

2022 AEIT International Annual Conference (AEIT 2022)

**Rome, Italy
3 – 5 October 2022**



**IEEE Catalog Number: CFP2217W-POD
ISBN: 978-1-6654-7441-2**

**Copyright © 2022, Italian Association of Electrotechnics, Electronics, Automation,
Information Technology and Telecommunications (AEIT)
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:	CFP2217W-POD
ISBN (Print-On-Demand):	978-1-6654-7441-2
ISBN (Online):	978-88-87237-55-9

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
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2022 AEIT International Annual Conference (AEIT) October 3-5, 2022 Rome, Italy

TABLE OF CONTENTS

TS01 Resilience of Electrical Systems, Climate Changes and Energy Transition (Special Session)

TS01–01 Frequency regulation for dynamic islanding operations in multi-fuel microgrids...1

Matteo Spiller, Andrea Vicario, Filippo Bovera, Giuliano Rancilio, Aleksandar Dimovski, Marco Merlo (Politecnico di Milano, Italy)

TS01–02 A Statistical Approach to Analyze Possible Correlations Between Space Weather Events and Recorded Failures on the Italian Transmission Grid...7

Francesco Berrilli, Stefano Bifaretti, Vincenzo Bonaiuto (University of Rome Tor Vergata, Italy); Giuseppe Consolini (INAF, Italy); Dario Del Moro (University of Rome Tor Vergata, Italy); Luca Orrù, Luca Santo, Francesco Silletti (Terna, Italy); Angelo Spena, Cristina Terlizzi (University of Rome Tor Vergata, Italy)

TS01–03 A capital light solution to increase power system resilience against wet snow: the Italian experience with anti-torsional devices...13

Emanuele Ciapessoni, Diego Cirio, Andrea Pitto, Giovanni Pirovano (Ricerca sul Sistema Energetico-RSE, Italy); Enrico Maria Carlini, Francesco Marzullo, Silverio Casulli, Federico Falorni, Alessandro Lazzarini, Francesca Scavo (Terna, Italy)

TS01–04 Future projections of wet-snow events and loads on overhead lines...19

Paola Faggian, Arianna Trevisiol, Emanuele Ciapessoni (Ricerca sul Sistema Energetico-RSE, Italy); Francesco Marzullo, Francesca Scavo (Terna, Italy)

TS01–05 The impacts of synthetic correlated generation of weather variables on adequacy analyses...25

Giuseppe Marco Tina, Claudio Francesco Nicolosi (University of Catania, Italy); Domenico Stefanelli (Enel, Italy)

TS01–06 Emergency Generators for Supplying Islanded MV Networks...31

Tommaso Bragatto (Sapienza University of Rome, Italy); Luigi D’Orazio, Alberto Cerretti (e-distribuzione, Italy); Alberto Geri, Fabio Massimo Gatta, Marco Maccioni (Sapienza University of Rome, Italy); Roberto Turri (University of Padua, Italy)

TS01–07 Evaluation of Weather Forecast Uncertainty for HV Grid Operational Resilience Improvement...37

Gabriele Biasiotti, Michele Poli, Simone Talomo, Mirko Romanin, Chiara Vergine (Terna Rete Italia, Italy); Luigi Calcara, Massimo Pompili (Sapienza University of Rome, Italy)

TS02 Flexible Power Systems and DERs

TS02–01 Exploitation of Distributed Energy Resources for local services on power distribution network...41

Luigi Pellegrino, Riccardo Lazzari, Dario Ronzio (Ricerca sul Sistema Energetico-RSE, Italy); Gaetano Iannarelli, Alessandro Cirocco, Andrea Ruffini (Unareti, Italy)

TS02–02 A short-term congestion management algorithm for the Italian subtransmission grid: experimental validation of the OSMOSE Zonal-EMS...47

Luca Orrù, Giuseppe Lisciandrello (Terna, Italy); Guido Coletta (Ricerca sul Sistema Energetico-RSE, Italy); Marco De Ieso, Stefano Gliozzi (IBM, Italy); Mauro Ramacciani, Tiziano D'Aversa (Terna Rete Italia, Italy)

TS02–03 H2020 OSMOSE PROJECT: Final results of the experimentation phase of industrial Demand Response (DR)...53

Francesco Silletti, Luca Orrù, Marco Di Serafino (Terna, Italy); Laura Bolla, Francesco Maso (Terna Rete Italia, Italy)

TS02–04 Design of a flexibility hub within a Net-Zero Energy Factory. The MESH4U demonstrator...59

Pio Lombardi, Bartłomiej Arendarski, Marc Richter, Sandeep Yadav Mattepu (Fraunhofer Institute for Factory Operation and Automation IFF, Germany); Przemyslaw Komarnicki (Wroclaw University of Technology, Poland); Lorenzo Bartolucci, Stefano Cordiner, Vincenzo Mulone (University of Rome Tor Vergata, Italy)

TS02–05 Management strategy of EV fleets charging stations for demand response capabilities: a case study...64

Gaetano Iannarelli, Alessandro Cirocco, Bartolomeo Greco (Unareti, Italy); Cristina Moscatiello (Sapienza University of Rome, Italy); Alessandro Bosisio (Politecnico di Milano, Italy); Chiara Boccaletti (Sapienza University of Rome, Italy)

TS03 Energy Transition and Electricity Market

TS03–01 Analysis of the intraday market: statistical analysis of German single intraday coupling...70

Andrea Alberizzi (University of Pavia, Italy); Alessandro Zani (Ricerca sul Sistema Energetico-RSE, Italy); Paolo Di Barba (University of Pavia, Italy)

TS03–02 Market-driven sizing and siting of generation investment...76

Gioacchino Tricarico, Marta Martucci, Giuseppe Forte, Maria Dicorato (Politecnico di Bari, Italy); Francisco Gonzalez-Longatt (University of South-Eastern Norway, Norway)

TS03–03 Estimating the Value of Lost Load in Italy through outage cost surveys...82

Luca Marchisio, Fabio Genoese, Fabrizio Vedovelli, Francesca Salterini, Stefano Costa (Terna, Italy)

TS03–04 International benchmarking and new proposals on CBA methodology for the Italian transmission grid planning...87

Temistocle Baffa Scirocco, Enrico Maria Carlini, Fabio Ciasca, Alessio Sallati (Terna, Italy); Maria Carmen Falvo, Cristina Moscatiello, Matteo Scanzano (Sapienza University of Rome, Italy)

TS03–05 Cost-Effective Target Capacity Assessment in the Energy Transition and sensitivity analysis on the main inputs...92

Enrico Maria Carlini, Corrado Gadaleta, Francesco Amabile, Michela Migliori, Francesca Ferretti (Terna, Italy)

TS04 Smart Technologies

TS04–01 A Cost-Benefit Analysis of Batteries for Internet-of-Things Applications...98

Alberto Bocca, Yukai Chen, Alberto Macii, Enrico Macii, Massimo Poncino (Politecnico di Torino, Italy)

TS04–02 Blockchain-Based Public Key Authentication of IoT Devices for Electrical Energy Systems...104

Nicolò Cardamone, Vito Dalena, Antonio Mauro, Marina Settembre, Gabriele Vecchia, Antonino Vitaliti (Fondazione Ugo Bordoni, Italy); Giovanna Dondossola, Daniele Bartalesi, Fabrizio Garrone, Roberta Terruggia (Ricerca sul Sistema Energetico-RSE, Italy)

TS04–03 Hybrid Deep Learning Pipeline for Advanced Electrical Wafer Defect Maps Assessment...110

Francesco Rundo, Salvatore Coffa, Michele Calabretta, Riccardo Emanuele Sarpietro, Angelo Messina, Carmelo Pino (STMicroelectronics, Italy); Simone Palazzo, Concetto Spampinato (University of Catania, Italy)

TS04–04 Applications of Capacitance Sensors in IoT-based Structural Health Monitoring Systems...116

Mohamed AbdelRaheem (Assiut University, Egypt); Mahmoud AbdelHafeez Sayed (Assiut University, Egypt and Carleton University, Canada); Amr Nassr (Ajman University, UAE and Assiut University, Egypt)

TS04–05 The Integrated Decision-Making Support for Integrated Supplier Selection and Production Planning Problems with Discounted Prices...121
Sutrisno Sutrisno, Widowati Widowati, Robertus Heri Soelistyo Utomo (Diponegoro University, Indonesia)

TS05 Transmission: Technologies and Systems

TS05–01 Sustainability through SF6 reduction on HV/E-HV cable accessories...127
Paolo Boffi, Andrea Iadanza, Mohamed Mammeri (Prysmian Group, Italy)

TS05–02 Tyrrhenian Link: path towards a decarbonized electrical system...132
Francesco Del Pizzo, Enrico Maria Carlini, Temistocle Baffa Scirocco, Francesco Dicuonzo, Andrea Urbanelli, Antonio Zanghì, Claudio Armillei (Terna, Italy)

TS05–03 Hybrid HVDC LCC-VSC system integration and technological aspects in a multi-terminal DC grid...138
Stefano Barsali (University of Pisa, Italy), Enrico Maria Carlini, Temistocle Baffa Scirocco, Francesco Pisaneschi, Andrea Urbanelli, Luca Belmonte (Terna, Italy)

TS05–04 New way of planning of the national transmission grid within the Italian context...144
Francesco Del Pizzo, Enrico Maria Carlini, Temistocle Baffa Scirocco, Francesco Dicuonzo, Claudio Armillei, Andrea Urbanelli, Antonio Zanghì (Terna, Italy)

TS05–05 A versatile cable insulation for MV, HVAC and HVDC systems: return of experience and current applications of HPTE...150
Davide Pietribiasi, Luigi Colla (Prysmian Group, Italy); Massimo Marzinotto (Terna, Italy); Sergio Chinosi, Alberto Bareggi (Prysmian Group, Italy); Luca Guizzo (Terna, Italy)

TS05–06 HVAC-to-HVDC OHL conversion: a study case in the Sicilian transmission network...155
Lorenzo Carmine Vitulano (Ricerca sul Sistema Energetico-RSE, Italy); Sebastian Dambone Sessa (University of Padua, Italy); Angelo L'Abbate, Roberto Calisti (Ricerca sul Sistema Energetico-RSE, Italy)

TS06 Evolution of power system and smart grid laboratories (Special Session)

TS06–01 Accuracy Analysis of Dual Active Bridge Simulations under Different Integration Methods...161

Gabriele Arena (Karlsruhe Institute of Technology, Germany); Dmitri Vinnikov, Andrii Chub (Tallinn University of Technology, Estonia); Giovanni De Carne (Karlsruhe Institute of Technology, Germany)

TS06–02 Power Hardware In the Loop laboratory testing capability for energy technologies...167

Giovanni De Carne, Dustin Kottonau (Karlsruhe Institute of Technology, Germany)

TS06–03 A Test Bench for a Blockchain-based Management of Smart Prosumers' Flexibility...172

Pierluigi Gallo, Fabio Massaro, Eleonora Riva Sanseverino, Salvatore Ruffino, Giuseppe Sciumé, Antony Vasile, Gaetano Zizzo (University of Palermo, Italy)

TS06–04 Real-Time Power System Laboratories at the University of Genoa...178

Andrea Bonfiglio, Stefano Bracco, Fabio D'Agostino, Federico Delfino, Paola Laiolo, Marco Invernizzi, Stefano Massucco, Renato Procopio, Matteo Saviozzi, Federico Silvestro (University of Genoa, Italy)

TS06–05 Control and Power Hardware-in-the-Loop tests for low-inertia power systems...182

Sergio Bruno, Giovanni Giannoccaro, Muhammad Muzammal Islam, Cosimo Iurlaro, Massimo La Scala, Marco Menga, Carmine Rodio (Politecnico di Bari, Italy)

TS06–06 Ensiel National Energy Transition Real Time Lab: a Novel Tool to Shape the Future Energy System...188

Giorgio Benedetto, Ettore Bompard, Andrea Mazza, Enrico Pons (Politecnico di Torino, Italy); Sergio Bruno, Giovanni Giannoccaro, Massimo La Scala (Politecnico di Bari, Italy); Fabrizio De Caro (University of Sannio), Andrea Bonfiglio, Stefano Bracco, Marco Invernizzi, Mansueto Rossi (University of Genoa, Italy); Antonio De Paola, Dimitrios Thomas, Evangelos Kotsakis, Gianluca Fulli (Joint Research Centre of the European Commission, Italy); Domenico Villacci (University of Naples Federico II, Italy)

TS06–07 Setup for HIL simulations of isolated microgrids at the Gridspertise LV Smart Grid Lab...194

Gianpatrizio Bianco, Lucio Barbato, Gianni Ceneri, Antonio Dell'Angelo, Domenico Demuro, Luigi Mascolo (Gridspertise, Italy); Chiara Micillo (e-distribuzione, Italy); Francesco Renna, Gianluca Sapienza (Gridspertise, Italy)

TS07 Mission Innovation for clean energy transition: technology solutions and experimental demonstrators (Special Session) - I

TS07–01 MISSION Project: Design of MV/LV hybrid AC/DC smart-energy grid...200

Chiara Gandolfi, Riccardo Lazzari, Michele Zanoni, Daniele Palladini (Ricerca sul Sistema Energetico-RSE, Italy)

TS07–02 MISSION Project: use cases definition for a Smart Energy Multi-vectors Microgrid...206

Giovanna Adinolfi, Roberto Ciavarella, Maria Valenti, Giorgio Graditi (ENEA, Italy)

TS07–03 Techno-economic design of a smart multienergy microgrid...210
Salvatore Fabozzi, Giorgio Graditi, Maria Valenti (ENEA, Italy)

TS08 Microgrids and Energy Communities (Special Session)

TS08–01 MESP - An Interoperable Platform for Future Multi-Energy Systems...216
Gabriele Paludetto, Enea Bionda, Francesca Soldan (Ricerca sul Sistema Energetico-RSE, Italy)

TS08–02 Optimal planning and operation of a small size Microgrid within a Positive Energy District...222
Abhinav Sawhney, Stefano Bracco, Federico Delfino, Barbara Bonvini (University of Genoa, Italy)

TS08–03 Self-Consumption and Energy Autarky in Energy Communities - simulation and evaluation of scalable ‘Energy Cells’ in Austria, Belgium and Norway...228
Karthik Subramanya Bhat (University of Applied Sciences Technikum Wien, Austria); Johanna Ganglbauer (4Ward Energy Research, Austria); Manfred Tragner (University of Applied Sciences Technikum Wien, Austria)

TS08–04 Analytical Model for Losses Mitigation in Series Power Electronic Converter...234
Kishore Akkala, Roberto Faranda (Politecnico di Milano, Italy); Pierfrancesco Sodini (Enel Green Power, Italy)

TS08–05 Performance Metrics For Renewable Energy Communities...240
Emilio Ghiani, Riccardo Trevisan, Fabrizio Pilo (University of Cagliari, Italy)

TS08–06 Microgrids Models for the Aggregation of End-Users in Energy Communities...246
Riccardo Loggia, Alessandro Flamini, Andrea Massaccesi, Antonio Capizzi, Cristina Moscatiello, Luigi Martirano (Sapienza University of Rome, Italy)

TS08–07 Methods and Tools for the Management of Renewable Energy Communities: the ComER project...252
Anna Rita Di Fazio, Arturo Losi, Mario Russo (University of Cassino and Southern Lazio, Italy); Filippo Cacace, Francesco Conte, Giulio Iannello (Campus Bio-Medico University of Rome, Italy); Gianluca Natrella, Matteo Saviozzi (University of Genoa, Italy)

TS08–08 Day-ahead Forecast of PV Systems and End-Users in the Contest of Renewable Energy Communities...258
Tommaso Capotosto, Anna Rita Di Fazio, Sara Perna (University of Cassino and Southern Lazio, Italy); Francesco Conte, Giulio Iannello (Campus Bio-Medico University of Rome, Italy); Pasquale De Falco (University of Naples Parthenope, Italy)

TS08–09 Energy community innovations and regional policy diversification in Italy: a preliminary analysis...264

Alessandro Bonifazi (Politecnico di Bari, Italy); Franco Sala (Ricerca sul Sistema Energetico-RSE, Italy); Monica Bolognesi (University of Florence, Italy)

TS09 Mission Innovation for clean energy transition: technology solutions and experimental demonstrators (Special Session) - II

TS09–01 A Smart Thermal Management System for High Efficiency Data Center Cooling in Microgrid Environment...270

Valeria Palomba, Giovanni Brunaccini, Davide Aloisio, Giuseppe Dino (CNR-ITAE, Italy); Massimiliano Luna, Giuseppe La Tona, Maria Carmela Di Piazza (CNR-INM, Italy); Andrea Frazzica, Francesco Sergi (CNR-ITAE, Italy)

TS09–02 Technical and Environmental assessment of diesel lightweight truck retrofitting by hydrogen...276

Giuseppe Napoli, Giovanni Tumminia, Laura Andaloro, Salvatore Micari (CNR-ITAE, Italy); Salvatore Casella (GECO Engineering, Italy); Dino Menichetti (FERCAM, Italy); Vincenzo Antonucci, Marco Ferraro (CNR-ITAE, Italy)

TS09–03 Modeling of bifacial photovoltaic systems including temperature, albedo and perimeter effects: comparison with data...282

Roberto Corso, Marco Leonardi, Andrea Scuto, Stefania M.S. Privitera, Salvatore Lombardo (CNR-IMM, Italy)

TS09–04 Machine learning techniques for data analysis in materials science...287

Claudio Ronchetti, Marco Puccini, Sergio Ferlito, Simone Giusepponi, Filippo Palombi, Francesco Buonocore, Massimo Celino (ENEA, Italy)

TS09–05 The Smart Grids Innovation Accelerator - SGIA: an international open platform to boost smart grids innovation through knowledge sharing...293

Enea Bionda, Francesca Soldan, Mattia Cabiati, Luciano Martini (Ricerca sul Sistema Energetico-RSE, Italy)

TS10 Electrical, Electronics, and Information Communication Technologies for E-Vehicles

TS10–01 Experimental Implementation of a Trajectory Planner for Autonomous Driving...299

Stefano Arrigoni, Matteo Pirovano, Simone Mentasti, Michael Khayyat, Francesco Braghin, Federico Cheli, Matteo Matteucci (Politecnico di Milano, Italy)

TS10–02 Bio-inspired Embedded System for Intelligent Driving Assistance in the Next Generation Cars...305

Francesco Rundo, Riccardo Emanuele Sarpietro (STMicroelectronics, Italy); Sebastiano Battiato (University of Catania, Italy)

TS10–03 A V2I communication framework of adaptive traffic lights and a prototype shuttle...311

Nicolò Maria Mari, Stefano Arrigoni, Francesco Braghin, Simone Mentasti, Mauro Filippini (Politecnico di Milano, Italy)

TS10–04 Detection and mapping of crop weeds and litter for agricultural robots...317

Paolo Cudrano, Simone Mentasti, Emanuele Locatelli, Matteo Nicolò, Samuele Portanti, Alessandro Romito, Sotirios Stavrakopoulos, Gülce Topal, Mirko Usuelli, Matteo Zinzani, Matteo Matteucci (Politecnico di Milano, Italy)

TS10–05 Reducing the Curtailment of Photovoltaic Energy Production through Smart Electric Vehicle Charging...323

Soheil Saadatmandi, Gianfranco Chicco (Politecnico di Torino, Italy); Francesco Giordano, Maurizio Arnone (Links Foundation, Italy)

TS10–06 Robust adaptive integral backstepping control of FC-SC-battery and traction motor based hybrid electric vehicles...329

Muhammad Muzammal Islam, Sergio Bruno, Cosimo Iurlaro, Massimo La Scala (Politecnico di Bari, Italy)

TS11 Smart Devices and Systems for Information and Communication Technologies

TS11–01 Object tracking with low resolution Lidar and Radar fusion, a comparison...335

Pragyan Dahal, Simone Mentasti, Hafeez Husain Cholakkal, Stefano Arrigoni, Francesco Braghin, Matteo Matteucci, Federico Cheli (Politecnico di Milano, Italy)

TS11–02 Design and Simulation-based Testing of a 5G-Connected Curve Speed Warning System...341

Michael Khayyat, Andrea Leo, Stefano Arrigoni, Alberto Gabriele, Francesca Mancini, Francesco Braghin (Politecnico di Milano, Italy)

TS11–03 Extension of the FTT-Ethernet Architecture for the support of Telemetry Messages in Launcher Networks...347

Vincenzo Eramo, Francesco Valente, Francesco Giacinto Lavacca, Tiziana Fiori, Valentino Papandrea (Sapienza University of Rome, Italy); Marta Albano, Simone Ciabuschi, Enrico Cavallini (Agenzia Spaziale Italiana, Italy)

TS11–04 GNS-3 Emulation Platform to Study Wide Area Network Performance in Contexts Close to Reality...353

Edion Tego (Fondazione Ugo Bordoni, Italy); Vincenzo Attanasio (Istituto Superiore delle Telecomunicazioni e delle Tecnologie dell'Informazione, Italy); Francesco Matera (Fondazione Ugo Bordoni, Italy)

TS11–05 Maximizing performance and power density in PFC by using SMD packages with top-side cooling...359

Marco Papaserio, Domenico Nardo, Daniela Cavallaro, Cristiano Gianluca Stella, Stefano Orlando, Ludovica Longo, Giuseppe Sorrentino (STMicroelectronics, Italy)

TS12 Power Electronics

TS12–01 Impedance-based Stability Analysis of Cascaded Dual-Active-Bridge Converters in Smart Transformer Microgrids...365

Jiajun Yang, Sandro Guenter, Giampaolo Buticchi (University of Nottingham Ningbo China, China)

TS12–02 A Buck LED Driver with a Novel Average Current Mode Control...370

Claudio Adragna, Giovanni Gritti (STMicroelectronics, Italy)

TS12–03 Voltage balancing algorithm of a MMC-like topology for pulsed power applications...376

Cristina Terlizzi, Daniele Berardi (University of Rome Tor Vergata, Italy); Francesco Santoro (Consorzio RFX and University of Padua, Italy); Antonio Magnanimo, Markus Teschke (Max-Planck-Institute for Plasma Physics, Germany); Stefano Bifaretti (University of Rome Tor Vergata, Italy)

TS12–04 New MOSFET Technology Lowers Noise in 12V Automotive Systems...382

Giusy Gambino, Carmelo Mistretta, Giuseppe Longo, Filippo Scrimizzi (STMicroelectronics, Italy)

TS12–05 GaN-Based Low-Voltage Inverter for Electric Scooter Drive System...388

Salvatore Musumeci, Vincenzo Barba (Politecnico di Torino, Italy); Marco Palma (EPC Europa, Italy)

TS13 e-mobility & shipboard applications (Special Session)

TS13–01 Flexible measurement system for monitoring and event recording in substations of 3 kV DC electric traction systems...394

Daniele Difino, Marco Camomilla, Eugenio Fedeli (Rete Ferroviaria Italiana, Italy)

TS13–02 Technical and economic analysis of EV high-power recharging pools equipped with storage...400

Massimo Ceraolo (University of Pisa, Italy); Filippo Colzi (Ricerca sul Sistema Energetico-RSE, Italy); Giovanni Lutzemberger (University of Pisa, Italy); Giuseppe Mauri (Ricerca sul Sistema Energetico-RSE, Italy); Sara Salamone (University of Pisa, Italy)

TS13–03 A comparison of two different architectures for 1 kV AC railway signaling power supply...406

Regina Lamedica, Alessandro Ruvio, Davide Gatto (Sapienza University of Rome, Italy); Massimo Castellani, Francesco Piazza (Italferr, Italy); Federico Carere (Sapienza University of Rome, Italy)

TS13–04 Calibration and Validation of Equivalent Circuit and Physics-Based Models for Li-ion Battery...412

Marco Lagnoni, Claudio Scarpelli, Federica Barontini, Antonio Bertei, Giovanni Lutzemberger, Monica Puccini (University of Pisa, Italy)

TS13–05 Feasibility Study of Use of Electric Vehicle In a Small Town Of Spain...418

Andrea Di Martino, Michela Longo (Politecnico di Milano, Italy); Linda Barelli (University of Perugia, Italy); Andrés Montero Romero (Universidad Carlos III de Madrid, Spain); Dario Zaninelli (Politecnico di Milano, Italy)

TS13–06 Energy Consumption Calculating in Electric Vehicles Considering Road Gradient...424

Alessandro Saldarini, Matteo Pizzuto, Michela Longo (Politecnico di Milano, Italy); Marco Pasetti (University of Brescia, Italy); Morris Brenna (Politecnico di Milano, Italy)

TS14 Power System Analysis and Simulation

TS14–01 EHV/HV Italian Network Three-Phase Power-Flow by PFPD...430

Roberto Benato, Giovanni Gardan, Luca Rusalen (University of Padua, Italy); Giorgio Maria Giannuzzi, Cosimo Pisani (Terna, Italy)

TS14–02 Grid-Following and Grid-Forming MODELS in ATP-EMTP for Power Systems Simulation...436

Rossano Musca, Gaetano Zizzo (University of Palermo, Italy); Alessandro Manunza (M2EC, Italy)

TS14–03 The Role of Digital Twins in Power System Inertia Estimation...442

Fabrizio De Caro, Viktoriya Mostova, Alfredo Vaccaro (University of Sannio, Italy)

TS14–04 Equation-based Modeling of Synchronous Machines for Transient Stability Studies...448

Mohammad Babaeifar, Stefano Barsali, Massimo Ceraolo (University of Pisa, Italy)

TS14–05 The Ossanna's Theorem for the Analytical Determination of a Two-Bus System PV Curve and Voltage Collapse Point...454

Giovanni Gardan, Roberto Benato (University of Padua, Italy)

TS14–06 Transformer Resonant Phenomenon during Power System Restoration Planning...460

Roberto Benato, Sebastian Dambone Sessa (University of Padua, Italy); Giorgio Maria Giannuzzi, Cosimo Pisani, Michele Poli (Terna, Italy); Francesco Sanniti (University of Padua, Italy)

TS15 Monitoring and Power Quality

TS15–01 An Edge-based Architecture for Phasor Measurements in Smart Grids...464

Stefano Galantino, Fulvio Rizzo (Politecnico di Torino, Italy); Andrea Cazzaniga, Fabrizio Garrone, Roberta Terruggia, Riccardo Lazzari (Ricerca sul Sistema Energetico-RSE, Italy)

TS15–02 Overview of the Propagation of Supraharmonics in Power Systems...470

Alberto Prudenzi, Andrea Fioravanti, Andrea Silvestri, Fabrizio Ciancetta, Edoardo Fiorucci, Simone Mari (University of L'Aquila, Italy)

TS15–03 Highlighting of local Power Quality states with the new QuEEN system, enhanced with Deep Learning and Machine Learning algorithms...476

Michele Zanoni, Riccardo Chiumeo, Liliana Tenti, Massimo Volta (Ricerca sul Sistema Energetico-RSE, Italy)

TS15–04 SDN implementation based on Mininet to support Synchrophasor Measurement Systems for Smart Grid Management...482

Francesco D'Alterio (Fondazione Ugo Bordoni, Italy); Francesco Giacinto Lavacca (Sapienza University of Rome, Italy); Samuela Persia (Fondazione Ugo Bordoni, Italy); Andrea Cazzaniga, Fabrizio Garrone, Carlo Tornelli (Ricerca sul Sistema Energetico-RSE, Italy)

TS15–05 Assessing a Health Index Algorithm for High Voltage Overhead Power Lines...488

Antonio Di Pasquale, Mario Pagano, Carlo Petrarca, Francesco Volpe (University of Naples Federico II, Italy)

TS15–06 A GIS-based approach to assessing large-scale building-integrated photovoltaic generation: a case study of Milan, Italy...494

Alessandro Bosisio, Alberto Berizzi (Politecnico di Milano, Italy); Andrea Morotti (Unareti, Italy); Gaetano Iannarelli (Sapienza University of Rome, Italy); Bartolomeo Greco (Unareti, Italy); Chiara Boccaletti (Sapienza University of Rome, Italy)

TS16 Electrical Risk, Safety and Stability Improvement

TS16–01 Fire Hazard of Electric Vehicles in Enclosed Structures...500

Armando La Scala, Maria Francesca Sabbà, Dora Foti (Politecnico di Bari, Italy)

TS16–02 Analysis of Lightning Transients in 2×25 kV 50 Hz Railway Traction System using EMTP...506

Amedeo Andreotti, Antonio Di Pasquale, Mario Pagano, Nagananthini Ravichandran, Francesco Volpe (University of Naples Federico II, Italy)

TS16–03 First results on an application of Iliceto Shield Wire Scheme to pilot project in Tanzania...512

Romano Alberto Aciri, Matteo Agnolet, Maria Carmen Falvo (Sapienza University of Rome, Italy); Antonio Iliceto (Association "Francesco Iliceto" for international capacity building in Power Systems Development, Italy); Santos Kihwele, Heavenlight Munisi (University of Dar Es Salaam, Tanzania); Alessandro Pastorino, Federico Santi (Sapienza University of Rome, Italy)

TS16–04 Transmission capacity and static stability improvement by series compensation: case study on South-North corridor of Italy...517

Enrico Maria Carlini, Corrado Gadaleta, Michela Migliori, Davide Monno, Francesca Ferretti, Gianfranco Luongo, Silvia Moroni (Terna, Italy)

TS17 Power System Operation and RES Integration

TS17–01 Grid Frequency Control: Interaction between Fast Regulations...523

Marco Raffaele Rapizza, Silvia Maria Canevese, Diego Cirio (Ricerca sul Sistema Energetico-RSE, Italy)

TS17–02 Project Osmose: overview and results of voltage regulation tests from wind power plants...529

Alessio Siviero, Marco Di Serafino, Luca Orrù (Terna, Italy); Tiziano D'Aversa, Laura Bolla (Terna Rete Italia, Italy); Giacomo Petretto, Massimo Mannelli (Enel Global Power Generation, Italy); Alessandro Arienti, Pasquale Morelli (Edison, Italy);

TS17–03 The new 36 kV standard voltage level to increase RES penetration in sub-transmission network...535

Enrico Maria Carlini, Corrado Gadaleta, Alfonso De Cesare, Michela Migliori, Chiara Giordano, Silvia Moroni (Terna, Italy)

TS17–04 Synchronous condensers with flywheel for power systems with high penetration of RES: the case of Italian transmission grid...541

Marzia Caldora, Luca Cantoni, Maria Carmen Falvo (Sapienza University of Rome, Italy); Alessandro Coretti, Andrea Lazzarin, Chiara Vergine, Adriano Cinque, Benedetto Aluisio (Terna, Italy)

TS17–05 Integration of Wind Offshore Generation into the Italian Transmission Network: connection solutions and case study...546

Enrico Maria Carlini, Corrado Gadaleta, Michela Migliori, Antonio Conserva, Davide Monno, Silvia Moroni (Terna, Italy)