

Innovation for efficient and effective management, solutions for power systems of the future!

University "Politehnica" of Bucharest, Romania
Regional South-East European Conference

RSEEC 2020



WITH SUPPORT OF



CO-ORGANIZERS:



FOREWORD

On behalf of the Romanian National Committee of CIGRE, it is our great pleasure to welcome our distinguished guests of the third edition of CIGRE Regional South-East European Conference (RSEEC 2020), taking place in Bucharest, Romania, during October 12th - 14th, 2020.

The CIGRE's Romanian National Committee, as organizer, CNTEE Transelectrica (the Romanian TSO), University "Politehnica" of Bucharest – The Faculty of Power Engineering as co-organizers, A-LSTR (Live Working Association from Romania), and SIER (the Society of Power Engineers in Romania), CNR-CME (Romanian National Committee World Energy Council), The Stefan cel Mare University of Suceava and the Energy Commission of the Technical Sciences Department of the Romanian Academy as partners, invite you to CIGRE Regional South-East European Conference (RSEEC 2020), that takes place during October 12th – 14th 2020, at University "Politehnica" of Bucharest, Romania – event organized with the support of CIGRE Paris.

At its fifth edition, it is a major biennial event in power systems which will provide an exceptional venue to CIGRE members and interested parties for presenting: Innovation for efficient and effective management, solutions for power systems of the future!

The conference brings together power systems engineers, decision makers, economists, academics, students and others with interest in the domain.

The best papers will be proposed by the Technical Committee for publishing in scientific magazine "Buletinul Universitatii Politehnica din Bucuresti", C serie, with International Scientific Indexing.

The conference also promotes CIGRE, the world largest organization in power sector, as a strong technical

organization e2e (end to end), capable of contributing to the technical expertise and know-how through its study committees, conference proceedings and the technical documents.

"Next Generation in Energetics" is a competition with prizes that also offers the opportunity for students / master students / PhD students to present their results (both theoretical and technological) in a different context to university, in the presence of power specialist from over 12 countries.

Main Topics include:

- 1. State of the Technology for electrical networks of the future:**
 - Digital Substations;
 - Power System, Electricity Highways;
 - Power Electronics, FACTS;
 - New equipment, environment, sustainability;
 - Active transmission and distribution networks;
 - New concept in planning and operation.
- 2. Electricity-key factor for society development:**
 - Smart cities:
 - Cyber security;
 - Electrical transport.
 - RES technologies:
 - Energy storage;
 - Energy efficiency.
- 3. Challenges in education of power system workforce:**
 - Education and training;
 - R&D programs application.

The Romanian National Committee of CIGRE,

Dr. Ciprian Diaconu
Chairman

Dr. Constantin Moldoveanu
Vice-Chairman

Dr. Dorin Ioan Hategan
Secretary



October 10th - 12th 2012, Sibiu, Romania.

RSEEC 2012 [first edition] Summary

The CIGRE Romanian National Committee as organizer and CNTEE Transelectrica (the Romanian TSO) and ALSTR (the Romanian technical authority in the field of Live Maintenance), as co-organizers, would like to thank to all participants for their kind contribution to the success of the first edition of the Biyearly Regional South East European Conference 2012 - RSEEC 2012 - the international event that took place on October 10th - 12th 2012, at Hilton Hotel, Sibiu, Romania.



As a short summary, we may say that RSEEC 2012 meant:

- 65 articles presented during 3 days ;
- 142 registered participants coming from 12 countries and a wide area of interest (public power companies, universities, power private sector, etc.), from the national level or abroad;
- 2 live presentations on live-working, etc.





October 8th – 10th, 2014, Timisoara City, Romania.

RSEEC 2014 [second edition] Summary

The CIGREs Romanian National Committee, as organizer, CNTEE Transelectrica (the Romanian TSO) and ALSTR (the Romanian technical authority in the field of Live Maintenance), as co-organizers, would like to thank to all participants for their kind contribution to the success of the second edition of the Biyearly Regional South East European Conference - RSEEC 2014 - the international event that took place on October 8th – 10th, 2014, Timisoara Hotel 4*, Timisoara City, Romania.



As a short summary, we may say that RSEEC 2014 meant:

- 57 articles presented during 3 days;
- 138 registered participants coming from 10 countries and a wide area of interest (public power companies, universities, power private sector, etc.), from the national level or abroad;
- A round table “Live Maintenance in Romania” & a Book presentation : “Sibiu and Romania electrification”.





RSEEC 2016 [third edition] Summary

The CIGRE's Romanian National Committee, as organizer, CNTEE Transelectrica (the Romanian TSO), and University "Politehnica" of Bucharest (the largest and the oldest technical university in the country and among the most prestigious universities in Romania), as co-organizers, would like to thank to all participants for their kind contribution to the success of the third edition of the Biyearly Regional South East European Conference - RSEEC 2016 - the international event that took place on October 10th – 12th 2016, at University "Politehnica" of Bucharest, Romania – event organized with the support of CIGRE Paris.

As a short summary, we may say that RSEEC 2016 meant:

- 43 articles presented during 3 days;
- 126 registered participants coming from 8 countries and a wide area of interest (public power companies, universities, power private sector, etc.), from the national or international companies;
- The conference included 5 tutorials, technical paper sessions and a 3 days exhibition



Regional South-East European Conference RSEEC 2018



RSEEC 2018 [fourth edition] Summary

The CIGRE's Romanian National Committee, as organizer, CNTEE Transelectrica (the Romanian TSO), University "Politehnica" of Bucharest, "Gheorghe Asachi" Technical University of Iasi and the Energy Commission of the Technical Sciences Department of the Romanian Academy as co-organizers, invite you to CIGRE Regional South-East European Conference (RSEEC 2018), would like to thank to all participants for their kind contribution to the success of the fourth edition of the Biyearly Regional South East European Conference – RSEEC 2018 – the event that took place during October 3rd – 5th 2018, at University "Politehnica" of Bucharest, Romania – event organized with the support of CIGRE Paris.

As a short summary, we may say that RSEEC 2018 meant:

- 32 articles presented during 3 days;
- 130 registered participants, coming from 12 countries and a wide area of interest (public power sector, universities, power private sector, etc.), from national or international companies;
- The conference included 6 tutorials, technical paper sessions and a 3 days exhibition.



COMPANIES IN BRIEF

ORGANIZER:



Association of the Romanian National Committee CNR-CIGRE is officially recognized as the Romanian representative of the Board of International Council on Large Electric System (Conseil International des Grands Réseaux or Electriques), based in Paris, CIGRE hereinafter. CNR-CIGRE association is an independent, nongovernmental, apolitical nature, non-profit organization, according to the act of will expressly manifested in the constitutive acts by the founding members. The association has a technical & scientific profile. Currently CNR-CIGRE records 157 individual members and 32 corporate members.

www.cigre.org.ro

CO - ORGANIZERS:



CNTEE TRANSELECTRICA is the Romanian Transmission and System Operator (TSO).

Transelectrica is the Romanian Transmission and System Operator (TSO) which plays a key role in the Romanian electricity market.

Manages and operates the electricity transmission system and provides the electricity exchanges between the central and eastern European countries as an ENTSO-E member (European Network of Transmission and System Operators for Electricity). Transelectrica is responsible for electricity transmission, system and market operation, grid and market infrastructure development ensuring the security of the Romanian power system. It also serves as the main link between electricity supply and demand, matching all the times power generation with demand.

www.transelectrica.ro



University POLITEHNICA of Bucharest is the largest and the oldest technical university in the country and among the most prestigious universities in Romania.

The tradition of our institution, developed in over 190 years through the effort of the most important nation's schoolmasters and of the generations of students, is not the only convincing reason. Today, the POLITEHNICA University of Bucharest is undergoing a continuous modernization process, being involved in a permanent dialogue with great universities in Europe and all over the world.

The mission of the University POLITEHNICA of Bucharest has been thought over as a blend of education, research and innovation, which represents a key towards a knowledge-based society and economy. Creating knowledge mainly by scientific research, giving it out by education and professional training, disseminating it by information technologies, as well as the use of technological innovation are elements that define the university distinctive profile.

The University POLITEHNICA of Bucharest wants to be present among the universities in Europe able to design and optimize processes that lead to a knowledge-based society, to reaching the goals of the sustainable economic growth, to better jobs, to stronger economic and social cohesion, in compliance with the provisions of the 2002 European Council in Lisbon and European Council in Barcelona in the same year:

www.upb.ro

WITH SUPPORT OF



CIGRE Central Office which is based in Paris France, counts 58 National Committees to enhance its relationship and get closer to its Members. CIGRE National Committees offer to its Members direct access to services and supports. CIGRE counts more than 14 000 equivalent Members composed of researchers, academics, engineers, technicians, suppliers, and other decision makers, in over 90 countries.

More than 3,500 experts from across the globe actively collaborate in structured work programmes with CIGRE. Their efforts are coordinated by 16 Study Committees which are overseen by a Technical Committee. Research efforts are anchored to four interlinked objectives : designing and deploying the power system of the future, optimizing existing equipment and power systems, respecting the environment, and offering access to information to international key players in the electrical power systems' industry

www.cigre.org

PARTNERS:



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RSEEC 2020 (5th edition)
October 12rd - 14th 2020
University "Politehnica" of Bucharest, Romania

PROGRAM

Monday, October 12, 2020

- 10:30 - 11:00 Registration
- 11:00 - 13:00 **Opening Plenary**
Official opening of the SCADA Problem Studies Laboratory at UPB Faculty of Energy
- 13:00 - 15:00 **Tutorial 1:** Revision of IEC60296, IEC60422 and changes to new edition, Bruce Pahlavanpour
Tutorial 2: Hydrogen and Sector Coupling on the Road towards Deep Decarbonization, Alexander Peschl

Tuesday, October 13, 2020

- 11:00 - 12:00 **Session 1 Chair Constantin Bulac**
Determination of the overvoltages generated by the lightning impulse in the windings of high power transformers - analytical method, simulation, experimental tests, M.C. Nițu, A.M. Aciu, M. Nicola, C.I. Nicola, ROMANIA
Using electrical parameters measurement results in protection settings, Gh. Moraru, F. Balasiu, ROMANIA
Probabilistic load flow using Monte Carlo simulation for a distribution electric network including wind farm, C. Ghinea, L. Toma, M. Eremia, I. Triștiu, D. O. Sidea, ROMANIA
Cyber Security in Smart Grid – Fundamentals and Experimental Applications, B. Pușcaș, I. C. Damian, ROMANIA
Comparison of Modelling Approaches for the Romanian Energy System, T.I. Diaconu, S. Candaș, ROMANIA
Considerations regarding coordination overcurrent relays in transmission and distribution networks, A. Miron, C. Popa, C. Bobric, R. Pentiu, M. Pocris, A. Dragomir, ROMANIA
Discussions
- 12:00 - 13:00 **Tutorial 3:** Hitachi ABB Power Grids Mission Critical Communication Solutions, Christian Roth
- 13:00 - 14:00 **Lunch and Break**
- 14:00 - 15:00 **Session 2 Chair Constantin Moldoveanu**
Technical computer apps built on the structure of the unique database, M. N. Oltean, K. Sandor, T. Chiulan, ROMANIA
New biobased, low viscosity and biodegradable insulating oil with more efficient cooling, B. Pahlavanpour, C. P. Wolmarans, SWEDEN
Power Quality system in the low voltage power distribution grid in the context of digitization A. Cojoacă, E. Butoarcă, M. Albă, S. Zamfirache, M. Pașol, A. Grigore, C. Cojoacă, ROMANIA
Participation of the Virtual Power Plants to the frequency control in power systems, L. Toma, D. Sidea, M. Sanduleac, ROMANIA
Pilot Project for monitoring two 400 kV overhead lines from the Romanian Power System to increase the transmission capacity, B. Leu, A. Luca, Lebedov, M. Ferecatu, ROMANIA

Optimizing the operation of 23 overhead power lines in the Romanian Power System by installing on-line monitoring systems O. Lebedov, M. Ferecatu, T. Tudor, B. Leu, R. Dinculescu, ROMANIA

Digital substation vision and future pilot projects in the Romanian Transmission Network, M. C. Marcolt, C. P. Lisman, ROMANIA

Using HIL for testing of Digital Substation and Line protection over MPLS, F. Reis, PORTUGAL

Discussions

15:00 - 16:00

Tutorial 4: Large Overhead Lines (OHL) Crossings, Georgel Gheorghita

Wednesday, October 14, 2020

11:00 - 12:00

Session 3 Chair Ioan Hategan

Deep learning techniques applied in short term load forecasting, A. Tudose, I. Picioroaga, D. Sidea, C. Bulac, ROMANIA

Applications of Lithium-Ion Batteries in Grid-Scale Energy Storage Systems, V. Florea, ROMANIA

Study regarding the use of Li-Ion batteries for the internal services of Romanian TSO's electrical substations, B. Leu, C. Chimirel, O. Lebedov, R. Dinculescu, A. Luca, D. Năstase, ROMANIA

Trend detection in seasonal inflows and the influence on energy generation in Golești hydropower plant, A. Neagoe, E. I. Tică, A. V. Achim, B. Popa, ROMANIA

Securing and Flexibility through News Automation and Real-time Monitoring Solutions in the Low and Medium Voltage Grid, M. Dima, L. Predescu, ROMANIA

Circulation of homopolar currents in medium voltage networks with neutral treated by resistor and shunt switch, I. Marin, E. Butoarca, D. Ursu, F. Bocai, F. Popescu, M. Mircea, A. Butoarca, ROMANIA

Discussions

12:00 - 13:00

Tutorial 5: Reserves providers from ancillary services to standard reserves, Doina Ilisiu

13:00 - 14:00

Lunch and Break

14:00 - 15:30

Session 4 Chair Ciprian Diaconu

Influence of Ground Resistivity in Transmission Line Fault Location, M. Dragomir, A. Dragomir, A. Miron, ROMANIA

Power restoration using Emergency Restoration Tower System, C. M. Ciucanu, ROMANIA

Mobile substation bays for the electrical power system, A. Iamandi, R. Dinculescu, G. Ion, N. Arghira, S. St. Iliescu, ROMANIA

High voltage mobile bays used in Transelectrica, B. Leu, E. Stoicescu, P. Stroiță, D. Bucur, ROMANIA

Dynamic frequency setpoint – A deterministic frequency deviation decreasing method M. C. Tudor, D. T. Ilișiu, ROMANIA

The current situation and future vision of the Romanian TSO regarding GIS equipment monitoring inside the Romanian Transmission Grid, D. Nastase, R. Dinculescu, O. Lebedov, B. Leu, Romania

Fire and Explosion Prevention of Power Transformers, I. Stancu, O. Stancu, T. Chiulan, ROMANIA

Analysis of the technical condition of the transformers in the electric transmission network, R. Dinculescu, B. Leu, O. Lebedov, A. Iamandi, S. Kovacs, ROMANIA

Discussions

15:30 - 15:35

Closing Plenary

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