | 1853 |
| <i>Mike Brian Ndawula ; Antonio De Paola ; Ignacio Hernando-Gil</i>  |      |
| <b>IMPACT OF ROCOF-BASED ISLANDING DETECTION ON THE STAND-ALONE OPERATION OF A DISTRIBUTED SYNCHRONOUS GENERATOR</b> .....                                     | 1859 |
| <i>Artur B. Piardi ; Rodrigo B. Otto ; Liciane Otremba ; Daniel Motter ; Ahda P. G. Pavani ; Rodrigo A. Ramos</i>  |      |
| <b>ISLANDED MICROGRID VOLTAGE CONTROL STRUCTURE SMALL-SIGNAL STABILITY ANALYSIS</b> .....  | 1865 |
| <i>Guy Wanlongo Ndiwulu ; Emmanuel De Jaeger ; Angelo Kuti Lusala</i>  |      |
| <b>FREQUENCY SUPPORT PROVISION BY PARALLEL, HYBRID HVDC-HVAC SYSTEM WITH VOLTAGE-BASED LOAD CONTROL</b> .....  | 1871 |
| <i>Marius Langwasser ; Matthias Biskoping ; Giovanni De Carne ; Marco Liserre</i>  |      |
| <b>THE IMPACT OF VOLTAGE DIPS TO LOW-VOLTAGE-RIDE-THROUGH CAPACITY OF DOUBLY FED INDUCTION GENERATOR BASED WIND TURBINE</b> .....                              | 1877 |
| <i>Cheng Chen ; Azam Bagheri ; Math H. J. Bollen ; Massimo Bongiorno</i>   |      |
| <b>MODELLING OF INTEGRATED TRANSMISSION AND DISTRIBUTION GRIDS BASED ON SYNTHETIC DISTRIBUTION GRID MODELS</b> .....   | 1883 |
| <i>Marcel Sarstedt ; Steffen Garske ; Christoph Blaufuß ; Lutz Hofmann</i>   |      |
| <b>A QUASI-DYNAMIC TOOL FOR VALIDATION OF POWER SYSTEM RESTORATION STRATEGIES AT DISTRIBUTION LEVEL</b> .....  | 1889 |
| <i>Davood Raoofsheibani ; Philipp Hinkel ; Wolfram H. Wellssow</i>   |      |
| <b>SYSTEM OF THE TRAVELING-WAVE FAULT LOCATION IN 6(10) KV TREELIKE DISTRIBUTION ELECTRIC GRIDS</b> .....  | 1895 |
| <i>R. G. Khuzyashev ; I. L. Kuzmin ; V. D. Vasilyev ; S. M. Tukaev</i>   |      |
| <b>IMPROVING ELECTRICITY AND NATURAL GAS SYSTEMS COORDINATION USING SWING OPTION CONTRACTS</b> .....   | 1899 |
| <i>Conor O'Malley ; Stefanos Delikaraoglou ; Gabriela Hug</i>  |      |
| <b>TECHNO-ECONOMIC ASSESSMENT OF RESERVE SERVICE PROVISION FROM MICROGRIDS FOR RESILIENCE ENHANCEMENT</b> .....  | 1905 |
| <i>Asimina Frosinou ; Yutian Zhou ; Mathaios Panteli</i>   |      |
| <b>OPTIMAL DER REGULATION AND STORAGE ALLOCATION IN DISTRIBUTION NETWORKS: VOLT/VAR OPTIMIZATION AND CONGESTION RELIEF</b> .....                               | 1911 |
| <i>F. D'Agostino ; S. Massucco ; P. Pongiglione ; M. Saviozzi ; F. Silvestro</i>   |      |
| <b>OPTIMAL TUNING AND PLACEMENT OF POD FOR SSCI MITIGATION IN DFIG-BASED POWER SYSTEM</b> .....  | 1917 |
| <i>Muhammad Taha Ali ; Mehrdad Ghandhari ; Lennart Hatnefors</i>   |      |
| <b>INFRASTRUCTURING OF CANADIAN TRANSPORT USING HYDROGEN FROM RES: COMPARISON BETWEEN BEV AND FCV</b> .....  | 1923 |
| <i>M. Brenna ; F. Foidelli ; M. Longo ; W. Yaïci</i>   |      |

|  |      |
|--|------|
| <b>A QUADRATIC CONVEX APPROXIMATION FOR THE SHORT-TERM HYDRO-THERMAL DISPATCH</b> .....  | 1928 |
| <i>Juan-Camilo Castaño ; Alejandro Garcés ; Olav B. Fosso</i>  |      |
| <b>EVALUATION OF IMPACT OF REGULATION SIGNAL ON ENERGY STORAGE OPERATION IN PJM REGULATION MARKET</b> .....  | 1934 |
| <i>Yanzhu Ye ; Bo Yang ; Panitarn Chongfuangprinya ; Sumito Tobe ; Yasushi Tomita</i>  |      |
| <b>PHASE BALANCING IN POWER DISTRIBUTION SYSTEMS: A HEURISTIC APPROACH BASED ON GROUP-THEORY</b> .....   | 1940 |
| <i>Miguel Angel Rios ; Juan Camilo Castaño ; Alejandro Garcés ; Alexander Molina-Cabrera</i>   |      |
| <b>ENERGY MANAGEMENT OF BUILDINGS WITH PHASE CHANGE MATERIALS BASED ON DYNAMIC PROGRAMMING</b> .....   | 1946 |
| <i>Zahra Rahimpour ; Gregor Verbic ; Archie C. Chapman</i>   |      |
| <b>PLANNING MODEL OF MICROGRIDS FOR THE SUPPLY OF ANCILLARY SERVICES TO THE UTILITY GRID</b> .....   | 1952 |
| <i>Andrés F. Peñaranda ; Pablo E. Mosquera ; Camilo A. Cortés ; Sergio F. Contreras ; Johanna M. A. Myrzik</i>                                       |      |
| <b>A MIXED-INTEGGER DISTRIBUTIONALLY ROBUST CHANCE-CONSTRAINED MODEL FOR OPTIMAL TOPOLOGY CONTROL IN POWER GRIDS WITH UNCERTAIN RENEWABLES</b> ..... | 1958 |
| <i>Mostafa Nazemi ; Payman Dehghanian ; Miguel Lejeune</i>   |      |
| <b>A STUDY OF RISK REDUCTION FOR DAILY PEAK LOAD DEMAND FORECASTING</b> .....  | 1964 |
| <i>Kodai Ogihara ; Shoichi Urano</i>   |      |
| <b>REVIEW OF ASYNCHRONOUS INTERCONNECTION TECHNOLOGY IN CHINA SOUTHERN POWER GRID</b> .....  | 1970 |
| <i>Bo Li ; Zuo Wang ; Jianing Liu ; Zhu Chao ; Dongrui Zhang ; Qi Wang ; Jin Zhong ; Yufeng Guo</i>  |      |
| <b>INTENTIONAL CONTROLLED ISLANDING OF POWER SYSTEMS EQUIPPED WITH BATTERY ENERGY STORAGE SYSTEMS</b> .....  | 1975 |
| <i>Panayiotis Demetriou ; Alexis Kyriacou ; Elias Kyriakides ; Christos Panayiotou</i>   |      |
| <b>SIZING STORAGE FOR RELIABLE RENEWABLE INTEGRATION</b> .....   | 1981 |
| <i>Vivek Deulkar ; Jayakrishnan Nair ; Ankur A. Kulkarni</i>   |      |
| <b>INCREMENTAL DEEP-LEARNING FOR CONTINUOUS LOAD PREDICTION IN ENERGY MANAGEMENT SYSTEMS</b> .....   | 1987 |
| <i>Gustavo Aragón ; Harsh Puri ; Alexander Grass ; Sisay Chala ; Christian Beecks</i>  |      |
| <b>DISTRIBUTED CONSENSUS CONTROL WITH EVENT-TRIGGERED COMMUNICATION FOR MULTI-MICROGRID CLUSTER</b> .....  | 1993 |
| <i>Yaran Li ; Ke Meng ; Zhao Yang Dong</i>   |      |
| <b>SHORT-TERM PROBABILISTIC LOAD FORECASTING AT LOW AGGREGATION LEVELS USING CONVOLUTIONAL NEURAL NETWORKS</b> .....                                 | 1999 |
| <i>Alexander Elvers ; Marcus Voß ; Sahin Albayrak</i>  |      |
| <b>MODULAR WHITE-BOX MODEL OF SINGLE-PHASE PHOTOVOLTAIC SYSTEMS FOR HARMONIC STUDIES</b> .....   | 2005 |
| <i>Elias Kaufhold ; Jan Meyer ; Peter Schegner</i>   |      |
| <b>CHALLENGES AND PITFALLS OF IMPLEMENTING REALISTIC SIMULATIONS TO STUDY HARMONIC LEVELS IN PUBLIC LOW VOLTAGE NETWORKS</b> .....                   | 2011 |
| <i>Sascha Müller ; Jan Meyer</i>   |      |
| <b>IDENTIFICATION AND DIAGNOSIS OF A PHOTOVOLTAIC MODULE BASED ON OUTDOOR MEASUREMENTS</b> .....   | 2017 |
| <i>G. Spagnuolo ; K. Lappalainen ; S. Valkealahti ; P. Manganiello</i>   |      |
| <b>VOLTAGE UNBALANCE QUANTIFICATION AND MITIGATION USING A PMU-BASED COMBINED TRANSMISSION AND DISTRIBUTION SYSTEM LINEAR STATE ESTIMATOR</b> .....  | 2023 |
| <i>Papiya Dutta ; Aditya Nadkatni ; Gopal Gajjar ; S. A. Soman</i>   |      |
| <b>ECONOMICS OF VEHICLE-TO-GRID APPLICATION FOR PROVIDING ANCILLARY SERVICES IN ITALY</b> .....  | 2029 |
| <i>Luca Latini ; Fabrizio Bruno Armani ; Sonia Leva ; Fabio Di Ninno ; Giovanni Ravina</i>   |      |
| <b>USING ELECTRIC VEHICLES AND DEMAND SIDE RESPONSE TO UNLOCK DISTRIBUTION NETWORK FLEXIBILITY</b> .....   | 2035 |
| <i>Hasan Berkem Sonder ; Liana Cipcigan ; Carlos Ugalde Loo</i>  |      |
| <b>ONLINE DEMAND RESPONSE FOR END-USER LOADS</b> .....   | 2041 |
| <i>Arman Alahyari ; David Pozo</i>   |      |
| <b>INERTIAL RESPONSE OF ISOLATED POWER NETWORKS WITH WIND POWER PLANTS</b> .....   | 2047 |
| <i>M. Bongiorno ; S. Favuzza ; M. G. Ippolito ; R. Musca ; G. Zizzo</i>  |      |
| <b>INFLUENCE OF FLEXIBILITY MODELING PARAMETERS ON RESIDENTIAL-SCALE DEMAND RESPONSE ASSESSMENT</b> .....  | 2053 |
| <i>Karlis Baltputnis ; Zane Broka ; Antans Sauhats</i>   |      |
| <b>FREQUENCY REGULATION SERVICES BY A BESS-GENERATOR SYSTEM USING PREDICTIVE CONTROL</b> .....   | 2059 |
| <i>F. Conte ; S. Massucco ; G.-P. Schiapparelli ; F. Silvestro</i>   |      |
| <b>DESIGN OF POWER SYSTEM STABILIZERS TO DAMP LOW FREQUENCY INTER-AREA OSCILLATIONS WITH LIMITED INFORMATION</b> .....                               | 2065 |
| <i>J. Renedo ; L. Sigríst ; L. Rouco</i>   |      |
| <b>CAPACITY VALUE OF VARIABLE-SPEED WIND TURBINES</b> .....  | 2071 |
| <i>Hamed Farhadi Gharibeh ; Leyla Mokhtari Khiavi ; Meisam Farrokhifar ; Arman Alahyari ; David Pozo</i>   |      |



|   |      |
|---|------|
| <b>A RISK-BASED RESILIENCE ASSESSMENT TOOL TO ANTICIPATE CRITICAL SYSTEM CONDITIONS IN CASE OF NATURAL THREATS</b> .....  | 2076 |
| <i>E. Ciapessoni ; D. Cirio ; A. Pitto ; M. Sforna</i>  |      |
| <b>FAULT CURRENT LIMITING INVESTIGATION FOR A SINGLE-PHASE DYNAMIC VOLTAGE CONDITIONER</b> .....  | 2082 |
| <i>Roberto Faranda ; Ali Bahrami ; Hossein Hafezi</i>   |      |
| <b>MEASUREMENT BASED IDENTIFICATION OF EQUIVALENT CIRCUIT MODELS FOR AGGREGATED HARMONIC IMPEDANCES OF PUBLIC LOW VOLTAGE GRIDS</b> .....                           | 2088 |
| <i>Max Domagk ; Robert Stiegler ; Jan Meyer</i>   |      |
| <b>GRID-FORMING INVERTERS REPLACING DIESEL GENERATORS IN SMALL-SCALE ISLANDED POWER SYSTEMS</b> .....   | 2094 |
| <i>Pedro P. Beires ; Carlos L. Moreira ; João Peças Lopes</i>   |      |
| <b>FLEXIBLE AND RECONFIGURABLE AUTOMATION ARCHITECTURE FOR ELECTRICAL POWER SYSTEMS</b> .....   | 2100 |
| <i>Jorge Velasquez ; Carsten Krüger ; Davood Babazadeh ; Sebastian Lehnhoff ; Rajkumar Palaniappan ; Björn Bauernschmitt ; Dominik Hilbrich ; Christian Rehtanz</i> |      |
| <b>UPRATING STUDIES FOR A 230 KV-50 HZ OVERHEAD LINE</b> .....  | 2106 |
| <i>Luigi Michi ; Enrico Maria Carlini ; Michela Migliori ; Francesco Palone ; Stefano Lauria</i>  |      |
| <b>USING CAUSAL INFERENCE TO MEASURE RESIDENTIAL CONSUMERS DEMAND RESPONSE ELASTICITY</b> .....   | 2112 |
| <i>Kamalanathan Ganesan ; João Tomé Saraiva ; Ricardo J. Bessa</i>  |      |
| <b>HOLISTIC TIME-VARYING SMALL SIGNAL STABILITY ASSESSMENT IN PV-RICH POWER SYSTEMS</b> .....   | 2118 |
| <i>William J. Nacmanson ; Dillon Jaglal ; Luis F. Ochoa</i>   |      |
| <b>CHARACTERIZATION OF THE GRID-FORMING FUNCTION OF A POWER SOURCE BASED ON ITS EXTERNAL FREQUENCY SMOOTHING CAPABILITY</b> .....                                   | 2124 |
| <i>Mane-Sophie Debry ; Guillaume Denis ; Thibault Prevost</i>   |      |
| <b>IMPACT ON RELIABILITY OF TRANSFORMERS ON ACCOUNT OF PHASE UNBALANCES IN EHV NETWORK</b> .....  | 2130 |
| <i>Aman Gautam ; Abhishek Gautam ; Rahul Shukla ; Ashok Kumar ; N. Nallarasan ; S. R. Narasimhan</i>  |      |
| <b>SPECTRAL PROPERTIES OF DYNAMICAL POWER SYSTEMS</b> .....   | 2136 |
| <i>Felix Koeth ; Nicolas Retiere</i>  |      |
| <b>DATA-DRIVEN CONTROL DESIGN SCHEMES IN ACTIVE DISTRIBUTION GRIDS: CAPABILITIES AND CHALLENGES</b> .....   | 2142 |
| <i>Stavros Karagiannopoulos ; Roel Dobbe ; Petros Aristidou ; Duncan Callaway ; Gabriela Hug</i>  |      |
| <b>IMPACT OF GRID TARIFFS DESIGN ON THE ZERO EMISSION NEIGHBORHOODS ENERGY SYSTEM INVESTMENTS</b> .....   | 2148 |
| <i>Dimitri Pinel ; Sigurd Bjarghov ; Magnus Korpås</i>  |      |
| <b>INADEQUACY OF STANDARD ALGORITHMS AND METRICS FOR SHORT-TERM LOAD FORECASTS IN LOW-VOLTAGE GRIDS</b> .....   | 2154 |
| <i>Thierry Zufferey ; Alice Lepouze ; Gabriela Hug</i>  |      |
| <b>USING THE ECOVAT SYSTEM TO SUPPLY THE HEAT DEMAND OF A NEIGHBOURHOOD</b> .....   | 2160 |
| <i>Gijs J. H. De Goeijen ; Gerwin Hoogsteen ; Johann L. Hurink ; Gerard J. M. Smit</i>  |      |
| <b>DAY-AHEAD ELECTRICITY MARKET PRICE FORECASTING USING ARTIFICIAL NEURAL NETWORK WITH SPEARMAN DATA CORRELATION</b> .....  | 2166 |
| <i>João Nascimento ; Tiago Pinto ; Zita Vale</i>  |      |
| <b>PSS MODIFICATION TO STABILIZE SYNCHRONOUS MACHINES DURING EVENTS WITH HIGH RATE OF CHANGE OF FREQUENCY</b> .....   | 2172 |
| <i>Armin Kerperin ; Alf Assenkamp ; Christian Kreischer</i>   |      |
| <b>INFLUENCE OF COMBINING REAL-TIME AND FIXED TARIFFS IN THE DEMAND RESPONSE AGGREGATION AND REMUNERATION SCHEEMS DEFINITION</b> .....                              | 2178 |
| <i>Cátia Silva ; Pedro Faria ; Zita Vale</i>  |      |
| <b>MODELING OF CONSUMER PREFERENCES AND CONSTRAINTS FOR THE OPTIMAL SCHEDULE OF CONSUMPTION SHIFTING</b> .....  | 2184 |
| <i>Pedro Faria ; João Spínola ; Zita Vale</i>   |      |
| <b>CONGESTION MANAGEMENT IN DISTRIBUTION GRID NETWORKS THROUGH ACTIVE POWER CONTROL OF FLEXIBLE DISTRIBUTED ENERGY RESOURCES</b> .....                              | 2190 |
| <i>R. Ciavarella ; M. Di Somma ; G. Graditi ; M. Valenti</i>  |      |
| <b>COST-RELIABILITY OPTIMIZATION OF AUTOMATION AND PROTECTION CONFIGURATIONS IN ACTIVE DISTRIBUTION GRIDS</b> .....   | 2196 |
| <i>Michiel Tavernier ; Stavros Karagiannopoulos ; Philipp Fortenbacher ; Evdokia Kaffe ; Gabriela Hug</i>   |      |
| <b>IMPACT OF HARMONIC POLLUTION IN JUNCTIONS BETWEEN DC CABLES WITH DIFFERENT INSULATING TECHNOLOGIES: ELECTRICAL AND THERMAL ANALYSES</b> .....                    | 2202 |
| <i>A. Colavitto ; A. Contin ; A. Vicenzutti ; G. Sulligoi ; M. McCandless</i>   |      |
| <b>IMPACT INDEX FOR ALLOCATING TRANSPORTABLE ENERGY STORAGE SYSTEMS IN POWER DISTRIBUTION NETWORKS</b> .....  | 2208 |
| <i>Sérgio A. De Moraes Filho ; Felipe M. Dos S. Monteiro ; José Carlos M. Vieira ; Eduardo N. Asada ; Mauricio Biczkowski</i>                                       |      |
| <b>DYNAMIC SIMULATION OF SIMULTANEOUS HVDC CONTINGENCIES RELEVANT FOR VULNERABILITY ASSESSMENT OF THE NORDIC POWER SYSTEM</b> .....                                 | 2214 |
| <i>Espen Hafstad Solvang ; Iver Bakken Sperstad ; Sigurd Hofsmo Jakobsen ; Kjetil Uhlen</i>   |      |

|  |             |
|--|-------------|
| <b>PROVISION OF ANCILLARY SERVICES BY DIFFERENT DECENTRALIZED ENERGY RESOURCES .....</b>   | <b>2220</b> |
| <i>Christoph Strunck ; Marvin Albrecht ; Christian Rehtanz</i>   |             |
| <b>TAYLOR-FOURIER PMU ON A REAL-TIME SIMULATOR: DESIGN, IMPLEMENTATION AND CHARACTERIZATION .....</b>  | <b>2226</b> |
| <i>G. Frigo ; A. Derviškić ; Y. Zuo ; A. Bach ; M. Paolone</i>   |             |
| <b>NEW CONTROL APPROACH FOR BLACKSTART CAPABILITY OF FULL CONVERTER WIND TURBINES WITH DIRECT VOLTAGE CONTROL .....</b>  | <b>2232</b> |
| <i>A. Korai ; J. Denecke ; J. L. Rueda Torres ; E. Rakshani</i>  |             |
| <b>CORONA INCEPTION AND BREAKDOWN VOLTAGES OF ROD-PLANE ELECTRODE FOR SEVERE AMBIENT CONDITIONS .....</b>  | <b>2238</b> |
| <i>Shayan Shahi Gharaaghaji ; Hamza Fadil ; Suat Ilhan ; Aydogan Ozdemir ; Hasbi Ismailoglu ; Fermin Espino Cortes</i>   |             |
| <b>SUBOPTIMALITY OF DECENTRALIZED METHODS FOR OPF .....</b>  | <b>2243</b> |
| <i>Ilgiz Murzakhanov ; Alexander Malakhov ; Elena Gryazina</i>   |             |
| <b>IMPACT OF A MINIMUM REMAINING AVAILABLE MARGIN ADJUSTMENT IN FLOW-BASED MARKET COUPLING .....</b>   | <b>2249</b> |
| <i>Björn Matthes ; Christopher Spieker ; Dennis Klein ; Christian Rehtanz</i>  |             |
| <b>PRICING MECHANISM BASED ON LOSSES USING GRID TOPOLOGY .....</b>   | <b>2255</b> |
| <i>Victor M. J. J. Reijnders ; Marco E. T. Gerards ; Johann L. Hurink</i>  |             |
| <b>DEVELOPMENT OF A FORECAST MODEL FOR THE PREDICTION OF PHOTOVOLTAIC POWER USING NEURAL NETWORKS AND VALIDATING THE MODEL BASED ON REAL MEASUREMENT DATA OF A LOCAL PHOTOVOLTAIC SYSTEM .....</b> | <b>2261</b> |
| <i>Michael Kelker ; Katrin Schulte ; Dirk Hansmeier ; Felix Annen ; Kersten Kröger ; Paul Lohmann ; Jens Haubrock</i>  |             |
| <b>UNLOCKING THE FLEXIBILITY OF CHP IN DISTRICT HEATING SYSTEMS TO PROVIDE FREQUENCY RESPONSE .....</b>  | <b>2267</b> |
| <i>Xiandong Xu ; Yue Zhou ; Meysam Qadrdan ; Jianzhong Wu</i>  |             |
| <b>INCLUSION OF CONVERTER CONTROLLER MEASUREMENTS INTO STATE ESTIMATION ALGORITHM FOR HYBRID AC-DC GRID .....</b>  | <b>2273</b> |
| <i>Gaurav Kumar Roy ; Marco Pau ; Abhinav Sadu ; Ferdinanda Ponci ; Antonello Monti</i>  |             |
| <b>ONLINE LOAD CONTROL IN MEDIUM VOLTAGE GRID BY MEANS OF REACTIVE POWER MODIFICATION OF FAST CHARGING STATION .....</b>   | <b>2279</b> |
| <i>Xiang Gao ; Giovanni De Carne ; Marius Langwasser ; Marco Liserre</i>   |             |
| <b>SMART TRANSFORMERS - ENABLING POWER-FREQUENCY REGULATION SERVICES FOR HYBRID AC/DC NETWORKS .....</b>   | <b>2285</b> |
| <i>Justino Rodrigues ; Carlos Moreira ; João Peças Lopes</i>   |             |
| <b>STABILITY OF POWER NETWORKS WITH GRID-FORMING CONVERTERS .....</b>  | <b>2291</b> |
| <i>Jeremy Watson ; Yemi Ojo ; Ioannis Lestas ; Chrysovalantis Spanias</i>  |             |
| <b>MODELLING OF THE DEMAND CURVE OF THE ITALIAN CAPACITY MARKET .....</b>  | <b>2297</b> |
| <i>Ahmed Hussein Othman Fouad ; Cristian Bovo</i>  |             |
| <b>POLE-TO-GROUND FAULT PROTECTION STRATEGY FOR HVDC GRIDS UNDER SYMMETRICAL MONOPOLAR CONFIGURATION .....</b>   | <b>2303</b> |
| <i>Alberto Bertinato ; Pascal Torwelle ; Guilherme Dantas De Freitas ; Manuel Colmenero ; Bertrand Raison</i>  |             |
| <b>A CYBER-PHYSICAL PLATFORM FOR SIMULATING ENERGY TRANSACTIONS IN LOCAL ENERGY MARKETS .....</b>  | <b>2309</b> |
| <i>Marco Galici ; Emilio Ghiani ; Matteo Troncia ; Giuditta Pisano ; Fabrizio Pilo</i>   |             |
| <b>PROSUMER MARKETS: A UNIFIED FORMULATION .....</b>   | <b>2315</b> |
| <i>T. Baroche ; F. Moret ; P. Pinson</i>   |             |
| <b>RENEWABLE ENERGY INTEGRATION IN INDIA: PRESENT STATE AND LONG-TERM PERSPECTIVE .....</b>  | <b>2321</b> |
| <i>Sushil K. Soonee ; Samir C. Saxena ; K. V. S. Baba ; S. R. Narasimhan ; K. V. N. Pawan Kumar ; Praveen K. Agarwal ; Pankaj Batra ; Subrata Mukhopadhyay</i>                                     |             |
| <b>RAPID EVALUATION OF BATTERY SYSTEM RATING FOR FREQUENCY RESPONSE OPERATION .....</b>  | <b>2327</b> |
| <i>Vasileios Tsormpatzoudis ; Andrew J. Forsyth ; Rebecca Todd</i>   |             |
| <b>XSG-BASED CONTROL SCHEME FOR A GRID-CONNECTED HYBRID GENERATION SYSTEM .....</b>  | <b>2333</b> |
| <i>N. Chettibi ; A. Mellit ; A. Massi Pavan ; V. Lughì ; S. Leva</i>   |             |
| <b>NUMERICAL AND EXPERIMENTAL TESTING OF PREDICTIVE EMS ALGORITHMS FOR PV-BESS RESIDENTIAL MICROGRID .....</b>   | <b>2339</b> |
| <i>S. Polimeni ; L. Moretti ; G. Manzolini ; S. Leva ; L. Meraldi ; P. Raboni</i>  |             |
| <b>A METHOD FOR SIZING CENTRALISED ENERGY STORAGE SYSTEMS USING STANDARD PATTERNS .....</b>  | <b>2345</b> |
| <i>Shahab Karrari ; Nicole Ludwig ; Veit Hagenmeyer ; Mathias Noe</i>  |             |
| <b>COORDINATED DISPATCH PERFORMANCE OF AC GRID-CONNECTED ENERGY STORAGE SYSTEMS .....</b>  | <b>2351</b> |
| <i>Rebecca Todd ; Alessandro Massi Pavan ; Tom Feehally ; Andrew Forsyth ; Shahab Nejad ; Daniel Gladwin ; David Stone ; Martin Foster</i>   |             |
| <b>MITIGATION OF COMMUNICATION COSTS IN PEER-TO-PEER ELECTRICITY MARKETS .....</b>   | <b>2357</b> |
| <i>R. Le Goff Latimier ; T. Baroche ; H. Ben Ahmed</i>   |             |
| <b>PERFORMANCE ASSESSMENT OF KRON REDUCTION IN THE NUMERICAL ANALYSIS OF POLYPHASE POWER SYSTEMS .....</b>   | <b>2363</b> |
| <i>Andreas Martin Kettner ; Mario Paolone</i>  |             |
| <b>LIGHTNING-ORIGINATED OVERVOLTAGES IN A MULTI-CIRCUIT HV-MV LINE .....</b>   | <b>2369</b> |
| <i>A. Borghetti ; F. Napolitano ; C. A. Nucci ; J. D. Rios Penalzoza ; F. Tossani ; G. M. Ferraz ; A. Piantini</i>   |             |
| <b>IMPLEMENTATION OF SCADA SYSTEMS FOR A REAL MICROGRID LAB TESTBED .....</b>  | <b>2375</b> |
| <i>Luigi Martirano ; Mostafa Kermani ; Francesco Manzo ; Arsalan Bayatmakoo ; Umberto Graselli</i>   |             |

|  |      |
|--|------|
| <b>AN IMPROVED UFLS SCHEME BASED ON ESTIMATED MINIMUM FREQUENCY AND POWER DEFICIT</b> .....  | 2381 |
| <i>Hassan Haes Alhelou ; M. E. H. Golshan ; R. Zamani ; M. P. Moghaddam ; Takawira C. Njenda ; Pierluigi Siano ; Mousa Marzband</i>      |      |
| <b>IMPACT OF GAS THIRD PARTY ACCESS IN THE UNIT COMMITMENT OPTIMAL SOLUTION</b> .....  | 2387 |
| <i>Pedro Otaola-Arca ; Javier García-González ; Fernando Mariño ; Ignacio Rivera</i>   |      |
| <b>PERFORMANCE INVESTIGATION OF A MONITORING SCHEME FOR LOW VOLTAGE GRIDS WITH A SINGLE GROUNDED NEUTRAL</b> .....                       | 2393 |
| <i>Andreas Kotsonias ; Lenos Hadjidemetriou ; Markos Asprou ; Elias Kyriakides</i>   |      |
| <b>CRITICAL BUS VOLTAGE MAPPING USING ANFIS WITH REGARDS TO MAX REACTIVE POWER IN PV BUSES</b> .....                                     | 2399 |
| <i>F. Fachini ; B. I. L. Lopes</i>   |      |
| <b>RELIABILITY EVALUATION OF ICT USED ON DYNAMIC LINE RATING FOR POWER SYSTEM FLEXIBILITY</b> .....                                      | 2405 |
| <i>Carlos Cruzat ; Konstantinos Kopsidas</i>   |      |
| <b>IMPROVING FORECAST ACCURACY USING A SYNTHETIC WEATHER STATION: AN INCREMENTAL APPROACH AND BFCOM2018 LESSONS LEARNED</b> .....        | 2411 |
| <i>Daniel L. Donaldson ; Zafar A. Khan ; Dilan Jayaweera</i>   |      |
| <b>NEW METHOD BASED ON WAVELET TRANSFORM AND ANN FOR MULTITERMINAL HVDC SYSTEM PROTECTION</b> .....                                      | 2417 |
| <i>Julio Octavio Arita Torres ; Ricardo Caneloi Dos Santos</i>   |      |
| <b>SIMPLIFIED VOLTAGE SENSITIVITY BASED CURTAILMENT ARRANGEMENT FOR ACTIVE NETWORK MANAGEMENT</b> .....                                  | 2423 |
| <i>Thiago Mendonca ; Nathaniel Bottrell ; Tim Green</i>  |      |
| <b>IMPACTS OF FEEDER FAILURE STATISTICS ON EV-SUPPORTED DISTRIBUTION SYSTEM RELIABILITY IMPROVEMENT</b> .....                            | 2429 |
| <i>Sitki Guner ; Aydogan Ozdemir</i>   |      |
| <b>HARMONIC RESONANCE ANALYSIS FOR DFIG-BASED OFFSHORE WIND FARM WITH VSC-HVDC CONNECTION</b> .....                                      | 2435 |
| <i>Yonggang Zhang ; Christian Klabunde ; Martin Wolter</i>   |      |
| <b>IMPACT OF DISTRIBUTED PV GENERATION ON RELAY COORDINATION AND POWER QUALITY</b> .....   | 2441 |
| <i>Muhammad Akmal ; Faris Al-Naemi ; Nusrat Iqbal ; Anas Al-Tarabsheh ; Lasantha Meegahapola</i>   |      |
| <b>PERFORMANCE IMPROVEMENT OF RAILWAY POWER CONDITIONER WITH MODEL PREDICTIVE CONTROL APPROACH</b> .....                                 | 2447 |
| <i>Hamed Jafari Kaleybar ; Seyed Saeed Fazel ; Arefeh Rasi Vayghan ; Morris Brenna ; Federica Foidelli</i>                               |      |
| <b>POWER QUALITY INDICATORS IN ELECTRIC RAILWAY SYSTEMS: A COMPREHENSIVE CLASSIFICATION</b> .....  | 2453 |
| <i>Morris Brenna ; Federica Foidelli ; Hamed Jafari Kaleybar ; Seyed Saeed Fazel</i>   |      |
| <b>A NOVEL IMPROVED HILBERT-HUANG TRANSFORM TECHNIQUE FOR IMPLEMENTATION OF POWER SYSTEM LOCAL OSCILLATION MONITORING</b> .....          | 2459 |
| <i>Reza Zamani ; Mohsen Parsa Moghaddam ; Maryam Imani ; Hassan Haes Alhelou ; Mohammad Esmail Hamedani Golshan ; Pierluigi Siano</i>    |      |
| <b>QUALIFYING TRANSMISSION LINE SIGNIFICANCE ON CASCADING FAILURES USING CUT-SETS</b> .....  | 2465 |
| <i>C. Caro-Ruiz ; A. Pavas ; E. Mojica-Nava ; J. Ma ; D. J. Hill</i>   |      |
| <b>LEARNING FROM POWER SYSTEM DATA STREAM</b> .....  | 2471 |
| <i>Mauro Escobar ; Daniel Bienstock ; Michael Cherikov</i>   |      |
| <b>MODELLING AND FORECASTING OF ELECTRICAL CONSUMPTION FOR DEMAND RESPONSE APPLICATIONS</b> .....  | 2477 |
| <i>Iacob Crucianu ; Otilia Bularca ; Ana-Maria Dumitrescu</i>  |      |
| <b>POWER QUALITY PROBLEMS IN HOSPITAL: A CASE STUDY</b> .....  | 2483 |
| <i>A. Prudenzi ; A. Fioravanti ; L. Petriconi ; V. Caracciolo</i>  |      |
| <b>FORECASTING THE ELECTRICITY HOURLY CONSUMPTION OF RESIDENTIAL CONSUMERS WITH SMART METERS USING MACHINE LEARNING ALGORITHMS</b> ..... | 2489 |
| <i>Eduardo Martín Sobrino ; Andrea Veiga Santiago ; Alicia Mateo González</i>  |      |
| <b>PHOTOVOLTAIC POWER PRODUCTION ESTIMATION BASED ON NUMERICAL WEATHER PREDICTIONS</b> .....   | 2495 |
| <i>F. E. Atencio Espejo ; S. Grillo ; L. Luini</i>   |      |
| <b>PROPERTIES OF DIRECT-TIME AND REVERSED-TIME TRANSFER FUNCTIONS TO LOCATE DISTURBANCES ALONG POWER TRANSMISSION LINES</b> .....        | 2501 |
| <i>Zhe Chen ; Zhaoyang Wang ; Mario Paolone ; Farhad Rachidi</i>   |      |
| <b>TOTAL COST OF OWNERSHIP OF ELECTRIC VEHICLES USING ENERGY FROM A RENEWABLE-BASED MICROGRID</b> .....                                  | 2507 |
| <i>Alessandro Massi Pavan ; Vanni Lughi ; Mariangela Scorrano</i>  |      |
| <b>MEASUREMENT AND FEM ANALYSIS OF DC/GIC EFFECTS ON TRANSFORMER MAGNETIZATION PARAMETERS</b> .....                                      | 2513 |
| <i>Hilary K. Chisepo ; C. T. Gaunt ; Leslie D. Borrill</i>   |      |
| <b>DESIGN OF INTEROPERABLE COMMUNICATION ARCHITECTURE FOR TSO-DSO DATA EXCHANGE</b> .....  | 2519 |
| <i>Nermin Suljanovic ; Andrej Souvent ; Gareth Taylor ; Mohammed Radi ; Jérôme Cantenot ; Eric Lambert ; Hugo Morais</i>                 |      |

|   |      |
|---|------|
| <b>THE EFFECT OF INACCURATE LOAD COMPOSITION ON POWER SYSTEM CONTINGENCY ANALYSIS AND PLANNING</b> .....  | 2525 |
| <i>Elena Polykarpou ; Markos Asprou ; Elias Kyriakides</i>  |      |
| <b>BATTERY ENERGY STORAGE SYSTEM AND IMPROVED COMMUNICATION TOPOLOGY FOR ENHANCING POWER QUALITY OF MICROGRID</b> .....   | 2531 |
| <i>Vishal Undre ; Alberto Dolara ; Sonia Leva</i>   |      |
| <b>A LONG-TERM REACTIVE POWER PLANNING FRAMEWORK FOR TRANSMISSION GRIDS WITH HIGH SHARES OF VARIABLE RENEWABLE GENERATION</b> .....                               | 2537 |
| <i>Nikolaos Savvopoulos ; C. Yaman Evrenosoglu ; Adamantios Marinakis ; Alexander Oudalov ; Nikos Hatzigiorgiou</i>   |      |
| <b>RELATION OF WINDING RESISTANCE MEASUREMENT AND DISSOLVED GAS ANALYSIS FOR POWER TRANSFORMERS</b> .....   | 2543 |
| <i>Roya Nikjoo ; Nami Mahmoudi</i>  |      |
| <b>DETECTION AND CHARACTERIZATION OF DOMESTIC HEAT PUMPS</b> .....  | 2549 |
| <i>Guillaume Le Ray ; Morten Herget Christensen ; Pierre Pinson</i>   |      |
| <b>DISTRIBUTION NETWORK PLANNING TOOL FOR RURAL AREAS</b> .....   | 2555 |
| <i>Thai Phuong Do ; Marie-Cecile Alvarez-Herault</i>  |      |
| <b>DATA-DRIVEN LEARNING FROM DYNAMIC PRICING DATA - CLASSIFICATION AND FORECASTING</b> .....  | 2561 |
| <i>Morten Herget Christensen ; Diego Caviedes Nozal ; Ioannis Kavadas ; Pierre Pinson</i>   |      |
| <b>AN AMBIGUITY AVERSE APPROACH FOR TRANSMISSION EXPANSION PLANNING</b> .....   | 2567 |
| <i>Alexandre Moreira ; Goran Strbac ; Bruno Fanzeres</i>  |      |
| <b>INTELLIGENT MANAGEMENT OF BATTERY SYSTEM FOR ENERGY ARBITRAGE</b> .....  | 2573 |
| <i>Jonas V. De Souza ; Antonio E. C. Momesso ; Felipe M. Dos S. Monteiro ; Rodrigo B. Otto ; Eduardo N. Asada</i>   |      |
| <b>A REVIEW ON DYNAMIC WIRELESS CHARGING SYSTEMS</b> .....  | 2579 |
| <i>Davide De Marco ; Alberto Dolara ; Michela Longo</i>   |      |
| <b>TOWARDS ON-LINE PMU-BASED MODEL CALIBRATION FOR LOOK-AHEAD FREQUENCY ANALYSIS</b> .....  | 2584 |
| <i>Juan Quiroz ; Hector Chavez</i>  |      |
| <b>CORENTROPY-BASED FUSION STRATEGY FOR INCORPORATING PMU MEASUREMENTS INTO POWER SYSTEM STATE ESTIMATION</b> .....   | 2589 |
| <i>Larah Brüning Ascari ; Antonio Simões Costa ; Vladimiro Miranda</i>  |      |
| <b>SOLAR POWER RESOURCE ASSESSMENT USING LIGHT DETECTION AND RANGING DATA AND OPEN SOURCE GEOGRAPHIC INFORMATION SYSTEM</b> .....                                 | 2595 |
| <i>Ellen Jane G. Gulben ; Jeeng-Min Ling ; Dexter William L. Gulben ; Noel R. Estoperez</i>   |      |
| <b>A SPARSE GRID SCHEME FOR FAST TRANSIENT STABILITY SIMULATION WITH REDUCED REDUNDANCY</b> .....   | 2601 |
| <i>Yang Liu ; Kai Sun ; Bin Wang ; Rui Yao ; Wei Kang</i>   |      |
| <b>IMPACT OF RESIDENTIAL LOAD MODELS FOR OVERVOLTAGE PREVENTION STUDIES IN PV-RICH LV GRIDS</b> .....   | 2607 |
| <i>Fernando B. Dos Reis ; Kapil Dwadi ; Robert Foutney ; Reinaldo Tonkoski ; Timothy M. Hansen ; Mohammad Asif Iqbal Khan ; Sumit Paudyal</i>                     |      |
| <b>FREQUENCY STABILITY PROVISION FROM BATTERY ENERGY STORAGE SYSTEM CONSIDERING CASCADING FAILURE S WITH APPLICATIONS TO SEPARATION EVENTS IN AUSTRALIA</b> ..... | 2613 |
| <i>Ahvand Jalali ; Mehdi Ghazavi Dozein ; Pierluigi Mancarella</i>  |      |
| <b>DETERMINATION OF FEASIBLE POWER VARIABILITY RANGES IN ACTIVE DISTRIBUTION NETWORKS WITH UNCERTAIN GENERATION AND DEMAND</b> .....                              | 2619 |
| <i>Giancarlo Noto ; Veit Hagenmeyer ; Riccardo Remo Appino ; Gianfranco Chicco</i>  |      |
| <b>PREDICTIVE MODELING OF ELECTRICITY TRADING PRICES AND THE IMPACT OF INCREASING SOLAR ENERGY PENETRATION</b> .....  | 2625 |
| <i>Soumyo V. Chakraborty ; Sandeep K. Shukla</i>  |      |
| <b>TOWARDS SUPERVISORY PROTECTION USING ENERGY FUNCTIONS FOR RELAY MISOPERATIONS IN A STRESSED POWER SYSTEM DURING BLACKOUT</b> .....                             | 2631 |
| <i>Abhishek Banerjee ; Rajesh G. Kavasseri ; Mumim Bin Gani ; Sukumar Brahma</i>  |      |
| <b>TECHNO-ECONOMIC ANALYSIS OF HVAC, HVDC AND OFAC OFFSHORE WIND POWER CONNECTIONS</b> .....  | 2637 |
| <i>S. Hardy ; K. Van Brusselen ; S. Hendrix ; D. Van Hertem ; H. Ergun</i>  |      |
| <b>MINIMIZATION OF RADIO INTERFERENCE LEVELS IN A HYBRID TRANSMISSION LINE</b> .....  | 2643 |
| <i>Carlos Tejada-Martínez ; Fermin P. Espino-Cortes ; Aydogan Ozdemir ; Suat Ilhan</i>  |      |
| <b>LOSS OF COORDINATION IN A PROTECTION SCHEME DUE TO DG ASSESSED BY MEANS OF RELIABILITY ANALYSIS</b> .....  | 2648 |
| <i>Julián Valbuena G ; Andrés Pavas</i>   |      |
| <b>A COMBINATORIAL ALGORITHM FOR LARGE-SCALE POWER SYSTEM ISLANDING</b> .....   | 2654 |
| <i>Georgios Patsakis ; Shmuel Oren</i>  |      |
| <b>OPTIMAL OPERATION OF AGGREGATED INDUSTRIAL LOADS COUPLED WITH ENERGY STORAGE SYSTEM</b> .....  | 2660 |
| <i>Minsu Park ; Yunsun Jin ; Wonpoong Lee ; Dongjun Won</i>   |      |
| <b>OPTIMAL OPERATION STRATEGY FOR COMMUNITY-BASED PROSUMERS THROUGH COOPERATIVE P2P TRADING</b> .....   | 2666 |
| <i>Wonpoong Lee ; Daesoo Kim ; Yunsun Jin ; Minsu Park ; Dongjun Won</i>  |      |
| <b>TOWARD DATA-DRIVEN IDENTIFICATION OF ESSENTIAL FACTORS CAUSING SEASONAL CHANGE IN DAILY ELECTRICITY DEMAND CURVES</b> .....                                    | 2672 |
| <i>Nanae Kaneko ; Yasuhiro Hayashi ; Yu Fujimoto</i>  |      |

|  |      |
|--|------|
| <b>INTEGRATION OF CENTRALIZED AND LOCAL VOLTAGE CONTROL SCHEME IN DISTRIBUTION NETWORK TO REDUCE THE OPERATION OF MECHANICALLY SWITCHED DEVICES.....</b> | 2678 |
| <i>Salish Maharjan ; Ashwin M. Khambadkone ; Jimmy C.-H. Peng</i>  |      |
| <b>SUBGRADIENT METHODS FOR AVERAGING HOUSEHOLD LOAD PROFILES UNDER LOCAL PERMUTATIONS.....</b>   | 2684 |
| <i>Marcus Voß ; Brijnesh Jain ; Sahin Albayrak</i>   |      |
| <b>INFLUENCE OF MEASUREMENT SETUP ON THE EMISSION OF DEVICES IN THE FREQUENCY RANGE 2-150 KHZ.....</b>   | 2690 |
| <i>Daniel Agudelo-Martinez ; Andres Pavas ; Ana Maria Blanco ; Robert Stiegler ; Jan Meyer</i>   |      |
| <b>HARMONIC MODELLING OF LED LAMPS BY MEANS OF ADMITTANCE FREQUENCY COUPLING MATRICES.....</b>   | 2696 |
| <i>Adam John Collin ; Jiri Drapela ; Roberto Langella ; Alfredo Testa ; Sasa Z. Djokic ; Neville R. Watson</i>   |      |
| <b>DISTRIBUTION VOLTAGE REGULATION USING COMBINED LOCAL AND CENTRAL CONTROL BASED ON REAL-TIME DATA.....</b>   | 2702 |
| <i>Min-Seung Ko ; Sae-Hwan Lim ; Jae-Kyeong Kim ; Kyeon Hur</i>  |      |
| <b>SEQUENCE TO SEQUENCE DEEP LEARNING MODELS FOR SOLAR IRRADIATION FORECASTING.....</b>  | 2708 |
| <i>Bhaskar Pratim Mukhoty ; Vikas Maurya ; Sandeep Kumar Shukla</i>  |      |
| <b>SIMPLIFIED MODELS FOR FREQUENCY STUDIES IN ELECTRICAL POWER SYSTEMS.....</b>  | 2714 |
| <i>Francisco Casado-Machado ; Jose L. Martinez-Ramos ; Alejandro Marano-Marcolini</i>  |      |
| <b>IDENTIFICATION OF STABILITY DELAY MARGIN FOR LOAD FREQUENCY CONTROL SYSTEM WITH ELECTRIC VEHICLES AGGREGATOR USING REKASIOUS SUBSTITUTION.....</b>    | 2720 |
| <i>Ausnain Naveed ; Sahin Sönmez ; Saffet Ayasun</i>   |      |
| <b>RECEDING HORIZON ALGORITHM FOR DYNAMIC TRANSFORMER RATING AND ITS APPLICATION FOR REAL-TIME ECONOMIC DISPATCH.....</b>                                | 2726 |
| <i>Ildar Daminov ; Anton Prokhorov ; Raphael Caire ; Marie-Cecile Alvarez-Herault</i>  |      |
| <b>A BAYESIAN NETWORK FRAMEWORK FOR OPERATIONS OF CIRCUIT BREAKERS.....</b>  | 2732 |
| <i>Alberto Carboni ; Francesco Amigoni ; Khaled El Shawarby ; Enrico Ragaini ; Gabriele Perrone</i>  |      |
| <b>ELECTRIC STRESS IN POWER ELECTRONICS APPLICATIONS.....</b>  | 2737 |
| <i>A. Carboni ; K. Elshawarby ; G. M. Foglia ; R. Perini ; A. Di Gerlando ; E. Ragaini</i>   |      |
| <b>PERFORMANCE ASSESSMENT OF LINEARIZED OPF-BASED DISTRIBUTED REAL-TIME PREDICTIVE CONTROL.....</b>  | 2743 |
| <i>Rahul Gupta ; Fabrizio Sossan ; Mario Paolone</i>   |      |
| <b>IMPACT OF INERTIA DISTRIBUTION ON POWER SYSTEM STABILITY AND OPERATION.....</b>   | 2749 |
| <i>Bahman Alinezhad Osbouei ; Gareth A. Taylor ; Olivier Bronckart ; Johan Maricq ; Martin Bradley</i>   |      |
| <b>HVDC DEVELOPMENTS FOR THE ALL-ISLAND CYPRUS SYSTEM IN A PAN-EUROPEAN LONG-TERM PERSPECTIVE.....</b>   | 2755 |
| <i>A. L'Abbate ; R. Calisti</i>  |      |
| <b>ROBUST RESEARCH OF POWER OSCILLATIONS DAMPING CONTROLLER FOR HVDC INSERTED IN MESHED AC GRIDS.....</b>  | 2761 |
| <i>Yankai Xing ; Bogdan Marinescu ; Florent Xavier</i>   |      |
| <b>OPTIMAL CHARGING COORDINATION OF ELECTRIC VEHICLES CONSIDERING DISTRIBUTED ENERGY RESOURCES.....</b>  | 2767 |
| <i>Adrian-Toni Radu ; Mircea Eremia ; Lucian Toma</i>  |      |
| <b>ELECTRIC FIELD AND TEMPERATURE DISTRIBUTION ALONG THE POLYMER ROD TYPE SUSPENSION INSULATOR IN POLLUTED ENVIRONMENT.....</b>                          | 2773 |
| <i>Mirza Batalovii ; Halid Matoruga ; Mirza Matoruga ; Sead Berberovii</i>   |      |
| <b>FUEL-CELL BASED PROPULSION SYSTEMS FOR HYBRID RAILCARS.....</b>   | 2779 |
| <i>Michela Longo ; Morris Brenna ; Dario Zaninelli ; Massimo Ceraolo ; Giovanni Lutzenberger ; Davide Poli</i>   |      |
| <b>MATHEMATICAL DESCRIPTION OF A FUNDAMENTAL TRANSIENT ELECTRIC LOAD MODEL OF HOUSEHOLDS.....</b>  | 2785 |
| <i>Franz Christange ; Andreas Stadler ; Thomas Hamacher</i>  |      |
| <b>STRUCTURAL ANALYSIS AND IMPROVED REACTIVE POWER ALIGNMENT FOR SECONDARY VOLTAGE CONTROL.....</b>  | 2791 |
| <i>Allal El Moubarek Bouzid ; Bogdan Marinescu ; Guillaume Denis</i>   |      |
| <b>PMUS AND SCADA MEASUREMENTS IN POWER SYSTEM STATE ESTIMATION THROUGH BAYESIAN INFERENCE.....</b>  | 2797 |
| <i>Julio A. D. Massignan ; João B. A. London ; Carlos D. Maciel ; Michle Bessani ; Vladimiro Miranda</i>   |      |
| <b>SOLVING THE STOCHASTIC TRANSMISSION CAPACITY EXPANSION PLANNING PROBLEM BASED ON GENERALIZED PARTIAL TRANSMISSION DISTRIBUTION FACTORS.....</b>       | 2803 |
| <i>Victor H. Hinojosa ; Joaquín Sepúlveda</i>  |      |
| <b>LOAD FORECASTING BENCHMARK FOR SMART METER DATA.....</b>  | 2809 |
| <i>João Viana ; Ricardo J. Bessa ; João Sousa</i>  |      |
| <b>GRID SUPPORTING VSCS IN POWER SYSTEMS WITH VARYING INERTIA AND SHORT-CIRCUIT CAPACITY.....</b>  | 2815 |
| <i>George S. Misyris ; Jeanne A. Mermet-Guyennet ; Spyros Chatzivasileiadis ; Tilman Weckesser</i>   |      |
| <b>MULTI-OBJECTIVE OPTIMIZATION OF URBAN MICROGRID ENERGY SUPPLY ACCORDING TO ECONOMIC AND ENVIRONMENTAL CRITERIA.....</b>                               | 2821 |
| <i>N. Cannata ; M. Cellura ; S. Longo ; F. Montana ; E. Riva Sanseverino ; Q. L. Luu ; N. Q. Nguyen</i>  |      |

|   |      |
|---|------|
| <b>COMPARISON OF TWO SCHEMES FOR CLOSED-LOOP DECENTRALIZED FREQUENCY CONTROL AND OVERLOAD ALLEVIATION</b> .....   | 2827 |
| <i>Oleg O. Khamisov ; Tatiana Chernova ; Janusz W. Bialek</i>   |      |
| <b>A TRANSMISSION SYSTEM FRIENDLY MICRO-GRID: OPTIMISING ACTIVE POWER LOSSES</b> .....  | 2833 |
| <i>Thomas Krechel ; Francisco Sanchez ; Francisco Gonzalez-Longatt ; Harold R. Chamorro ; Jose Luis Rueda</i>   |      |
| <b>TECHNO-ECONOMIC PLANNING FRAMEWORK OF A HOUSEHOLD MICROGRID WITH HYBRID ENERGY STORAGE SYSTEM</b> .....  | 2839 |
| <i>Jeeng-Min Ling ; Meng-Hui Lim ; Ming-Tsung Tsai</i>  |      |
| <b>HARDWARE-IN-THE-LOOP SIMULATION OF A BATTERY ENERGY STORAGE SYSTEM AND EXTERNAL STORAGE CONTROLLER TO PROVIDE PRIMARY CONTROL</b> .....                  | 2845 |
| <i>Marvin Albrecht ; Christoph Strunck ; Christian Rehtanz</i>  |      |
| <b>OPTIMIZATION OF FREQUENCY CONTROLLER PARAMETERS OF A BESS BY CONSIDERING RATE OF CHANGE CONSTRAINTS</b> .....  | 2849 |
| <i>Francisco Sánchez ; Francisco Gonzalez-Longatt</i>   |      |
| <b>TECHNO-ECONOMIC ASSESSMENT OF EV CHARGING INFRASTRUCTURE DEVELOPMENT IN BRAZILIAN UNIVERSITIES</b> .....   | 2855 |
| <i>Wanessa Guedes ; José Carlos Farias ; Bruno Dias ; Leonardo De Oliveira ; Matheus Souza ; José Luiz Pereira ; Jairo Quirós-Tortós</i>                    |      |
| <b>TWO-STAGE STOCHASTIC SIZING OF A RURAL MICRO-GRID BASED ON STOCHASTIC LOAD GENERATION</b> .....  | 2861 |
| <i>Nicolo' Stevanato ; Francesco Lombardi ; Emanuela Colombo ; Sergio Balderrama ; Sylvain Quoilin</i>  |      |
| <b>REACTIVE POWER PROVISION WITH DISTRIBUTED ENERGY RESOURCES: LIMITATIONS, POTENTIALS AND LOSSES</b> .....   | 2867 |
| <i>Hartmudt Köppe ; Merten Schuster ; Bernd Engel ; Robin Grab</i>  |      |
| <b>A CLOSE-TO-REAL-TIME ENERGY MANAGEMENT SYSTEM FOR SMART RESIDENTIAL BUILDINGS</b> .....  | 2873 |
| <i>M. Ali Fotouhi Ghazvini ; David Steen ; Le Anh Tuan</i>  |      |
| <b>INTEGRATED ZONAL-EXCHANGE AND NODAL-FLOW CLEARING MODEL IN MULTI-ZONAL SPOT ELECTRICITY MARKETS</b> .....  | 2879 |
| <i>Andreas Vlachos ; Pandelis Biskas</i>  |      |
| <b>EFFECT OF EXTENSIVE CABLING ON EFFICIENCY OF RESONANT EARTHING APPLIED IN MEDIUM-VOLTAGE DISTRIBUTION NETWORKS: A HUNGARIAN CASE STUDY</b> .....         | 2885 |
| <i>B. Hartmann ; I. Vokony ; I. Táci ; J. Kiss</i>  |      |
| <b>ADVANCED LOCAL VOLTAGE CONTROL THROUGH POLYNOMIAL P-VAR FUNCTIONS</b> .....  | 2891 |
| <i>Carsten Heinrich ; Charalampos Ziras ; Henrik W. Bindner</i>   |      |
| <b>A MARKOV PROCESS APPROACH TO ENSEMBLE CONTROL OF SMART BUILDINGS</b> .....   | 2897 |
| <i>Roman Pop ; Ali Hassan ; Kenneth Bruninx ; Michael Chertkov ; Yury Dvorkin</i>   |      |
| <b>NANOGIDS WITH RENEWABLE SOURCES, ELECTRICAL STORAGE AND VEHICLE-TO-HOME SYSTEMS IN THE HOUSEHOLD SECTOR: ANALYSIS FOR A SINGLE-FAMILY DWELLING</b> ..... | 2903 |
| <i>Stefano Bracco ; Federico Delfino ; Giorgio Piazza ; Federica Foiaelli ; Michela Longo</i>   |      |
| <b>IMPACT OF VARYING SHARES OF DISTRIBUTED ENERGY RESOURCES ON VOLTAGE STABILITY IN ELECTRIC POWERSYSTEMS</b> .....   | 2909 |
| <i>Sebastian Liemann ; Lena Robitzky ; Christian Rehtanz</i>  |      |
| <b>COMPARISON OF MULTI-MEGAWATT LVRT TESTING SETUPS FOR THE CERTIFICATION OF WIND TURBINES</b> .....  | 2915 |
| <i>Jonas Bielemeier ; Anica Frehn ; Antonello Monti ; Richard Frühmann ; Fritz Santjer</i>  |      |
| <b>AN MILP APPROACH FOR DISTRIBUTION GRID TOPOLOGY IDENTIFICATION USING INVERTER PROBING</b> .....  | 2921 |
| <i>Sina Taheri ; Vassilis Kekatos ; Guido Cavraro</i>   |      |
| <b>THE IMPACT OF ELECTRIC VEHICLES AGGREGATOR ON THE STABILITY REGION OF MICRO-GRID SYSTEM WITH COMMUNICATION TIME DELAY</b> .....                          | 2927 |
| <i>Hakan Gündüz ; Sahin Sönmez ; Saffet Ayasun</i>  |      |
| <b>CLUSTERING HOUSEHOLD ELECTRICAL LOAD PROFILES USING ELASTIC SHAPE ANALYSIS</b> .....   | 2933 |
| <i>Sutanoy Dasgupta ; Anuj Srivastava ; Jose Cordova ; Reza Arghandeh</i>   |      |
| <b>A DATA-DRIVEN APPROACH TO GRID IMPEDANCE IDENTIFICATION FOR IMPEDANCE-BASED STABILITY ANALYSIS UNDER DIFFERENT FREQUENCY RANGES</b> .....                | 2939 |
| <i>Chendan Li ; Marta Molinas ; Olav Bjarte Fosso ; Nan Qin ; Lin Zhu</i>   |      |
| <b>IMPACT OF SMART INVERTER FUNCTIONS ON DYNAMIC STEP VOLTAGE REGULATOR SETTINGS FOR DISTRIBUTION VOLTAGE CONTROL</b> .....                                 | 2945 |
| <i>H. M. Mesbah Maruf ; Badrul H. Chowdhury</i>   |      |
| <b>EXPLORATION OF MACHINE LEARNING METHODS FOR PREDICTING THE OPERATION SCHEDULE OF A COMBINED HEAT AND POWER PLANT</b> .....                               | 2951 |
| <i>Johannes Mast ; Stefan Rüdle ; Joachim Gerlach ; Oliver Bringmann</i>  |      |
| <b>MODEL PREDICTIVE CONTROL OF VSC-HVDC EMBEDDED INTO AC GRID SUBJECT TO STATE AND CONTROL CONSTRAINTS</b> .....  | 2957 |
| <i>E. Thau ; E. Kamal ; B. Marinescu ; G. Denis</i>   |      |
| <b>LOAD DISPATCH OPTIMIZATION USING DYNAMIC RATING AND OPTIMAL LIFETIME UTILIZATION OF TRANSFORMERS</b> .....   | 2963 |
| <i>Nicola Viafora ; Joachim Holbøll ; Syed Hamza H. Kazmi ; Thomas H. Olesen ; Troels S. Sørensen</i>   |      |

|  |      |
|--|------|
| <b>ISLANDING DETECTION BASED ON ARTIFICIAL NEURAL NETWORK AND S-TRANSFORM FOR DISTRIBUTED GENERATORS</b> .....                                 | 2969 |
| <i>Thiago S. Menezes ; Denis V. Coury ; Ricardo A. S. Fernandes</i>  |      |
| <b>ENERGY STORAGE IN MADEIRA, PORTUGAL: CO-OPTIMIZING FOR ARBITRAGE, SELF-SUFFICIENCY, PEAK SHAVING AND ENERGY BACKUP</b> .....                | 2975 |
| <i>Md Umar Hashmi ; Lucas Pereira ; Ana Bušić</i>  |      |
| <b>CRITICAL CLEARING TIME CALCULATION USING ENERGY FUNCTIONS FOR VSC BASED GRID CONNECTED PV GENERATORS WITH PQ CONTROL</b> .....              | 2981 |
| <i>Indla Rajitha Sai Priyamvada ; Sarasij Das</i>  |      |
| <b>POWER OSCILLATION MONITORING USING STATISTICAL LEARNING METHODS</b> .....   | 2987 |
| <i>Hallvar Haugdal ; Kjetil Uhlen</i>  |      |
| <b>DEEP LEARNING FOR POWER SYSTEM SECURITY ASSESSMENT</b> .....  | 2993 |
| <i>José-Maria Hidalgo Arteaga ; Fiodar Hancharou ; Florian Thams ; Spyros Chatzivasilieadis</i>  |      |
| <b>AN ENERGY SAVING MANAGEMENT STRATEGY FOR BATTERY-AIDED SHIP PROPULSION SYSTEMS</b> .....  | 2999 |
| <i>Luisa Alfieri ; Fabio Mottola ; Mario Pagano</i>  |      |
| <b>OPTIMAL PLANNING AND OPERATION SCHEDULING OF BATTERY STORAGE UNITS IN DISTRIBUTION SYSTEMS</b> .....  | 3005 |
| <i>Hamidreza Mirtaheeri ; Alessandro Bortoletto ; Maurizio Fantino ; Andrea Mazza ; Mousa Marzband</i>   |      |
| <b>MARKET POWER IN THE PRESENCE OF CARBON TAXES IN ELECTRICITY MARKETS</b> .....   | 3011 |
| <i>Ahmad H. Milyani ; Daniel S. Kirschen ; Jesus E. Contreras-Ocaña</i>  |      |
| <b>PQ CLASSIFICATION BY WAY OF PARALLEL COMPUTING - A SENSITIVITY ANALYSIS FOR A REAL-TIME LSTM APPROACH USING WAVEFORM AND RMS DATA</b> ..... | 3017 |
| <i>Adrian Eisenmann ; Tim Streubel ; Krzysztof Rudion</i>  |      |
| <b>A CONGESTION FORECAST FRAMEWORK FOR DISTRIBUTION SYSTEMS WITH HIGH PENETRATION OF PVS AND PEVS</b> .....                                    | 3023 |
| <i>Ankur Srivastava ; David Steen ; Le Anh Tuan ; Ola Carlson</i>  |      |
| <b>ANALYSES OF ELECTRIFICATION AND BATTERY AGEING PROCESSES IN A REAL OFFGRID HYBRID MICROGRID</b> .....                                       | 3029 |
| <i>O. Rigovacca ; S. Polimeni ; G. Manzolini ; S. Leva ; P. Raboni</i>   |      |
| <b>DETECTION AND LOCALIZATION OF NON-TECHNICAL LOSSES IN DISTRIBUTION SYSTEMS WITH FUTURE SMART METERS</b> .....                               | 3035 |
| <i>Mattias Persson ; Anders Lindskog</i>   |      |
| <b>ESTIMATING THE VALUE OF SECOND LIFE BATTERIES FOR RESIDENTIAL PROSUMERS</b> .....   | 3041 |
| <i>Carmen Bas Doménech ; Miguel Heleno</i>   |      |
| <b>APPLYING STEINMETZ CIRCUIT DESIGN TO MITIGATE VOLTAGE UNBALANCE USING DISTRIBUTED SOLAR PV</b> .....  | 3047 |
| <i>Mengqi Yao ; Ian A. Hiskens ; Johanna L. Mathieu</i>  |      |
| <b>CONTRIBUTION OF ENERGY STORAGE TO SYSTEM ADEQUACY AND ITS VALUE IN THE CAPACITY MARKET</b> .....  | 3053 |
| <i>Stefan Borozan ; Michael P. Evans ; Goran Strbac ; Tiago Rodrigues</i>  |      |
| <b>QUANTIFYING THE FLEXIBILITY BY ENERGY STORAGE SYSTEMS IN DISTRIBUTION NETWORKS WITH LARGE-SCALE VARIABLE RENEWABLE ENERGY SOURCES</b> ..... | 3059 |
| <i>Marco R. M. Cruz ; Desta Z. Fitiwi ; Sérgio F. Santos ; João P. S. Catalão</i>  |      |
| <b>DEEP LEARNING BASED FORECASTING OF INDIVIDUAL RESIDENTIAL LOADS USING RECURRENCE PLOTS</b> .....  | 3065 |
| <i>Roozbeh Rajabi ; Abouzar Estebsari</i>  |      |
| <b>IMPACT OF OPERATIONAL DECISIONS AND SIZE OF BATTERY ENERGY STORAGE SYSTEMS ON DEMAND CHARGE REDUCTION</b> .....                             | 3070 |
| <i>Roozbeh Karandeh ; Tumininu Lawanson ; Valentina Cecchi</i>   |      |
| <b>TWO VARIABLE TIME-STEP ALGORITHMS FOR SIMULATION OF TRANSIENTS</b> .....  | 3076 |
| <i>W. Nzale ; J. Mahseredjian ; I. Kocar ; X. Fu ; C. Dufour</i>   |      |
| <b>STATISTICAL CRITERIA FOR EVALUATION OF DISTRIBUTION SYSTEM STATE ESTIMATORS</b> .....   | 3082 |
| <i>Thiago R. Fernandes ; Leonardo R. Fernandes ; Luis F. Ugarte ; Rafael S. Da Silva ; Madson C. De Almeida</i>                                |      |
| <b>EQUIVALENT DYNAMIC MODEL OF ACTIVE DISTRIBUTION NETWORKS FOR LARGE VOLTAGE DISTURBANCES</b> .....   | 3088 |
| <i>Nuno Fulgêncio ; Carlos Moreira ; Leonel Carvalho ; João Peças Lopes</i>  |      |
| <b>FAST CALCULATION OF THE TRANSFER CAPABILITY MARGINS</b> .....   | 3094 |
| <i>Mazhar Ali ; Elena Gryazina ; Konstantin S. Turitsyn</i>  |      |
| <b>A NOVEL PLANNING METHOD FOR MULTI-SCALE INTEGRATED ENERGY SYSTEM</b> .....  | 3100 |
| <i>Jingjie Yang ; Wei Sun ; Gareth Harrison ; James Robertson</i>  |      |
| <b>HARDWARE IN THE LOOP TESTING OF BATTERY-LESS HYBRID SYSTEMS FOR OFF-GRID POWER SUPPLY</b> .....   | 3106 |
| <i>Nikolaos Ntavarinos ; Pamos Kotsampopoulos ; Dimitris T. Lagos ; Nikos Hatzigiorgiou</i>  |      |
| <b>ELECTRICITY AND GAS NETWORK EXPANSION PLANNING: AN ADMM-BASED DECOMPOSITION APPROACH</b> .....  | 3112 |
| <i>Yinghui Nie ; Meisam Farrokhifar ; David Pozo</i>   |      |
| <b>INTENTIONAL ISLAND AND DYNAMIC ANALYSIS OF A MICROGRID</b> .....  | 3118 |
| <i>Wandry R. Faria ; Mario Oleskovicz ; Denis V. Coury ; Rodrigo B. Otto ; Benvindo R. Pereira</i>   |      |

|   |      |
|---|------|
| <b>A GUIDELINE FOR MODELING VOLTAGE AND FREQUENCY CONTROLS IN AC MICROGRIDS: THE INFLUENCE OF LINE IMPEDANCE ON TRANSIENT TIME</b> .....          | 3124 |
| <i>Maryam Majidi ; Ahmad Ali Nazeri ; Federico Martin Ibanez ; David Pozo</i>   |      |
| <b>EXPLORATION OF ARTIFICIAL INTELLIGENCE APPROACHES FOR THE INTEGRATION OF E-MOBILITY ENERGY STORAGE SYSTEMS INTO VIRTUAL POWER PLANTS</b> ..... | 3130 |
| <i>Stefan Rüdle ; Johannes Mast ; Joachim Gerlach ; Oliver Bringmann</i>  |      |
| <b>CLOUD-AC-OPF: MODEL REDUCTION TECHNIQUE FOR MULTI-SCENARIO OPTIMAL POWER FLOW VIA CHANCE-CONSTRAINED OPTIMIZATION</b> .....                    | 3136 |
| <i>Vladimir Frolov ; Line Roald ; Michael Chertkov</i>  |      |
| <b>COORDINATION BETWEEN AN AGGREGATOR AND DISTRIBUTION OPERATOR TO ACHIEVE NETWORK-AWARE LOAD CONTROL</b> .....                                   | 3142 |
| <i>Stephanie C. Ross ; Necmiye Ozay ; Johanna L. Mathieu</i>  |      |
| <b>SPATIAL-TEMPORAL ESTIMATION OF THE PV MARKET POTENTIAL IN SUBAREAS</b> .....   | 3148 |
| <i>J. Villavicencio ; A. Padilha-Feltrin ; J. D. Melo</i>   |      |
| <b>MODIFIED CARBON TRADING BASED LOW-CARBON ECONOMIC DISPATCH STRATEGY FOR INTEGRATED ENERGY SYSTEM WITH CCHP</b> .....                           | 3154 |
| <i>Yajing Li ; Wenhui Tang ; Qinghua Wu</i>   |      |
| <b>A SURVEY ON SIMULATION OF POWER SYSTEMS RESILIENCE UNDER EXTREME WEATHER EVENTS</b> .....  | 3160 |
| <i>Izgh Hadachi ; Sahin Albayrak</i>  |      |
| <b>COMBINED PLANNING OF MEDIUM AND LOW VOLTAGE GRIDS</b> .....  | 3166 |
| <i>Roman Bolgaryn ; Alexander Scheidler ; Martin Braun</i>  |      |
| <b>ROLE OF FLEXIBLE DEMAND IN SUPPORTING MARKET-BASED INTEGRATION OF RENEWABLE GENERATION</b> .....   | 3172 |
| <i>Gerasimos Takis-Defteraios ; Dimitrios Papadaskalopoulos ; Yujian Ye ; Rodrigo Moreno</i>  |      |
| <b>OPTIMAL BESS SCHEDULING STRATEGY IN MICROGRIDS BASED ON GENETIC ALGORITHMS</b> .....   | 3178 |
| <i>Dorian-Octavian Sidea ; Lucian Toma ; Mihai Sanduleac ; Irina-Ioana Picioroaga ; Valentin-Adrian Boicea</i>                                    |      |
| <b>REDUCING THE UNFAIRNESS OF COORDINATED INVERTER DISPATCH IN PV-RICH DISTRIBUTION NETWORKS</b> .....  | 3184 |
| <i>Peter Lusis ; Lachlan L. H. Andrew ; Shantanu Chakraborty ; Ariel Liebman ; Guido Tack</i>   |      |
| <b>CONSUMER HEDGING AGAINST PRICE VOLATILITY UNDER UNCERTAINTY</b> .....  | 3190 |
| <i>Shantanu Chakraborty ; Milos Cvetkovic ; Kyri Baker ; Remco Verzijlbergh ; Zofia Lukszo</i>  |      |
| <b>MITIGATION ANALYSIS OF MV DISTRIBUTION NETWORK CONSTRAINTS THANKS TO A SELF-CONSUMPTION POLICY FOR PHOTOVOLTAIC DISTRIBUTED UNITS</b> .....    | 3196 |
| <i>Valentin Pailloux ; Bruno Francois</i>   |      |
| <b>MASSIVE INTEGRATION OF WIND POWER AT DISTRIBUTION LEVEL SUPPORTED BY BATTERY ENERGY STORAGE SYSTEMS</b> .....                                  | 3202 |
| <i>Juan M. Lujano-Rojas ; José A. Domínguez-Navarro ; José M. Yusta ; Gerardo J. Osório ; Mohamed Lotfi ; João P. S. Catalão</i>                  |      |
| <b>PROVISION OF FREQUENCY SUPPORT BY WIND POWER PLANTS: ASSESSMENT OF COMPLIANCE WITH GRID CODES</b> .....  | 3208 |
| <i>Ayman B. Attya</i>   |      |
| <b>A THREE-STAGE MULTI-YEAR TRANSMISSION EXPANSION PLANNING USING HEURISTIC, METAHEURISTIC AND DECOMPOSITION TECHNIQUES</b> .....                 | 3214 |
| <i>Luiz Eduardo De Oliveira ; J. T. Saraiva ; P. Vilaça Gomes ; Francisco Damasceno Freitas</i>   |      |
| <b>EV SMART CHARGING IN COLLECTIVE RESIDENTIAL BUILDINGS: THE BIENVENU PROJECT</b> .....  | 3220 |
| <i>Marc Petit ; Martin Hennebel</i>   |      |
| <b>A DISTRIBUTED OPTIMAL POWER FLOW FOR SECONDARY CONTROL OF HYBRID AC/DC NETWORKS</b> .....  | 3226 |
| <i>Niklas Wehbring ; Daniel Schema ; Falko Wähler ; Albert Moser</i>  |      |
| <b>DYNAMIC SYSTEM PERFORMANCE ANALYSIS OF A NOVEL GRID CONNECTION TOPOLOGY FOR OFFSHORE WIND FARMS USING MMC-HVDC TRANSMISSION</b> .....          | 3232 |
| <i>P. Lozada Ayala ; J. L. Rueda Torres ; C. G. A. Koreman ; M. A. M. M. Van Der Meijden</i>  |      |
| <b>MEASUREMENT-BASED INERTIA ESTIMATION METHOD CONSIDERING SYSTEM REDUCTION STRATEGIES AND DYNAMIC EQUIVALENTS</b> .....                          | 3238 |
| <i>Guido Rossetto Moraes ; Fabio Pozzi ; Valentin Ilea ; Alberto Berizzi ; Enrico Maria Carlini ; Giorgio Giannuzzi ; Roberto Zaottini</i>        |      |
| <b>CONDUCTOR TEMPERATURE ESTIMATION UNDER UNCERTAIN EXTERNAL CONDITIONS USING A TEMPERATURE-DEPENDENT POWER FLOW</b> .....                        | 3244 |
| <i>Mahbubur Rahman ; Valentina Cecchi</i>   |      |
| <b>A COMMUNITY MICROGRID CONTROL STRATEGY TO DELIVER BALANCING SERVICES</b> .....   | 3250 |
| <i>Daniele Menniti ; Anna Pinnarelli ; Nicola Sorrentino ; Pasquale Vizza ; Giuseppe Barone</i>   |      |
| <b>PREDICTING TRANSMISSION LINE CONGESTION IN ENERGY SYSTEMS WITH A HIGH SHARE OF RENEWABLES</b> .....  | 3256 |
| <i>Philipp Staudt ; Benjamin Rausch ; Johannes Gärtner ; Christof Weinhardt</i>   |      |
| <b>EXPLORATORY STUDY TOWARDS DYNAMIC EQUIVALENT MODELLING OF HYBRID RENEWABLE ENERGY SOURCE PLANT BASED ON HISTORICAL PRODUCTION DATA</b> .....   | 3262 |
| <i>Ana Radovanović ; Jovica V. Milanović</i>  |      |
| <b>DEMAND RESPONSE PROGRAM IMPLEMENTATION FOR DAY-AHEAD POWER SYSTEM OPERATION</b> .....  | 3268 |
| <i>Mohamed Lotfi ; P. S. João Catalão ; Mohammad S. Javadi ; Ali E. Nezhad ; Miadreza Shafie-Khah</i>   |      |



|  |      |
|--|------|
| <b>ASSESSMENT OF BEST PRACTICES FOR MITIGATION OF RAPID VOLTAGE CHANGE DUE TO TRANSFORMER INRUSH</b> .....   | 3274 |
| <i>Gaurav Singh ; Carl Miller ; William Howe</i>   |      |
| <b>EVALUATING STRATEGIES FOR DECARBONISING THE TRANSPORT SECTOR IN GREAT BRITAIN</b> .....   | 3280 |
| <i>Peng Fu ; Danny Pudjianto ; Xi Zhang ; Goran Strbac</i>   |      |
| <b>IGDT OPPORTUNITY METHOD IN THE TRADING FRAMEWORK OF RISK-SEEKER DEMAND RESPONSE AGGREGATORS</b> .....   | 3286 |
| <i>Morteza Vahid-Ghavidel ; João P. S. Catalão ; Miadreza Shafie-Khah ; Sahar Seyyedeh Barhagh ; Behnam Mohammadi-Ivatloo</i>                              |      |
| <b>IMPACT OF ENERGY STORAGE ON MARKET-BASED GENERATION INVESTMENT PLANNING</b> .....   | 3292 |
| <i>Temitayo Oderinwale ; Yujian Ye ; Dimitrios Papadaskalopoulos ; Goran Strbac</i>  |      |
| <b>DYNAMIC THERMAL RATING FOR EFFICIENT MANAGEMENT OF POST-CONTINGENCY CONGESTIONS</b> .....   | 3298 |
| <i>D. Fang ; J. Gunda ; M. Zou ; G. Harrison ; S. Z. Djokic ; Alfredo Vaccaro</i>  |      |
| <b>STUDY ON TOV AFTER FAULT RECOVERY IN VSC BASED HVDC SYSTEMS</b> .....   | 3304 |
| <i>Hani Saad ; Sébastien Denetière</i>   |      |
| <b>OPTIMAL OPERATION OF DISTRIBUTION NETWORKS THROUGH CLEARING LOCAL DAY-AHEAD ENERGY MARKET</b> .....   | 3310 |
| <i>Salah Bahramara ; Pouria Sheikhhahmadi ; Mohamed Lotfi ; João P. S. Catalão ; Sérgio F. Santos ; Miadreza Shafie-Khah</i>                               |      |
| <b>USER-COMFORT ORIENTED BIDDING STRATEGY FOR ELECTRIC VEHICLE PARKING LOTS</b> .....  | 3316 |
| <i>Ibrahim Sengör ; Alper Çiçek ; Ayse Kübra Erenoglu ; Ozan Erdiñç ; Akin Tascikaraoglu ; João P. S. Catalão</i>  |      |
| <b>CONTROL OF INTERLINKING BIDIRECTIONAL CONVERTER IN AC/DC HYBRID MICROGRID OPERATING IN STAND-ALONE MODE</b> .....                                       | 3322 |
| <i>Abdullah Sajid ; Reza Sabzehgar ; Mohammad Rasouli ; Poria Fajri</i>  |      |
| <b>VOLTAGE SAG STATE ESTIMATION USING COMPRESSIVE SENSING IN POWER SYSTEMS</b> .....   | 3328 |
| <i>Jairo Blanco-Solano ; Johann F. Petit-Suárez ; Gabriel Ordóñez-Plata ; Nelson Kagan</i>   |      |
| <b>IMPACT ON POWER SYSTEM FREQUENCY DYNAMICS FROM AN HVDC TRANSMISSION SYSTEM WITH CONVERTER STATIONS CONTROLLED AS VIRTUAL SYNCHRONOUS MACHINES</b> ..... | 3334 |
| <i>Francesco Palombi ; Luigi Piegari ; Salvatore D'Arco ; Atsede G. Endegnanew ; Jon Are Suul</i>  |      |
| <b>OPTIMAL OPERATION OF A SMART MULTI-ENERGY NEIGHBORHOOD</b> .....  | 3340 |
| <i>Mustafa Ata ; Ayse Kübra Erenoglu ; Ibrahim Sengör ; Ozan Erdiñç ; Akin Tascikaraoglu ; João P. S. Catalão</i>  |      |
| <b>FLEXIBLE CO-OPERATION OF TCSC AND CORRECTIVE TOPOLOGY CONTROL UNDER WIND UNCERTAINTY: AN INTERVAL-BASED ROBUST APPROACH</b> .....                       | 3346 |
| <i>Ahmad Nikoobakht ; Jamshid Aghaei ; Mohamed Lotfi ; João P. S. Catalão ; Gerardo J. Osório ; Miadreza Shafie-Khah</i>                                   |      |
| <b>ITERATIVELY-COUPLED CO-SIMULATION FRAMEWORK FOR UNBALANCED TRANSMISSION-DISTRIBUTION SYSTEM</b> .....   | 3352 |
| <i>Gayathri Krishnamoorthy ; Anamika Dubey ; P. K. Sen</i>   |      |
| <b>MULTI-OBJECTIVE OPTIMISATION OF AN ACTIVE DISTRIBUTION SYSTEM USING NORMALISED NORMAL CONSTRAINT METHOD</b> .....                                       | 3358 |
| <i>M. Saffari ; M. Saeed Misaghian ; D. Flynn ; M. Kia ; V. Vahidinasab ; M. Lotfi ; João P. S. Catalão ; M. Shafie-Khah</i>                               |      |
| <b>TWO-STAGE STOCHASTIC MIXED INTEGER PROGRAMMING APPROACH FOR OPTIMAL SCUC BY ECONOMIC DR MODEL</b> .....   | 3364 |
| <i>Mohsen Kia ; Reza Etamad ; Alireza Heidari ; Mohamed Lotfi ; João P. S. Catalão ; Miadreza Shafie-Khah ; Gerardo J. Osório</i>                          |      |
| <b>RELIABLE AND ENVIRONMENTAL ECONOMIC DISPATCH IN A MICROGRID WITH RENEWABLE ENERGY SOURCES</b> .....   | 3370 |
| <i>Mehrdad Tarafdar Haghi ; Saeed Pouyafar ; Farnaz Sohrabi ; Ayda Shaker ; Morteza Vahid-Ghavidel ; João P. S. Catalão ; Miadreza Shafie-Khah</i>         |      |
| <b>LEARNING FOR DC-OPF: CLASSIFYING ACTIVE SETS USING NEURAL NETS</b> .....  | 3376 |
| <i>Deepjyoti Deka ; Sidhant Misra</i>  |      |
| <b>ASSESSING IMPACT OF PV SYSTEMS ON CENTRALISED GENERATION</b> .....  | 3382 |
| <i>Morris Brenna ; Alessandro Corradi ; Federica Foiadelli ; Michela Longo</i>   |      |
| <b>OPTIMAL SCHEDULING OF GENERATORS AND BESS USING FORECASTING IN POWER SYSTEM WITH EXTREMELY LARGE PHOTOVOLTAIC GENERATION</b> .....                      | 3388 |
| <i>Rajitha Udawalpola ; Taisuke Masuta ; Hideaki Ohtake ; Joao Gari Da Silva Fonseca</i>   |      |
| <b>PROBABILISTIC VOLTAGE SECURITY REGION BASED ON MONTE CARLO RELIABILITY EVALUATION</b> .....   | 3394 |
| <i>Nicolas A. R. L. Netto ; Carmen L. T. Borges</i>  |      |
| <b>ANALYTICAL SOLUTIONS FOR POWER FLOW EQUATIONS BASED ON THE MULTIVARIATE QUOTIENT-DIFFERENCE METHOD</b> .....  | 3400 |
| <i>Chengxi Liu ; Claus Leth Bak ; Yongli Zhu ; Kai Sun</i>   |      |
| <b>GROUND FAULT ANALYSIS IN A MICROGRID SCENARIO</b> .....   | 3406 |
| <i>A. Dolara ; E. Ogliaari ; P. Raboni</i>   |      |
| <b>OVERVIEW ON PHOTOVOLTAIC INSPECTIONS PROCEDURE BY MEANS OF UNMANNED AERIAL VEHICLES</b> .....   | 3411 |
| <i>Alessandro Niccolai ; Alessandro Gandelli ; Francesco Grimaccia ; Riccardo Zich ; Sonia Leva</i>  |      |
| <b>ANALYSIS OF VIBRATION SIGNALS OF HUV SHUNT REACTOR BASED ON CRP AND RQA</b> .....   | 3417 |
| <i>Xuan Chen ; Xincheng Pan ; Zhenyao Liu ; Hongzhong Ma</i>   |      |
| <b>APPLICATION OF EMPIRICAL WAVELET TRANSFORM IN VIBRATION SIGNAL ANALYSIS OF UHV SHUNT REACTOR</b> .....  | 3422 |
| <i>Jiang Ning ; Hao Baoxing ; Zhao Ruoyu ; Ma Hongzhong ; Xu Lei ; Li Li</i>   |      |

|  |      |
|--|------|
| <b>SEAMLESS GRID: AN OFF-CHAIN MODEL PROPOSAL FOR SCALABLE P2P ELECTRICITY MARKETS AND GRIDS MANAGEMENT</b> .....                              | 3427 |
| <i>Fabrizio Bruno Armani ; Francesco Grimaccia ; Sonia Leva ; Marco Mussetta</i>   |      |
| <b>MINUTE AHEAD WIND SPEED FORECASTING USING A GAUSSIAN PROCESS AND FUZZY ASSIMILATION</b> .....   | 3433 |
| <i>Miltiadis Alamaniotis ; Georgios Karagiannis</i>  |      |
| <b>INTRA-DAY FORECASTING OF BUILDING-INTEGRATED PV SYSTEMS FOR POWER SYSTEMS OPERATION USING ANN ENSEMBLE</b> .....                            | 3439 |
| <i>Gabriel Mendonça De Paiva ; Sergio Pires Pimentel ; Enes Gonçalves Marra ; Bernardo Pinheiro De Alvarenga ; Marco Mussetta ; Sonia Leva</i> |      |
| <b>LOAD MODELING AND SCHEDULING OPTIMIZATION FOR ENERGY SHARING IN PROSUMERS NETWORK</b> .....   | 3444 |
| <i>Matteo Barsanti ; Marco Mussetta</i>  |      |
| <b>PV POWER FORECASTING IMPROVEMENT BY MEANS OF A SELECTIVE ENSEMBLE APPROACH</b> .....  | 3450 |
| <i>Sonia Leva ; Marco Mussetta ; Alfredo Nespoli ; Emanuele Ogliari</i>  |      |
| <b>DEEP LEARNING APPLICATION TO NON-INTRUSIVE LOAD MONITORING</b> .....  | 3455 |
| <i>Nguyen Viet Linh ; Pablo Arboleya</i>   |      |
| <b>AN OPTIMIZATION MODEL FOR AIRPORT INFRASTRUCTURES IN SUPPORT TO ELECTRIC AIRCRAFT</b> .....   | 3460 |
| <i>Francesco Salucci ; Lorenzo Trainelli ; Roberto Faranda ; Michela Longo</i>   |      |
| <b>A METAMODEL FOR MULTI-UTILITIES ASSET MANAGEMENT</b> .....  | 3465 |
| <i>Alessandro Bosisio ; Davide Della Giustina ; Stefano Fratti ; Alessio Dedè ; Stefano Gozzi</i>  |      |
| <b>A HYBRID ANALYSIS APPROACH FOR TRANSIENT STABILITY ASSESSMENT IN POWER SYSTEMS</b> .....  | 3469 |
| <i>Michael Kyesswa ; Hüseyin K. Cakmak ; Lutz Gröll ; Uwe Kühnappel ; Veit Hagenmeyer</i>  |      |
| <b>RESS INTEGRATION AND TRANSMISSION EXPANSION PLANNING CONSIDERING LOAD SHEDDING COSTS</b> .....  | 3475 |
| <i>Catalina A. Sima ; M. O. Popescu ; C. L. Popescu ; G. Lazaroiu</i>  |      |
| <b>IMPLEMENTATION OF PM STEP SKEW TECHNIQUE TO OPTIMUM DESIGN OF A TRANSVERSE FLUX PM GENERATOR FOR SMALL SCALE WIND TURBINE</b> .....         | 3481 |
| <i>R. Nasiri-Zarandi ; A. M. Ajamloo</i>   |      |
| <b>AN IMPROVED CELL TRANSMISSION MODEL OF TRAFFIC CONSIDERING ELECTRIC VEHICLES AND CHARGING STATIONS</b> .....                                | 3487 |
| <i>Hongping Wang ; Yi-ping Fang ; Enrico Zio</i>   |      |
| <b>Author Index</b>  |      |