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Technical Programme

Wednesday, September 18, 2019

8,30 Registration

10,00 ■ 10,30 Welcome Statements

Debora Stefani ■ *Presidente Generale AEIT*

Luigi Dei ■ *Rettore Università di Firenze*

Eugenio Giani ■ *Presidente del Consiglio Regionale della Toscana*

Cecilia Del Re ■ *Assessora all'innovazione tecnologica Comune di Firenze*

Giampiero Giovannetti ■ *Segretario Nazionale CNPI*

Pietro Antonio Scarpino ■ *Presidente AEIT Sezione Toscana e Umbria*

Carlo Cecati ■ *Presidente Comitato Scientifico AEIT 2019*

10,30 ■ 13,00 Opening Plenary Session

Chair: Carlo Cecati ■ *2019 AEIT Technical Program General Chair*

■ **The Future is distributed - The key role of DSOs to enable the Energy Transition** ■ Vincenzo Ranieri - *E-Distribuzione, Chief Executive Officer*

■ **Energy transition and decarbonization: challenges and opportunities for the Italian system** ■ Luigi Michi - *Terna, Head of Strategy, Development and System Operation*

■ **Innovation & regulation: a key link towards energy transition** ■ Maurizio Delfanti - *RSE, Chief Executive Officer*

■ **Digitalisation and Sustainability: pillars of a new deal for industry** ■ Filomena D'Arcangelo - *ANIE, Technical and Environment Director*

■ **From pure cable manufacturer to data provider and cable system integrator** ■ Roberto Candela - *Prysmian Electronics, Chief Executive Officer*

■ **The new era of PV industry** ■ Diego Percopo - *EF Solare Italia, Chief Executive Officer*

■ **Energy trends: need for new products and new competencies** ■ Paolo Perani - *ABB, Strategic Business Development Manager*

■ **Technological Innovation in Railway Infrastructures: RFI experience** ■ Eugenio Fedeli - *RFI, R&D Director*

■ **Electric mobility: how to turn a potential threat to a great opportunity for power systems** ■ Bruno Cova - *CESI, System Planning Director*

13,00 ■ 14,00 Lunch

14,00 ■ 14,30 Commemoration of Prof. Francesco Gagliardi, Former AEIT General President

14,30 ■ 15,00 AEIT Young Members Group and Social ■ Nicolò Ventani - *Presidente Gruppo Giovani AEIT Sezione Toscana e Umbria*

15,00 ■ 15,30 AEIT for STEM

Rosa Anna Mastromauro - *Università di Firenze, Italy*

15,30 ■ 16,15 Keynote Speech 1

■ **Multilevel topologies for drives and grid tied applications, with reduced DC link supplies** ■ Kumarkutti Gopakumar - *FIEEE, FNAE - Indian Institute of Science Bangalore, India*

16,15 ■ 16,30 Break

16,30 ■ 18,30 ROOM A ■ Technical Session A1

Distributed Generation, Storage and Distribution Networks

Chair: Dario Zaninelli ■ *Politecnico di Milano, Italy*

A1.1 ■ Aggregation of residential Energy Storage Systems ■ Luigi Pellegrino, Carlo Sandroni - *Ricerca sul Sistema Energetico - RSE, Italy*

A1.2 ■ Techno-Economic Control of Energy Storage System for Demand Side Management ■ Francesco Grasso - *University of Florence, Italy*; Mostafa Abdollahi - *Technical University of Catalonia, Spain*; Libero Paolucci, Giacomo Talluri - *University of Florence, Italy*

A1.3 ■ Techno-Economic Evaluation of On-Grid Battery Energy Storage System in Jordan using Homer Pro ■ Hussam J. Khasawneh - *The University of Jordan, Jordan*; Motasem Bani Mustafa - *Ulster University, United Kingdom*; Ahmed Said Al-Salaymeh, Motasem Saidan - *The University of Jordan, Jordan*

A1.4 ■ A three-phase Optimal Power Flow formulation for a Low Voltage electric grid: a study case ■ Monica Crosa di Vergagni, Stefano Massucco, Federico Silvestro - *University of Genova, Italy*

A1.5 ■ On the Use of Synchronized LoRaWAN for the Coordination of Distributed Energy Resources in Smart Grids ■ Marco Pasetti, Stefano Rinaldi, Emiliano Sisinni, Paolo Ferrari, Alessandra Flammini - *University of Brescia, Italy*; Enrico Ragaini - *ABB, Italy*; Michela Longo, Dario Zaninelli - *Politecnico di Milano, Italy*

A1.6 ■ Multi-Layer RNN-based Short-term Photovoltaic Power Forecasting using IoT Dataset ■ Neungsoo Park, Hyung Keun Ahn - *Konkuk University, Korea*

A1.7 ■ Information Inconsistencies in Smart Distribution Grids under Different Failure Causes modelled by Stochastic Activity Networks ■ Romina Muka, Fredrik B. Haugli - *Norwegian University of Science and Technology, Norway*; Hanne Vefsnmo - *SINTEF Energy Research, Norway*; Poul E. Heegaard - *Norwegian University of Science and Technology, Norway*

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16,30 ■ 18,30 ROOM B ■ Technical Session B1

Recent Advances in Coding Theory and its Applications

Chair: Massimo Battaglioni ■ *Università Politecnica delle Marche, Italy*

B1.1 ■ Obtaining structured generator matrices for QC-LDPC codes ■ Massimo Battaglioni, Paolo Santini, Marco Baldi, Giovanni Cancellieri - *Università Politecnica delle Marche, Italy*

B1.2 ■ Coding Bounds in the Finite-Block-Length Regime: an Application to Spread-Spectrum Systems Design ■ Tomaso Erseghe, Nicola Laurenti, Matteo Zecchin - *University of Padova, Italy*

B1.3 ■ Symbol Message Passing Decoding of Nonbinary Spatially-Coupled Low-Density Parity-Check Codes ■ Emna Ben Yacoub - *Technical University of Munich, Germany*; Francisco Lázaro - *German Aerospace Center - DLR, Germany*; Alexandre Graell i Amat - *Chalmers University of Technology, Sweden*; Gianluigi Liva - *German Aerospace Center - DLR, Germany*

B1.4 ■ Performance Study of a Class of irregular LDPC Codes through low Complexity Bounds on their Belief-Propagation Decoding Thresholds ■ Francesca Vatta, Alessandro Soranzo, Massimiliano Comisso, Giulia Buttazzoni, Fulvio Babich - *University of Trieste, Italy*

B1.5 ■ A Note on Channel Polarization and Mutual Information Transformation Charts of Polar Codes ■ Marco Chiani, Enrico Paolini - *University of Bologna, Italy*

B1.6 ■ A Simplified Application of Ordered Statistics Decoding to Single Parity Check Product Codes ■ Roberto Garelo, Giacomo Verardo - *Politecnico di Torino, Italy*

B1.7 ■ Using Non-Binary LDPC and MDPC Codes in the McEliece Cryptosystem ■ Marco Baldi, Giovanni Cancellieri, Franco Chiaraluce - *Università Politecnica delle Marche, Italy*; Edoardo Persichetti - *Florida Atlantic University, USA*; Paolo Santini - *Università Politecnica delle Marche, Italy*

16,30 ■ 18,30 ROOM C ■ Technical Session C1

Power Converters and Motor Drives

Chairs: Luigi Di Noia ■ *University of Naples Federico II, Italy* and Rosa Anna Mastromauro ■ *Università di Firenze, Italy*

C1.1 ■ Development of Faults Diagnostic method for Automotive Motor Drives ■ Byong Jo Hyon, Dongmyoung Joo, Joon Sung Park - *Korea Electronics Technology Institute, Korea*

C1.2 ■ Modeling, control and simulation of a light electric vehicle propulsion system based on EMR ■ Sorina Maria Ciornei, Mircea Ruba, Raul Octavian Nemes - *Technical University of Cluj-Napoca, Romania*; Calin Husar - *Siemens, Romania*; Claudia Martis - *Technical University of Cluj-Napoca, Romania*

C1.3 ■ Power Quality Improvement for Chopper-Cell Based Modular Multilevel Converters ■ Ahmed Majed Saif, Concettina Buccella, Maria Gabriella Cimoroni, Carlo Cecati - *University of L'Aquila, Italy*

C1.4 ■ Design and Analysis of Outer Rotor Permanent Magnet Assisted Synchronous Reluctance Machine with Concentrated Winding for Small Electric Propulsion ■ Razvan Alexandru Inte, Florin Nicolae Jurca, Claudia Martis - *Technical University of Cluj-Napoca, Romania*

C1.5 ■ Combination Super-Twisting Sliding Mode with Finite Control Set Predictive Torque Control for IM Drives ■ Diego Dias Pinheiro, Fabiano Camargo Rosa, Edson Bim - *University of Campinas, Brazil*

C1.6 ■ Robust Load-Torque Estimation for DC Motor without Torque Sensor ■ Stefano Fabbri, Matthias Nienhaus, Emanuele Grasso - *Saarland University, Germany*

C1.7 ■ Sub-Synchronous Torsional Interactions and Start-Up Issues in Oil&Gas Plants: a Real Case Study ■ Lorenzo Bongini, Rosa Anna Mastromauro - *University of Florence, Italy*

C1.8 ■ Theoretical and Experimental modeling and Speed control of a Cereal Milling System ■ Moustapha Diop, Boubacar Niang - *Cheikh Anta Diop University, Senegal*; Mouhamadou Thiam - *Polytechnic School of Ties, Senegal*; Lamine Thiaw - *Cheikh Anta Diop University, Senegal*, Sileymane Dianka - *University of Rome Tor Vergata, Italy*

C1.9 ■ Investigation on Cascode Devices for High Frequency Electrical Drives Applications ■ Vincenzo Castiglia, Antonino Oscar Di Tommaso, Rosario Miceli, Filippo Pellitteri, Giorgio Vasallo - *University of Palermo, Italy*



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09,00 ■ 10,45 ROOM A ■ Technical Session A2

Power Systems: Networks and Interconnection

Chair: Roberto Caldon ■ *AEIT and Università di Padova, Italy*

A2.1 ■ Initiatives of Regional Cooperation for Italy's power system integration ■ Silvio D'Alberto, Rosario Iannone, Antonio Pascucci, Gianluca Bruno, Silvia Moroni, Enrico Maria Carlini - *Terna Rete Italia, Italy*

A2.2 ■ HVDC link between Italy and Montenegro: impact of the commissioning on the real-time operation ■ Gaetano Pecoraro, Matteo Contu, Flavio Allella, Antonio Pascucci, Marco Cortese, Gianluca Bruno, Enrico Maria Carlini, Roberto Gnudi, Luigi Michi - *Terna, Italy*

A2.3 ■ The DC power planning for network flexibility in the multi-area power system ■ Luigi Michi, Giacomo Donnini, Benedetto Aluisio, Michela Migliori, Chiara Vergine - *Terna, Italy*; Maria Dicorato - *Politecnico di Bari, Italy*; Giuseppe Forte

A2.4 ■ A new real-time approach for the load forecasting in the operation of sub-transmission systems ■ Carmelo Mosca, Enrico Marin, Tao Huang, Ettore Bompard - *Politecnico di Torino, Italy*; Paolo Cuccia, Laura Campisano, Stefano Neri - *Terna Rete Italia, Italy*

A2.5 ■ On Eigenvalues of the Three-Phase Nodal Admittance Matrix ■ Giovanni Mercurio Casolino, Arturo Losi - *University of Cassino and Lazio Meridionale, Italy*

A2.6 ■ IEC 61850-based smart automation system logic to improve reliability indices in distribution networks ■ Alessandro Bosisio, Alberto Berizzi - *Politecnico di Milano, Italy*; Andrea Morrotti, Andrea Pegoiani, Bartolomeo Greco, Gaetano Iannarelli - *UNARETI, Italy*

A2.7 ■ Automatic recognition system of power quality disturbances detection and classification based on MVN neural estimator ■ Francesco Grasso, Libero Paolucci, Giacomo Talluri, Tommaso Bacci, Pietro Antonio Scarpino - *University of Florence, Italy*

09,00 ■ 10,45 ROOM B ■ Technical Session B2

IoT Industrial Applications and cloud resource management

Chair: Giovanni Cancellieri ■ *AEIT and Università Politecnica delle Marche, Italy*

B2.1 ■ Cloud resource management in infrastructure as a service cloud by using workload prediction: a framework based on fuzzy inference engine ■ Nafiseh Razavi, Ali Rezaee, Sahar Adabi - *Islamic Azad University, Iran*

B2.2 ■ IIoT-based Motion Control Efficiency in Automated Warehouses ■ Francesco Benzi, Ezio Bassi - *University of Pavia, Italy*; Filippo Marabelli, Nelson Belloni, Marco Lombardi - *Lenze Italia, Italy*

B2.3 ■ Multiband Multi-rate Narrowband Software Defined Radio waveform based on CPM ■ Azka Zaheer, Muhammad Zee-shan - *National University of Sciences and Technology, Pakistan*
Invited ■ Smart Urban Infrastructure for a concrete and integrated approach to Smart Cities ■ Vincenzo Cortese - *Sirti, Italy*
Invited ■ Internet of Goods: a new paradigm for logistic and transport ■ Veronica Tinucci - *Leghorngroup, Italy*

09,00 ■ 10,45 ROOM C ■ Technical Session C2

Power Electronics & Active and Passive Components

Chairs: Giuseppe Gattavari ■ *AEIT-AMES, Italy* and Salvatore Musumeci - *Politecnico di Torino, Italy*

C2.1 ■ Power Control and Energy Management of Grid-Scale Energy Storage Systems for Smart Users ■ Francesco Grasso - *University of Florence, Italy*; Mostafa Abdollahi - *Technical University of Catalonia, Spain*; Libero Paolucci, Giacomo Talluri - *University of Florence, Italy*

C2.2 ■ IGBT based Three Channel Interleaved PFC Boost Converter for Inverter Front-End Application ■ Salvatore Musumeci, Radu Bojoi, Stefano Borlo, Eric Armando - *Politecnico di Torino, Italy*

C2.3 - The key role of the SJ MOSFET with fast diode in high-end SMPS converters for telecom applications ■ Domenico Nardo, Alfio Scuto, Giuseppe Sorrentino - *STMicroelectronics, Italy*; Angelo Raciti, Santi Agatino Rizzo - *University of Catania, Italy*

C2.4 ■ Development of Active Gate Driver to Reduce Switching Loss for High Power Inverter ■ Jun-Hyuk Choi, Yong-Su Noh, Jin-Hong Kim - *Korea Electronics Technology Institute, Korea*

C2.5 - Effects of parasitic phenomena in half bridge with Super Junction MOSFETs suitable for UAV ■ Luigi Abbatelli - *STMicroelectronics, Italy*; Angelo Raciti - *University of Catania, Italy*; Rosario Scollo - *STMicroelectronics, Italy*; Giuseppe Mauromicale, Santi Agatino Rizzo - *University of Catania, Italy*; Alfio Scuto, Domenico Nardo - *STMicroelectronics, Italy*; Nunzio Salerno, Giovanni Susinni - *University of Catania, Italy*

C2.6 ■ A real-time MCU-based wireless system for PV applications ■ Antonino Laudani, Gabriele Maria Lozito, Martina Radicioni - *Roma Tre University, Italy*

C2.7 ■ Weight Estimation of the Wiring in a Distributed Propulsion System for Aircraft ■ Adolfo Dannier, Andrea Del Pizzo, Luigi Pio Di Noia, Santolo Meo - *University of Napoli Federico II, Italy*

10,45 ■ 11,00 Break

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11,00 ■ 11,45

Keynote Speech 2

Operation of hybrid AC/DC power systems ■ Dirk Van Hertem
■ *University of Leuven, Belgium*

11,45 ■ 13,15 **ROOM A ■ Technical Session A3**

Power System: Protection and Stability

Chair: Stefano Massucco ■ *AEIT-AEE and Università di Genova, Italy*

A3.1 ■ Line Ultra High Speed Protection. Principles and field experience ■ Andrea Di Tomasso, Giuliana Invernizzi, Giorgio Vielmini - *Schweitzer Engineering Laboratories, Italy*

A3.2 ■ A Robust Travelling-Wave Simultaneous Faults Location Considering Parameters Variations ■ Hossam A. Abd el-Ghany, Ahmed M. Azmy, Ahmed Magdy Abeid - *Tanta University, Egypt*

A3.3 ■ A Comprehensive Differential Protection Scheme for Delta Hexagonal Phase Angle Regulating Transformers ■ Ismail A. Soliman, Hossam A. Abd el-Ghany, Ahmed M. Azmy - *Tanta University, Egypt*

A3.4 ■ High Resistance Faults in EHV/HV grids: EF protections and detection logics ■ Fabio Bassi, Leandro Cacioli, Giorgio Maria Giannuzzi - *Terna Rete Italia, Italy*; Alberto Giorgi, Niccolò Nesi - *University of Florence, Italy*; Luciano Vignolini - *Terna Rete Italia, Italy*

A3.5 ■ Voltage Dips in Power Quality - a Brief Review ■ Mircea Buzdugan - *Technical University of Cluj-Napoca, Romania*

A3.6 ■ Robust Fuzzy Power System Stabilizer ■ Sultan Saleh Alwahaibi - *QU, Saudi Arabia*

A3.7 ■ Improving dynamic stability in presence of static generation: issues and potential countermeasures ■ Luigi Michi, Enrico Maria Carlini, Giorgio Giannuzzi, Roberto Zaottini, Cosimo Pisani - *Terna, Italy*

A3.8 ■ Improving dynamic stability with HVDC systems: Italy-Montenegro interconnector case ■ Luigi Michi, Enrico Maria Carlini, Giorgio Giannuzzi, Roberto Zaottini, Cosimo Pisani, Roberto Puddu - *Terna Rete Italia, Italy*

11,45 ■ 13,15 **ROOM B ■ Technical Session B3**

Access Radio Technology and Software Control System

Chair: Andrea Penza ■ *AEIT-AICT, Italy*

B3.1 ■ Analog ICs for Automotive under EMI Attack ■ Anna Ricchelli, Luigi Colalongo, Zsolt Kovacs-Vajna - *University of Brescia, Italy*

B3.2 ■ Weighted Local Access Point based on Fine Matching k-Nearest Neighbor Algorithm for Indoor Positioning System ■ Mohd Amiruddin Abd Rahman, Muhammad Khalis Abdul Karim, Caceja Elyca Anak Bundak - *Universiti Putra Malaysia, Malaysia*

B3.3 ■ Assisting Italian DVB-T users against LTE Signal Impairments: The "HELP Interferenze" Project ■ Massimo Celidonio, Ermanno Fionda, Federica Mangiatordi, Sergio Pompei - *Fondazione Ugo Bordonì, Italy*

B3.4 ■ Coexistence of DVB Television and 5G Services in Adjacent Bands ■ Claudia Carciofi, Andrea Garzia, Ferdinando Lucidi, Andrea Neri - *Fondazione Ugo Bordonini, Italy*

B3.5 ■ Data dissemination to vehicles using 5G and VLC for Smart Cities ■ Francesca Nizzi, Tommaso Pecorella, Stefano Caputo, Lorenzo Mucchi, Romano Fantacci - *University of Florence, Italy*; Mattia Bastianini, Carlo Cerboni, Alessandra Buzzigoli - *Estra, Italy*; Andrea Fratini - *OpenFiber, Italy*; Tassadaq Nawaz, Jacopo Catani - *National Research Council Institute of Optics, Italy*; Marco Seminara - *University of Florence, Italy*

Invited ■ Electromagnetic Field levels and related issues for 5G radio technology ■ Francesco Pugliese - *PuglieseProgettazioni, Italy*

11,45 ■ 13,15 ROOM C ■ Technical Session C3

Innovative smart components, modules and appliances for a truly connected, efficient and secure smart grid

Chair: Maria Dicorato ■ *Politecnico di Bari, Italy*

C3.1 ■ Regaining Insight and Control on SMGW-based Secure Communication in Smart Grids ■ Jens Hiller, Karsten Komanns, Markus Dahlmanns, Klaus Wehrle - *RWTH Aachen University, Germany*

C3.2 ■ Reduction of Output Capacitance for DAB DC-DC Converters in DC Microgrids by Shaping the Resistive Output Impedance ■ Guangyuan Liu, Paolo Mattavelli, Simone Pistollato, Andrea Petucco - *University of Padova, Italy*

C3.3 ■ Operation schedule of DC microgrid for EVs with reserve under various conditions ■ Maria Dicorato, Michele Antonio Trovato - *Politecnico di Bari, Italy*; Giuseppe Forte - *Italy*

C3.4 ■ Triple-Phase Shift Modulation for Dual Active Bridge based on Simplified Switching Loss Model ■ Simone Pistollato, Tommaso Caldognetto, Paolo Mattavelli, Paolo Magnone - *University of Padova, Italy*

C3.5 ■ Simulation Results from a Kinetic-Electrochemical Energy Storage Model for Network Frequency Regulation ■ Sebastian Dambone Sessa, Mauro Andriollo, Andrea Tortella, Roberto Benato - *University of Padova, Italy*

C3.6 ■ Protection and stabilization of Cogeneration plant by means of Rotary UPS with flywheel ■ Lanfranco Pedrotti - *Piller Italia, Italy*; Bud Leavell, Riccardo Ghezzi - *Piller USA, USA*

13,15 ■ 14,15 Lunch

14,15 ■ 17,45 Young and Student Contest Poster Session & First AEIT Young Members Meeting

15,30 ■ 15,45 Young Award Ceremony

15,45 ■ 16,00 Break

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16,00 ■ 18,15 Case Histories

Chairs: Pietro Antonio Scarpino and Francesco Grasso - AEIT Sezione Toscana e Umbria

The DSO 4.0 Project - Innovative solutions of E-Distribuzione ■ Juan Ortiz Noval - *E-Distribuzione, Head of Network Development*

Critical grid situations storyline ■ Enrico Maria Carlini - Terna Rete Italia, *Head of Dispatching and Operation*

Higher Achievements in HV/EHV Cable Fire Performances ■ Stefano Cotugno - *Prysmian, HV BU System Engineering Manager*; Filippo Gabelli - *Prysmian, HV BU System Engineering*

The emergent cybersecurity threats to Industrial Control Systems ■ Claudia Piccolo - *IMQ B.U. Management Systems, ICT Security Dept, Manager*; Alessandro Solano - *IMQ, B.U. Management Systems, ICT Security Dept, Auditor*

EF Solare: the leading operator in Italian PV industry ■ Giuseppe Noviello - *EF Solare Italia, Vice President*

Electrical Safety in Ungrounded Systems: Technologies and Application Cases ■ Danilo Martinucci - *Bender Italia, Business Development Manager*

Technological development and policy scenarios for energy transition, some remarks on ongoing research ■ Romano Ambrogi - *RSE, Strategy and Communication Officer*

Smart Lab laboratory in Dalmine: evolution and continuous improvements ■ Paolo Perani - *ABB, Strategic Business Development Manager*

5G Pilot Project for «Smart Diagnostic» of Railway Infrastructure ■ Mirko Ermini - *RFI, R&D Senior Engineer*

Solution to the grid problems by means of flywheel Rotary UPS ■ Lanfranco Pedrotti - *Piller Italia, Managing Director*

18,15 ■ 19,15 Start Up Plenary Session

Chair: Giulia Nerozzi - AEIT Sezione Toscana e Umbria

River Cleaner Project ■ Lorenzo Lubrano - *Blue Eco Line, CEO*, Camilla Cantiani - *Blue Eco Line, Information & Technology Manager*, Michael Mugnai - *Blue Eco Line, Automation & Control Manager*, Alberto Luckenbach - *Blue Eco Line, Rapid Prototyping Manager*

G-move: manage your space in a smart way ■ Marco Musumeci - *G-Move, CEO*

Technical Cross skills - from the Concept to the Industry ■ Federico Trippi - *R&D Telecommunication and Energy, CEO*

Digitalization and Key enabling technologies: Open Innovation and the challenges of Advising 4.0 ■ Eugenio Telleschi - *Euro Inn Advisory (EIA), Innovation Advisor®*

Italian Minigrid Solutions for Rural Development ■ Alice Nencini - *WindKinetic Off-grid Power System, Operations Manager*

20,30 Conference Dinner

09,00 ■ 11,00 ROOM A ■ Technical Session A4

Management, Operation and Control in Power Systems

Chair: Francesco Grasso - *University of Florence, Italy*

A4.1 ■ Real time operators training: Terna experience in implementing the Commission Regulation (EU) 2017/1485 ■ Claudio Coluzzi, Stefano Orlandi, Silvia Moroni, Matteo Contu, Flavio Allella, Gaetano Pecoraro, Antonio Pascucci, Enrico Maria Carlini - *Terna Rete Italia, Italy*

A4.2 ■ The European Electricity Balancing Platforms and the Imbalance Netting Process: Terna's participation in the International Grid Control Cooperation ■ Matteo Contu, Stefano Montone, Gaetano Pecoraro, Flavio Allella, Antonio Pascucci, Enrico Maria Carlini, Luigi Michi - *Terna, Italy*

A4.3 ■ Integration of synchronous compensator in Terna's remote control and remote operation system ■ Enrico Maria Carlini, Aniello Borriello, Stefano Neri, Luca Barison, Alessandro Marietti, Laura Campisano - *Terna Rete Italia, Italy*

A4.4 ■ Optimal Bidding Zone Configuration: Investigation on Model-based Algorithms and their Application to the Italian Power System ■ Luigi Michi - *Terna, Italy*; Enrico Maria Carlini, Mauro Caprabanca, Federico Quaglia, Luca Luzi, Giuseppina Nuzzo - *Terna Rete Italia, Italy*; Ettore Bompard, Gianfranco Chicco, Pietro Colella, Andrea Griffone, Andrea Mazza, Angela Russo - *Politecnico di Torino, Italy*; Cristian Bovo, Valentin Ilea - *Politecnico di Milano, Italy*

A4.5 ■ Compliance of GAUDI Unique Plants Data Management system to the Commission Regulation (EC) No 714/2009 ■ Rosa Cataldi, Stefano Neri, Claudio Liuni - *Terna, Italy*

A4.6 ■ Algorithms for proper power rating of electrochemical storage systems integrated into generation plants ■ Rosa Cataldi, Stefano Neri, Claudio Liuni - *Terna, Italy*

A4.7 ■ Benefit assessment of installing innovative conductors in overhead lines ■ Roberto Benato, Roberto Caldon, Antonio Chiarelli, Massimiliano Coppo, Sebastian Dambone Sessa - *University of Padova, Italy*; Debora Mimo - *Deangeli Prodotti, Italy*; Michele Modesti, Francesca Piovesan - *University of Padova, Italy*

09,00 ■ 11,00 ROOM B ■ Technical Session B4

E-mobility & Shipboard Applications

Chair: Eugenio Fedeli - *Rete Ferroviaria Italiana, Italy*

B4.1 ■ Emergency supply to safety systems of long railway tunnels ■ Regina Lamedica, Fabio Massimo Gatta, Samuel Mikhael, Alessandro Ruvio - *Sapienza University of Rome, Italy*; Guido Guidi Buffarini, Massimo Castellani - *Italfer, Italy*

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B4.2 ■ Train braking impact on energy recovery: the case of the 3 kV d.c. railway line Roma-Napoli via Formia ■ Claudio Spalvieri, Irene Rossetta - *Rete Ferroviaria Italiana, Italy*; Regina Lamedica, Alessandro Ruvio, Andrea Papalini - *Sapienza University of Rome, Italy*

B4.3 ■ Electro-mechanical modelling and simulation of railroad systems ■ Jiajing Li, Giovanni Lutzemberger, Davide Poli - *University of Pisa, Italy*

B4.4 ■ Modeling and Simulation of Railway Network in Compliance with Technical Specifications for Interoperability ■ Morris Brenna, Federica Foadelli, Carola Leone - *Politecnico di Milano, Italy*; Federico Mauro Casiraghi - *Ferrovienord, Italy*

B4.5 ■ Running Capability Assessment for Rolling Stock According to EU Regulations ■ Dario Genovese, Carmine Zappacosta, Giampaolo Mancini, Giuseppe Pancari, Alessio Papeschi, Laura Foconi - *Italcertifer, Italy*

B4.6 ■ Overview of measurement chain and instrumentation setup for running dynamics on-track tests - normal method - according to EN-14363 standard ■ Carmine Zappacosta, Luca Bocciolini, Fabio Piccioli, Mattia Macherelli - *Italcertifer, Italy*; Daniele Massini - *University of Florence, Italy*; Niccolò Vanni - *Italcertifer, Italy*

B4.7 ■ High Frequency Modeling of Foil Type Transformers for Shipboard Power Electronic Power Distribution Systems ■ Nicola Barbini, Alfredo Contin, Andrea Colavitto, Giorgio Sulligoi, Andrea Vicenzutti - *University of Trieste, Italy*

B4.8 ■ Coherent Radar System compliant with Safety Integrity Level 4 for railway applications under High Risk of Landslides ■ Eugenio Fedeli, Vincenzo Calà, Mirco Gonnelli, Mirko Ermini, Antonio Rossetti - *Rete Ferroviaria Italiana, Italy*

09,00 ■ 11,00 ROOM C - Technical Session C4

Resilience of Electrical Networks

Chair: Massimo Pompili - *Sapienza University of Rome, Italy*

C4.1 ■ A new approach for sending dispatching orders using protocol IEC 60870-5-104 ■ Enrico Maria Carlini, Edmondo Coppoli, Marco Fazion, Patrizio Ferretti, Stefano Neri, Laura Campisano, Luciano Zaretti, Giandomenico Lattuada - *Terna Rete Italia, Italy*

C4.2 ■ Assessment and possible solution to increase resilience: heat waves in Terni distribution grid ■ Tommaso Bragatto, Fabrizio Cortesi - *Sapienza University of Rome, Italy*; Massimo Cresta - *TDE, ASM Terni, Italy*; Fabio Massimo Gatta, Alberto Geri, Marco Maccioni - *Sapienza University of Rome, Italy*; Marco Paulucci - *TDE, ASM Terni, Italy*

C4.3 ■ The contribution of the revitalization of submarine cables 110 kV to resilience of the southern part of the Croatian power system ■ Igor Mladinic - *HOPS, Croatia*; Miro Mesic - *Energy Consultant, Croatia*; Srecko Aljinovic - *HOPS, Croatia*

C4.4 ■ Faults Evaluation of MV Underground Cable Joints ■ Luigi Calcara - *Sapienza University of Rome, Italy*; Luigi D'Orazio, Maurizio Della Corte, Guglielmo Di Filippo, Alessio Pastore, Davide Ricci - *E-distribuzione, Italy*; Massimo Pompili - *Sapienza University of Rome, Italy*

C4.5 ■ A Experimental Validation of Frequency Model for Studying a Real Black Start Restoration ■ Roberto Benato - *University of Padova, Italy*; Gianluca Bruno - *Terna, Italy*; Sebastian Dambone Sessa - *University of Padova, Italy*; Giorgio Giannuzzi, Luca Ortolano - *Terna, Italy*; Gianni Pedrazzoli - *University of Padova, Italy*; Michele Poli - *Terna, Italy*; Francesco Sanniti - *University of Padova, Italy*; Roberto Zaottini - *Terna, Italy*

C4.6 ■ A Decision Support System for Mitigating the Seismic Risk of Electric Distribution Networks: learnings from the Central Italy earthquake sequence 2016-2017 ■ Sonia Giovinnazzi, Antonio Di Pietro, Maurizio Pollino, Luigi La Porta, Alberto Tofani, Vittorio Rosato - *ENEA, Casaccia Research Centre, Italy*

C4.7 ■ New Concepts on Microgrid-Prosumer Interaction ■ Francesco Muzi, Mario Gimenez De Lorenzo, Marco Consolidani - *University of L'Aquila, Italy*

C4.8 ■ Impact of snow storms on distribution grids: e-distribuzione and RSE experimental stations ■ Elvira Amicarelli, Mauro De Masi, Giovanni Valtorta - *E-Distribuzione, Italy*; Pietro Marcacci, Matteo Lacavalla - *RSE, Italy*

09,00-11,00 ROOM D ■ Special Session

Sustainability - Convergence towards a shared definition

Chair: Vittorio Cecconi - *Università di Palermo, Presidente ASTRI*

Introduction ■ Vittorio Cecconi - *Università di Palermo, Presidente ASTRI*

Sustainability of a pervasive telecommunication system ■ Giovanni Cancellieri - *Università Politecnica delle Marche, Italy*

Virtual Society of IoT Robosats and Emancipation of Electrical Utilization ■ Giuseppe Parise - *Sapienza Università di Roma*; Luigi Parise - *Bambino Gesù Pediatric Hospital IRCCS*; Francesco Di Paolo - *Professional Engineer*

Infrastructure Design Shared with Territory Inhabitants ■ Adel Motawi, Giampaolo Felli - *Terna*

Sustainability of a Transportation System ■ Luigi Schirone - *Sapienza Università di Roma*

Sustainability in the relationship distributor-provider-user ■ Francesco Cangialosi, Giacomo Trupia - *AEIT*

11,00 ■ 11,15 Break

Friday, September 20, 2019

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Friday, September 20, 2019

11,15 ■ 13,15 ROOM A ■ Technical Session A5

Energy storage in support of power grids: from field experience to new projects, steering along regulatory and market evolution

Chairs: Silvia Canevese - *Ricerca sul Sistema Energetico - RSE, Italy* and Giovanni Lutzemberger - *University of Pisa, Italy*

A5.1 ■ Optimal Sizing Tool for Batteries Providing Multiple Services to the System ■ Dario Siface, Silvia Canevese - *RSE, Italy*

A5.2 ■ The evolution of the Italian power system in 2030 to support more than 55% of renewables on electricity consumption ■ Fabio Lanati, Alberto Gelmini, Giacomo Viganò - *RSE, Italy*

A5.3 ■ Aging test protocol for Lithium-ion cells ■ Luigi Pellegrino, Enrica Micolano - *RSE, Italy*

A5.4 ■ EV Flexibility Supply via Participation in Balancing Services: Possible Profitability for Italian End Users ■ Silvia Canevese, Diego Cirio, Massimo Gallanti, Antonio Gatti - *RSE, Italy*

A5.5 ■ A Probabilistic Approach to Assess the Requirements of an Ultra-Fast PEV Charging Station in Extra-Urban Contexts ■ Elio Chiodo, Diego Iannuzzi, Fabio Mottola, Mario Pagano, Daniela Proto - *University of Naples Federico II, Italy*

A5.6 ■ Preliminary Economic Assessment for Electric Buses Adoption in the Italian Framework ■ Claudio Carlini, Diana Moneta - *RSE, Italy*

11,15 ■ 13,15 ROOM B ■ Technical Session B5

Smart Systems and Emerging Technologies

Chairs: Livio Baldi and Antonio Imbruglia - *AEIT-AMES, Italy*

B5.1 ■ Nonlinear optimal control for the fire-truck robotic vehicle ■ Gerasimos Rigatos - *Industrial Systems Institute, Greece*; Krishna Busawon - *Northumbria University, United Kingdom*, Pierluigi Siano - *University of Salerno, Italy*; Masoud Abbaszadeh - *General Electric, USA*

B5.2 ■ Nonlinear optimal control of the vertically take-off and landing aircraft ■ Gerasimos Rigatos - *Industrial Systems Institute, Greece*; Krishna Busawon - *Northumbria University, United Kingdom*; Masoud Abbaszadeh - *General Electric, USA*

B5.3 ■ Gait Learning Using Reinforcement Learning ■ Bharath Raj Mahadeva Rao, Sharmila Chidaravalli - *Global Academy of Technology, India*

B5.4 ■ Reducing Electromagnetic Interferences on Power Planes of High-Speed Circuits by means of a High-Impedance Electromagnetic Surface ■ Giovanni Aiello, Salvatore Alfonzetti, Emanuele Diletto, Angelo Raciti, Santi Agatino Rizzo, Nunzio Salerno - *University of Catania, Italy*

B5.5 ■ Feasibility analysis of reliability analysis methods applying in air traffic control system ■ Zhuojia Wang, Xin Jiang, Jian Tang - *Commercial Aircraft Corporation of China, P.R. China*

B5.6 ■ A new IR Laser Sag Meter prototype for remote on line monitoring of high voltage overhead line: a special application ■ Elena Golinelli, Daniele Bartalesi, Gian Mario Ogliari - *RSE, Italy*; Umberto Perini - *Consultant, Italy*

B5.7 ■ Conductive Concrete for Smart Cities Applications ■ Basam Swaked, Nasser Qaddoumi, Sherif Yehia, Shereen Farhana - *American University of Sharjah, United Arab Emirates*, Lim Nguyen - *University of Nebraska-Lincoln, USA*

B5.8 ■ Accurate Single-End and Double-End Fault Location by Traveling Waves: a review with some real applications ■ Andrea Di Tomasso, Giuliana Invernizzi, Giorgio Vielmini - *Schweitzer Engineering Laboratories, Italy*

B5.9 ■ An interoperable tool-chain for energy monitoring applications ■ Davide Brunelli - *University of Trento, Italy*, Tullio Salmon Cinotti, Hugo Woehr, Cristiano Aguzzi, Federico Montori - *University of Bologna, Italy*, Luca Benini - *University of Bologna, Italy and ETH Zurich, Switzerland*

11,15 ■ 13,15 ROOM C ■ Technical Session C5 - Resilience of Electrical Networks and Climate Changes

Chair: Massimo Pompili - *Sapienza University of Rome, Italy*

C5.1 ■ An updated investigation about climate-change hazards that might impact electric infrastructures ■ Paola Faggian, Goffredo Decimi - *RSE, Italy*

C5.2 ■ An harmonized approach to model weather uncertainty and its growing impact on power systems ■ Enrico Maria Carlini, Simone Biondi, Federico Quaglia, Mauro Bonanni, Pietro Capurso - *Terna Rete Italia, Italy*; Nicholas Bonfanti, Stefano Lorenzo, Manuele Aufiero - *Milano Multiphysics, Italy*

C5.3 ■ Flexibility sources for enhancing the resilience of a power grid in presence of severe weather conditions ■ Fabrizio De Caro - *University of Sannio, Italy*; Enrico Maria Carlini - *Terna Rete Italia, Italy*; Domenico Villacci - *EnSiEI, Italy*

C5.4 ■ Terna's experience in avoiding snow and ice sleeves formation on High Voltage overhead line conductors ■ Michele Poli, Giacomo Buora, Antonio Pascucci, Enrico Maria Carlini, Luigi Michi - *Terna, Italy*

C5.5 ■ Forest fire or other dangerous situations: safety procedure for overhead lines ■ Enrico Maria Carlini, Luigi Michi - *Terna, Italy*; Luciano Minto - *Terna Rete Italia, Italy*, Cesarino Genovese, Roberto Foppa, Adriano Fedrizzi - *Terna, Italy*

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C5.6 ■ Analytical modeling of overhead line vulnerability to wet snow events for resilience assessment ■ Andrea Pitto, Diego Cirio, Emanuele Ciapessoni, Giovanni Pirovano - *RSE, Italy*

C5.7 ■ Ballast loads for improving the resilience of the Italian sub-transmission grid against ice and snow events ■ Luigi Michi, Enrico Maria Carlini, Luciano Minto, Alberto Pesce - *Terna*; Luca Buono, Francesco Palone, Francesco Maria Pepe - *Terna Rete Italia, Italy*

C5.8 ■ Dispatching measures for improving the resilience of the Italian sub-transmission grid against ice and snow events ■ Enrico Maria Carlini, Luigi Michi - *Terna, Italy*; Davide Rampazzo, Alessio Marchesin, Cristiano Quaciari, Elena Geremia - *Terna Rete Italia, Italy*; Stefano Quaia - *University of Trieste, Italy*

13,15 ■ 13,30 Conference Closure

Tuesday, September 17, 2019

16,00 ■ 19,00

ROOM C ■ Tutorial 1

A Power Electronics Control Perspective in AC and Hybrid AC&DC Low-Voltage Smart Microgrids ■ Paolo Mattavelli, Tommaso Caldognetto - *University of Padova, Italy*

ROOM D ■ Tutorial 2

Advances in Protection and Monitoring of HV networks: Time-Domain Protection and Traveling Wave Fault location ■ Giorgio Vielmini - *SEL, Italy*

Venue

University of Florence

Complesso Sant'Apollonia ■ Via San Gallo 25 ■ Florence, Italy

On Site Secretariat

The Conference Secretariat will be open on site as follows

Tuesday, September 17 16,00 - 19,00

Wednesday, September 18 9,00 - 18,30

Thursday, September 19 8,30 - 19,15

Friday, September 20 8,30 - 19,15

All data contained in this program are processed in accordance with

Thursday, September 19, 2019

■ **STUDENT CONTEST Poster Session**

SC.1 ■ Modeling Technique of Large Signal Dynamics for Electromagnetic Levitation Melting System ■ Moria Elkayam, Idan Sassonker, Alon Kuperman - *Ben-Gurion University, Israel*

SC.2 ■ IoT Network for Industrial Machine Energy Monitoring ■ Lorenzo Incipini, Tommaso Mancina, Mohamad El Mehtedi, Paola Pierleoni - *Università Politecnica delle Marche, Italy*

SC.3 ■ Predictive Current Control for a Neutral Point Clamped Inverter Considering SiC-MOSFET as Switches and Using a Photovoltaic Power Source ■ Luis Morinigo, Thalia Morel - *Universidad del Cono Sur de las Americas, Paraguay*; Jorge Rodas, Raúl Gregor - *Universidad Nacional de Asunción, Paraguay*

SC.4 ■ Energy Storage Placement in the Transmission Network: A Robust Optimization Approach ■ Nayeem Chowdhury, Giuditta Pisano, Fabrizio Pilo - *University of Cagliari, Italy*

SC.5 ■ Performance Analysis of Power Converters for Stand-alone Hybrid Renewable Energy System for Residential Load ■ Habib Ur Rahman Habib - *Huazhong University of Science and Technology, Wuhan, P.R. China & University of Engineering and Technology, Taxila, Pakistan*

■ **YOUNG AND STUDENT Poster Session & First AEIT Young Members Meeting**

1 ■ Novel Antennas for 5G Applications ■ Enrico Massoni - *Università di Pavia, Italy*

2 ■ Microgrids, energy storage, EVs and evolution of electricity markets: the future of the energy world according to Power System Research Group in Politecnico di Milano ■ Giuliano Rancilio, Filippo Bovera, Ramin Komaie - *Politecnico di Milano, Italy*

3 ■ Idrogeno e Smart Energy ■ Mattia Monte - *AEIT Sezione Friuli- Venezia Giulia*

4 ■ Il rocchetto di Ruhmkorff ■ Giacomo Giannetti - *AEIT Sezione Toscana e Umbria*

Conference Dinner

The conference dinner will be held **Thursday, September 19 - 20,30**
Konnubio Restaurant ■ Via dei Conti 8r ■ Florence

Conference Secretariat

AEIT Ufficio Centrale

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Web Site: <https://convegnae.it/AEIT2019>



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Firenze ■ Italy ■ 18-20 September 2019

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