

AEITHVDC

internationalconference2023

Operational Experience and
Technological Development
for Application Worldwide

Rome Italy ■ May 25-26 ■ 2023



Overview

High Voltage Direct Current HVDC transmission draws an ever increasing interest of TSO in Europe and all over the world.

Major developments in technology make HVDC in many cases more reliable, easy to apply and operate, economically affordable. Wider applications are now possible and many projects are under development, making HVDC an even more interesting business than before also for manufacturers and engineering companies.

AEIT HVDC International Conference 2023 will serve as an International forum for the presentation and exchange of technological advances and research results in the broad fields of HVDC Power Systems applications.

The following issues are within the scope of the conference:

- HVDC operational experience;
- Outlook of HVDC projects planned and at design or construction stage;
- Latest ongoing and next coming developments in HVDC technology converter stations, cables, overhead lines;
- Market perspective.

AEIT HVDC International Conference 2023 will bring together leading utilities, universities, transmission system operators, consultants, equipment suppliers, and solution providers to help shape the future of power transmission industry.



PROGRAMME



with the technical cosponsorship of



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Silvia Moroni • *Terna, Italy*
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Maria Jose Perez Molina • *University of the Basque Country, Spain*
Massimo Pompili • *Sapienza University of Rome, Italy*
Massimo Rebolini • *CIGRE Italia, Italy*
Eleonora Riva Sanseverino • *University of Palermo, Italy*
Luis Vaccaro • *University of Genova, Italy*
Dirk Van Hertem • *KU Leuven, Belgium*

Thursday, May 25

9:30/17:00

09:30 ▶ Registration

10:30 ▶ Welcome Statements

Giuseppe Parise • *AEIT General President*
Stefano Massucco • *AEE Society of AEIT Chair*
Enrico Maria Carlini • *AEIT and CIGRE Italian National Committee Chair*
Gianfranco Chicco • *IEEE Italy Section Chair*
Massimo Pompili • *AEIT Sezione di Roma Chair*
Carlo Massimo Casciola • *Dean of Faculty of Engineering, Sapienza University of Rome*

11:00 ▶ Round Table

News and Perspectives for HVDC in the European networks

Chair: Dirk Van Hertem • *KU Leuven*

Participants:

Temistocle Baffa Scirocco • *Terna*
Paolo Bordignon • *Rongxin HUIKO Electric*
Bruno Cova • *CESI*
Chiara Gandolfi • *Ricerca sul Sistema Energetico - RSE*
Mauro Monge • *Hitachi Energy*
Davide Pietribiasi • *Prysmian Group*

13:00 ▶ Lunch

14:30 ▶ Technical Session I ▶ Operation experience and project implementation

Chair: Roberto Caldon • *AEIT*

▶ **01_01 • A sustainable design for the new 500 kV HVDC Italian OHLs** • Luca Buono, Maria Rosaria Guarniere, Massimo Marzinotto, Francesco Palone, Lorenzo Papi, Roberto Spezie, Gabriele Tresso, Pierluigi Vacante - *Terna, Italy*; Alberto Pignini, Rosario Cortina - *Italy*

▶ **01_02 • Assessment of technical and economic elements for HVAC-to-HVDC OHL conversion in Sicilian grid** • Lorenzo Vitulano, Angelo L'Abbate - *Ricerca sul Sistema Energetico - RSE, Italy*; Sebastian Dambone Sessa - *University of Padua, Italy*; Roberto Calisti - *Ricerca sul Sistema Energetico - RSE, Italy*; Francesco Sanniti - *University of Padua, Italy*

▶ **01_03 • Experience on HVDC disconnectors: sizing and performance of the dielectric in conditions of pollution and ice** • Eros Stella, Marco Nosilati - *GE Vernova, Italy*

▶ **01_04 • Feasibility of HVDC Connection for Offshore Wind Farms in Italy** • Francesco Lanni, Davide Airoldi, Igor Galbiati, Roberto Naldi, Giovanni Pirovano, Laura Serri - *Ricerca sul Sistema Energetico - RSE, Italy*

▶ **01_05 • Commutation Failure Immunity Monitoring: the Italian Operation Experience** • Roberto Gnudi, Giorgio Giannuzzi, Cosimo Pisani, Michael Noce, Andrea Porcu, Guido Coletta - *Terna, Italy*

15:45 ▶ Technical Session II ▶ Modelling, Analysis, and Control I

Chair: Massimo Pompili • *AEIT Sezione di Roma*

▶ **02_01 • Grid-Forming Operation of the HVDC Tyrrhenian Link-East for Improved Frequency Transients** • Rossano Musca, Eleonora Riva Sanseverino, Antony Vasile, Gaetano Zizzo - *University of Palermo, Italy*; Adriano Iaria, Angelo L'Abbate, Lorenzo Vitulano - *Ricerca sul Sistema Energetico - RSE, Italy*

▶ **02_02 • Simulation of Sapei HVDC using Modelica language** • Mohammad Babaeifar, Stefano Barsali, Massimo Ceraolo - *University of Pisa, Italy*

▶ **02_03 • Opportunities and Challenges in the Mediterranean Region with Grid Forming Control for HVDC Systems** • Arman Derviskadic, Alberto Persico, Emir Isabegovic, Anton Thorslund - *Hitachi Energy, Sweden*

▶ **02_04 • Assessment of arc current extinction time of transient faults in HVDC-VSC systems with Hybrid DC Breakers** • Samuel De Maria, Massimo Marzinotto, Francesco Palone, Sino Patti - *Terna, Italy*; Fabio Massimo Gatta, Marco Graziani, Stefano Lauria - *Sapienza University of Rome, Italy*

▶ **02_05 • A multi-GW energy hub for Southern Europe: the Mediterranean energy island proposal** • Giacomo Bastianel, Hakan Ergun, Dirk Van Hertem - *KU Leuven, Belgium*

17:00 ▶ Closure

20:30 ▶ Conference Dinner

Friday, May 26

9:30/17:15

09:30 ▶ **EU Commission's SET PLAN HVDC**

Chairs: Angelo L'Abbate • *Ricerca sul Sistema Energetico - RSE*
Eleonora Riva Sanseverino • *University of Palermo*

Participants:

Marcello Capra • *MASE*
Nicolao Cutululis • *DTU*
Arman Derviskadic • *Hitachi Energy*
Marco Marelli • *Prysmian Group*
Massimo Marzinotto • *Terna*
Giovanni Mazzanti • *University of Bologna*
Dirk Van Hertem • *KU Leuven*

11:30 ▶ **Coffee break**

11:45 ▶ **Technical Session III ▶ Modelling, Analysis, and Control II**

Chair: Stefano Massucco • *AEIT-AEE*

- ▶ **03_01 • HVAC Submarine Cable Loss Reduction at Variable Voltage Level** • Stefano Lauria, Riccardo Loggia, Luigi Calcara, Luigi Martirano, Massimo Pompili - *Sapienza University of Rome, Italy*
- ▶ **03_02 • The new resources to mitigate the impact of the HVDC-LCC on Voltage Control** • Chiara Vergine, Giorgio Giannuzzi, Benedetto Aluisio, Laura Campisano - *Terna, Italy*
- ▶ **03_03 • Integrating of HVDC with High Voltage Grid for Minimizing Short Circuit Level and Voltage Profile of Iraqi Network** • Ali Hassan Al-Tae, Ali Altahir, Yasser Alkhafaji - *University of Kerbala, Iraq*
- ▶ **03_04 • Analysis of the Chilean Power System Performance considering a Long Distance HVDC Transmission Line** • Sebastián Reyes, Luis Morán - *Universidad de Concepción, Chile*; Luis Vaccaro - *University of Genoa, Italy*; Jose Espinoza - *Universidad de Concepción, Chile*
- ▶ **03_05 • Comparative Performance Analysis of HVDC and HVAC Transmission Systems in the Presence of PV Generation: A Case Study using IEEE-5-Bus Network** • Osama Saadeh, Baher Abu Sba, Zakariya Dalala - *German Jordanian University, Jordan*; Ahmad Bashaireh - *Jordan University of Science and Technology, Jordan*
- ▶ **03_06 • The NEWGEN European Union Research Project for a New Generation of HVDC Cable Systems** • Giovanni Mazzanti - *University of Bologna, Italy*; Mika Paaajanen, Ilkka Rytöluoto - *VTT Technical Research Centre of Finland, Finland*; Janne Harjuhahto - *Maillefer Extrusion Oy, Finland*; Andrea Caprara - *Altanova group, Italy*; Frederik Wurm - *University of Twente, The Netherlands*; Kari Lahti - *Tampere University, Finland*; Andreas Ciroth - *GreenDelta, Germany*; Anais Leproux - *SuperGrid Institute, France*; Merie Kannampuzha - *CLIC Innovation Oy, Finland*; Chiara Vergine - *Terna Rete Italia, Italy*

13:15 ▶ **Lunch**

14:30 ▶ **Technical Session IV ▶ System Components: Technologies**

Chair: Giovanni Mazzanti • *University of Bologna*

- ▶ **04_01 • Smooth Interfacing of HVDC Converters and HVDC Cables** • Manuel Weiland, Volker Hussennether, Marcos Gimenes Christianini de Abreu - *Siemens Energy, Germany*
- ▶ **04_02 • Sustainability and technical constraints for HVDC conversion of HVAC overhead lines** • Luca Buono, Maria Rosaria Guarniere, Francesco Palone, Lorenzo Papi, Roberto Spezie, Gabriele Tresso, Massimo Marzinotto - *Terna, Italy*; Alberto Pigni, Rosario Cortina - *Italy*
- ▶ **04_03 • Technology outlook and power system development opportunities to strengthen the Transmission System in the Mediterranean region** • Arman Derviskadic, Alberto Persico, Mauro Monge, Peter Lundberg, Andrea Grondona - *Hitachi Energy, Sweden*; Enrico Maria Carlini, Temistocle Baffa Scirocco, Domenico Iorio, Andrea Urbanelli - *Terna, Italy*
- ▶ **04_04 • HVDC Sea Return Electrodes and oil/gas infrastructures: technical challenges and their effective mitigations** • Massimo Brignone, Daniele Mestriner, Mario Nervi - *University of Genoa, Italy*
- ▶ **04_05 • Power System Resilience Improvement Provided by VSC-HVDC Link Flexibility** • Davide Lauria, Fabio Mottola, Giuliano Grieco - *University of Naples Federico II, Italy*; Cosimo Pisani, Giorgio Giannuzzi - *Terna, Italy*
- ▶ **04_06 • Critical Review of Cigrè Technical Brochure 852** • Giovanni Mazzanti - *University of Bologna, Italy*; Massimo Marzinotto, Antonio Battaglia - *Terna, Italy*

16:00 ▶ Technical Session V ▶ System Components: Tests

Chair: Mario Nervi • *University of Genoa*

▶ **05_01 • Behaviour of HVDC cables under variable load conditions: PD detection and recognition**
• Alessio Di Fatta, Pietro Romano - *University of Palermo, Italy*; Giuseppe Rizzo - *Prysmian Group, Italy*;
Antonino Imburgia, Fabio Viola, Guido Ala - *University of Palermo, Italy*

▶ **05_02 • Qualification and Sea Trial Tests for the 500 kV Tyrrhenian Link HVDC Cable System** • Antonio Battaglia, Andrea Cavaliere - *Terna, Italy*; Luca Biotto, Michele Fontana, Marco Canova - *Prysmian Group, Italy*;
Giovanni Mazzanti - *University of Bologna, Italy*

▶ **05_03 • Long tail withstand voltage test (TOV test) on the HVDC cable and accessories of the Italy-France inertia** • Antonio Battaglia, Riccardo De Zan, Massimo Marzinotto, Francesco Palone, Sino Patti - *Terna, Italy*; Grazia Berardi, Marco Albertini, Stefano Franchi Bononi - *Prysmian Group, Italy*

▶ **05_04 • Type tests for Hybrid HVDC Breakers: a technical feasible solution** • Sino Patti, Massimo Marzinotto, Giuseppe Pelliccione - *Terna, Italy*; Roy Nijman, Shankar Subramany - *KEMA Labs, The Netherlands*

▶ **05_05 • Switching Overvoltages and Polarity Reversal in presence of HVDC Circuit Breakers** • Luca Buono, Francesco Palone, Lorenzo Papi, Roberto Spezie, Gabriele Tresso, Pierluigi Vacante - *Terna Rete Italia, Italy*; Stefano Lauria, Francesca Pizzimenti, Fabio Giulii Capponi - *Sapienza University of Rome, Italy*

17:15 ▶ Conference Closure

Venue

Sapienza University of Rome Faculty of Engineering
Via Eudossiana 18 • Rome, Italy

On Site Secretariat

The Conference Secretariat will be open on site as follows

Thursday, May 25, 2023 9:30 • 17:30

Friday, May 26, 2022 09:00 • 17:30

Secretariat

AEIT • Via M. Macchi 32 • 20124 Milano, Italy

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Website: <https://convegni.aeit.it/HVDC2023>

