CIRED Srbija

Transformatorska stanica 110/35/10 kV "Kopaonik"

14 | SAVETOVANJE O ELEKTRODISTRIBUTIVNIM MREŽAMA sa regionalnim učešćem
CONFERENCE ON ELECTRICITY DISTRIBUTION with regional participation

16-20/09/2024, Kopaonik, Serbia

IZVEŠTAJ SA SAVETOVANJA
CONFERENCE REPORT

CIRED

GENERALNI POKROVITELJ / GENERAL ENDORSMENT

Република Србија
Министарство рударства и енергетике
www.mre.gov.rs

ЕЛЕКТРОДИСТРИБУЦИЈА СРБИЈЕ
www.elektrodistribucija.rs

POKROVITELJ / ENDORSEMENT

CEDIS
Crnogorski elektrodistributivni sistem
cedis.me

ZLATNI SPONZORI / GOLDEN SPONSORS

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www.abb.rs

Comel since 1990
www.comel.rs

GE VERNOVA
www.gevernova.com

ENERGOTEHNIKA JUŽNA BAČKA
Znanje u službi kvaliteta.
ELEKTROMONTAŽA KRALJEVO
OSNOVANO 1963.
www.entjuba.rs www.elektromontaza.rs

Nexans ELECTRIFY THE FUTURE
MARTI KOMERC
www.martikom.rs

ELNOS GROUP
www.elnosgroup.com

Solutions for smart energy management
METER&CONTROL
www.meterandcontrol.com

MT-KOMEX D.O.O.
ENERGY SOLUTIONS
www.mt-komex.co.rs

Life Is On Schneider Electric
www.se.com/rs

SIEMENS
www.siemens.rs

TF Kable
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VELIKI SPONZORI / GREAT SPONSORS

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asee.io

crony ZTT 中天科技
www.crony.rs

ELEKTROMETAL PLUS
www.elektrometal.rs

ENELPS
www.enelps.com

EBC ENERGY BRIDGE CONSULTING
www.ebc.rs

Weidmüller
www.weidmuller.com

RITTAL EPLAN
www.rittal.rs / www.eplan.rs

KONVEX ELECTRIC
www.konvex.rs

www.minel-trafo.com

NYNAS PLATTNER
www.nynas.com

noark DEFINITION OF RELIABILITY
www.noark-electric.rs

sne Energy EcoXpert
www.sneenergy.rs

UNIPROM
www.uniprom.rs

SOMBORELEKTRO d.o.o. Sombor
www.somborelektro.rs

SPONZOR KONGRESNOG RANCA / CONFERENCE BAG SPONSOR

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ELEKTRO MERKUR & CTC GLOBAL

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MIKROELEKTRONIKA sitel

Megger. TECTRA

InfoProjekt srcsoft

Kadis Inženjering

LOGISTIČKI / LOGISTICS PARTNER

cargo-partner Member of NEX NIPPON EXPRESS

XIV SAVETOVANJE O ELEKTRODISTRIBUTIVNIM MREŽAMA SRBIJE
sa regionalnim učešćem

Srbija, Kopaonik, Hotel Grand
16-20. septembar 2024.

XIV CONFERENCE ON ELECTRICITY DISTRIBUTION IN SERBIA
with regional participation

Serbia, Kopaonik, Grand Hotel
September 16 –20, 2024

IZVEŠTAJ SA SAVETOVANJA
CONFERENCE REPORT

Organizator:
Nacionalni komitet CIRED Srbija u saradnji sa drugim komitetima i kompanijama i stručnjacima iz zemlje i regiona

Organized by:
CIRED Liaison Committee of Serbia in cooperation with other committees, as well as the companies and experts from the Serbia and the region

www.ciredserbia.org.rs

***Supported by*:**

Organizator: Nacionalni komitet CIRED Srbija u saradnji sa drugim komitetima i kompanijama i stručnjacima iz zemlje i regiona

Nacionalni komitet CIRED Srbije je profesionalna i stručna organizacija, posvećena razmeni znanja i iskustva u oblasti distribucije električne energije. Okuplja istaknute stručnjake iz elektrodistributivnih organizacija, elektrotehničkih fakulteta i instituta, projektnih, izvođačkih i proizvodnih organizacija sa teritorije Srbije i regiona.

www.ciredserbia.org.rs

Organized by: *CIRED Liaison Committee of Serbia in cooperation with other committees, as well as the companies and experts from the Serbia and the region*

CIRED Liaison Committee of Serbia is the professional and expert organization, dedicated to the exchange of knowledge and expertise in the technical field of electricity distribution. It gathers professionals and experts from power distribution companies, electrical engineering faculties and institutes, design, constructing and manufacturing companies from Serbia and the region.

www.ciredserbia.org.rs

Podrška: CIRED (Congrès International des Réseaux Electriques de Distribution) - Međunarodna konferencija za elektrodistribuciju, vodeći forum za susrete međunarodne elektrodistributivne zajednice.

Svrha CIRED-a je da radi na povećanju poslovne sposobnosti, veština i znanja onih koji učestvuju u aktivnostima CIREDa. CIRED svake druge godine organizuje savetovanje i izložbu gde su postavljena najnovija dostignuća i najbolje prakse u tehnologiji i upravljanju tehničkom stranom elektrodistribucije. Između savetovanja CIRED organizuje posebne radne grupe na aktuelne teme koje su od ključnog značaja za elektrodistributivnu zajednicu.

www.cired.net

Supported by: *CIRED* (Congrès International des Réseaux Electriques de Distribution) - *International Conference on Electricity Distribution, the leading forum for international electricity distribution community meets.*

CIRED works for the purposes of increasing the business relevant competencies, skills and knowledge of those participating in CIRED's activities. CIRED offers a biennial conference and exhibition where developments and best practices in technology and management of the technical side of electricity distribution are presented. Between conferences CIRED may organize specific Working Groups on current subjects of key interest to the electricity distribution community.

www.cired.net

Ciljevi savetovanja

Zemlje regiona se nalaze na sličnom tehničkom nivou razvoja i prakse distribucije električne energije i sa sličnim problemima u eksploataciji i upravljanju distributivnim mrežama. Zemlje regiona se nalaze na različitim stepenima procesa restrukturiranja, deregulacije i privatizacije elektroprivrede, ali pred istim ili sličnim izazovima otvaranja tržišta električne energije. Savetovanje treba da obezbedi razmenu znanja i iskustva o zajedničkim problemima razvoja tehnologije, reorganizacije i modernizacije distribucije električne energije u regionu.

Conference objectives

Countries in the region are at the similar technical level and practice in electricity distribution with similar problems in operation and management of distribution networks. They are at different levels of restructuring, deregulation and privatization process of electric power industries but face the same or similar challenges in opening of electricity markets. The Conference aims to enable regional exchange of experience and practice in operation, management, organization, and modernization of electricity distribution.

ORGANIZACIONI ODBOR / *ORGANIZING COMMITTEE*

dr Zoran SIMENDIĆ, Predsednik CIRED Srbija / *Chairman of CIRED LC of Serbia*
Goran RADOVANOVIĆ, potpredsednik CIRED Srbija / *Vice-president of CIRED LC of Serbia*
dr Dragoslav JOVANOVIĆ, Član CIRED Srbija / *Member of CIRED LC of Serbia*
Slobodan KUJOVIĆ, Član CIRED Srbija / *Member of CIRED LC of Serbia*
Saša STEFANOVIĆ, Elektrodistribucija Srbije d.o.o. Beograd / *Power Distribution of Serbia Belgrade*
Marija ERDELJAN, Tehnički sekretar CIRED Srbija / *Technical Secretary of CIRED LC of Serbia*

PROGRAMSKI ODBOR / *PROGRAM COMMITTEE*

dr Vladimir ŠILJKUT, Elektroprivreda Srbije AD / *JSC Electric Power Industry of Serbia*
Prof. dr Vladimir KATIĆ, Fakultet tehničkih nauka, Novi Sad / *Faculty of Technical Sciences, NS*
mr Dušan VUKOTIĆ, Elektrodistribucija Srbije d.o.o. Beograd / *Power Distribution of Serbia Belgrade*
dr Željko POPOVIĆ, Fakultet tehničkih nauka, Novi Sad / *Faculty of Technical Sciences, Novi Sad*
dr Aleksandar JANJIĆ, *GOPA - International Energy Consultants GmbH*, Beograd
dr Nenad KATIĆ, Schneider Electric doo Novi Sad

UVODNA REČ / *INTRODUCTORY WORD*

XIV SAVETOVANJE O ELEKTRODISTRIBUTIVNIM MREŽAMA SRBIJE sa regionalnim učešćem koje se organizuje pod pokroviteljstvom CIRED - Međunarodne konferencije za elektrodistribuciju, a od strane Nacionalnog komiteta CIRED održano je na Kopaoniku, u Hotelu Grand, od 16. do 20. septembra 2024. godine.

Kao i prethodnih godina, Savetovanje je i ove godine ponudilo naučno-stručni i komercijalni sadržaj. Od 95 prijavljenih radova prihvaćeno je 82, dok je prateća izložba okupila 52 kompanije.

Prema izvedenim podacima na skupu je prisustvovalo 776 registrovanih učesnika, kako autora referata i predstavnika firmi koje su učestvovale u komercijalnoj izložbi, tako i onih zainteresovanih za izlaganja autora ili posetu izložbi.

Sastanak izvršnog odbora CIRED SRBIJA održan je u okvru Savetovanja, 19. septembra.

***XIV CONFERENCE ON ELECTRICITY DISTRIBUTION IN SERBIA with regional participation**, supported by CIRED, the International Conference on Electricity Distribution and organized by CIRED Liaison Committee of Serbia was held in Grand Hotel, Kopaonik, September 16-20, 2024.*

As in previous years, the Conference consisted of both scientific and commercial content. From 95 submitted papers 82 have been accepted. The exhibition gathered 52 companies.

According to collected data the Conference was attended by 776 registered participants, including paper authors, representatives of the exhibiting companies, and participants showing interest in both papers and the exhibition.

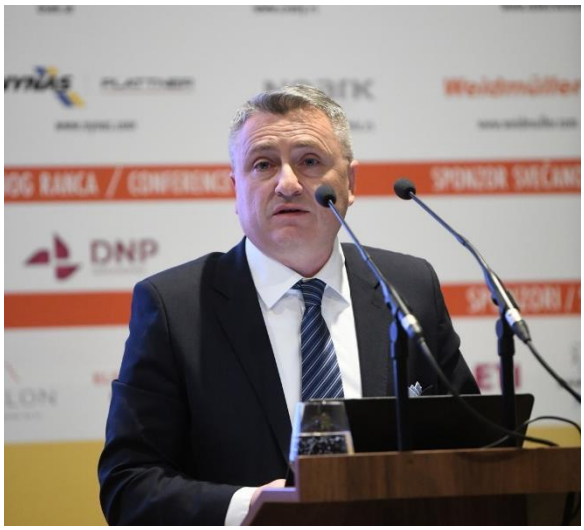
The meeting of the Executive Committee of CIRED SERBIA was held during the Conference, September 19th.

Predsednik Nacionalnog komiteta CIRED Srbija ***President of the CIRED Liaison Committee of Serbia***

DR ZORAN SIMENDIĆ

SVEČANO OTVARANJE / *OPENING CEREMONY*

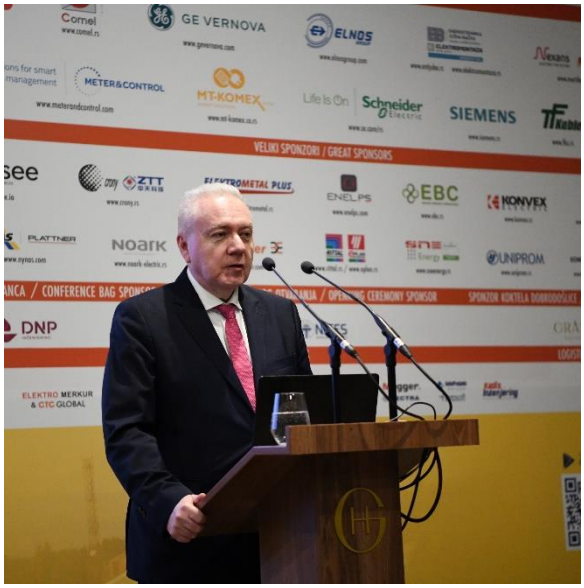
XIV savetovanje o elektrodistributivnim mrežama Srbije sa regionalnim učešćem otvoreno je na svečanoj ceremoniji u Hotelu Grand 16. septembra 2024. godine u 18:00 časova. Ceremoniji otvaranja prisustvovalo je preko 350 ljudi.



Milan Aleksić, savetnik ministarke, Ministarstvo energetike i rudarstva Republike Srbije, zvanično je otvorio XIV Savetovanje.

Predsednik Nacionalnog komiteta CIRED Srbija, dr **Zoran SIMENDIĆ,** održao je kratak uvodni govor kojim je poželeo dobrodošlicu svim učesnicima i sponzorima.

Skup su pozdravili i:



Nebojša PETROVIĆ, savetnik generalnog direktora za tehnička pitanja Akcionarskog društva Elektromreža Srbije i predsednik CIGRE Srbija

Goran KOVAČEVIĆ, predsednik Nacionalnog komiteta CIRED Crna Gora

The XIV Conference on Electricity Distribution of Serbia with regional participation was opened at the official ceremony in the Hotel Grand on September 16, 2024, at 18h. More than 350 participants were present.

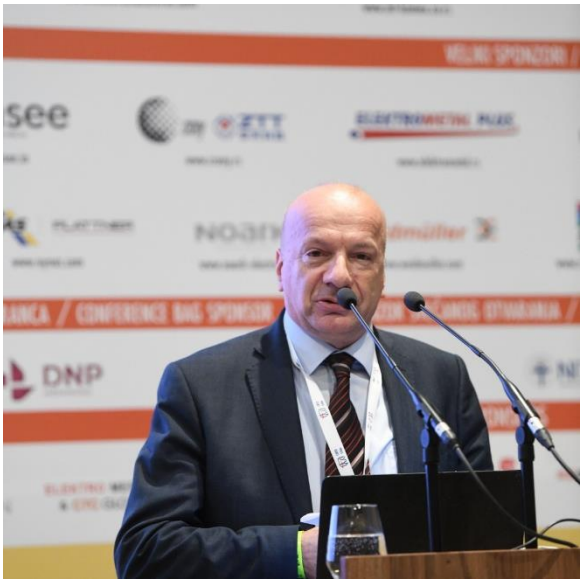
***Milan ALEKSIĆ**, advisor to the Minister, Ministry of Mining and Energy of the Republic of Serbia, officially opened the XIV Conference.*

*President of CIRED Liaison Committee of Serbia, **Zoran SIMENDIĆ, PhD** gave a short introductory speech welcoming all the participants and sponsors.*

The introductory words were also given by:

***Nebojša PETROVIĆ**, representative of AD Elektromreža Srbije and president of CIGRE Serbia*

***Goran KOVAČEVIĆ**, president of the Board of power distribution systems of Montenegro*



***Zijad BAJRAMOVIĆ**, President of the CIGRE Committee of Bosnia and Herzegovina*

Zijad BAJRAMOVIĆ, predsednik Bosanskohercegovačkog komiteta CIGRE

Boris DUMNIĆ, dekan Fakulteta tehničkih nauka Univerziteta u Novom Sadu i predsednik Republičke komisije za energetske mreže

Mileta ŽARKOVIĆ, prodekan za saradnju sa privredom Elektrotehničkog fakulteta Univerziteta u Beogradu

Vladimir IVANOVIĆ, izvršni direktor Crnogorskog elektrodistributivnog sistema

Biljana KOMNENIĆ, direktorka Elektrodistribucije Srbije

Prema tradiciji na Svečanom otvaranju dodeljene su ovim povodom po prvi put statue, umesto plaketa, za doprinos Savetovanju pokroviteljima i sponzorima.

Za doprinos razvoju CIRED Savetovanja u Srbiji:
Prof. dr Nikola RAJAKOVIĆ, Savez energetičara

Generalni pokrovitelj Savetovanja:
Milan ALEKSIĆ, za Ministarstvo rudarstva i energetike Republike Srbije

Biljana KOMNENIĆ, Elektrodistribucija Srbije d.o.o. Beograd

Pokrovitelj savetovanja:
Goran KOVAČEVIĆ, Nacionalni komitet CIRED Crna Gora

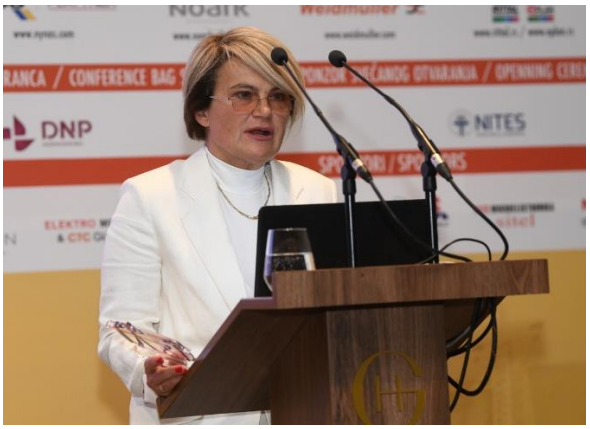
Zlatni sponzori Savetovanja:
Aleksandar ĆOSIĆ, ABB, Beograd
Marko NOVAKOVIĆ, Marti komerc, Beograd
Uroš IVANOVIĆ, COMEL
Borislav MILIVOJČEV, ELNOS Grupa
Mihailo DIVAC, GE Grid Solutions
Marko ISKRIN, Elektromontaža i Enegotehnika Južna Bačka
Igor VUJIČIĆ, Meter&Control
Miloš KOSTIĆ, MT-Komex
Miloš VUKSANOVIĆ, Schneider Electric
Srdan SRDANOVIĆ, Siemens
Ana PIHLER, TF Kable iz Zaječara

***Zijad BAJRAMOVIĆ**, President of the CIGRE Committee of Bosnia and Herzegovina*

***Boris DUMNIĆ**, Dean of the Faculty of Technical Sciences of the University of Novi Sad*

***Mileta ŽARKOVIĆ**, vice dean for cooperation with the economy of the Faculty of Electrical Engineering, University of Belgrade*

***Vladimir IVANOVIĆ**, Executive Director of the Montenegrin Electric Distribution System*



***Biljana KOMNENIĆ**, director of Elektrodistribucija Srbije d.o.o.*

Following the tradition of the CIRED conference, statues, instead of acknowledgements, were handed for contribution to the Conference to endorserers and sponsors.

For contribution to CIRED Conferences in Serbia:
***Prof. dr Nikola RAJAKOVIĆ,** Association of Energy Specialists*

General Endorser of the Conference:
Milan ALEKSIĆ, *for the Ministry of Mining and Energy of the Republic of Serbia*

***Biljana KOMNENIĆ**, Elektrodistribucija Srbije d.o.o. Belgrade*

Endorser of the Conference:
***Goran KOVAČEVIĆ**, Power Distribution Systems of Montenegro*

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***Borislav MILIVOJČEV**, ELNOS Group*
***Mihailo DIVAC,** GE Grid Solutions*
***Marko ISKRIN,** Elektromontaža & Enegotehnika Južna Bačka*
***Igor VUJIČIĆ**, Meter&Control*
***Miloš KOSTIĆ,** MT-Komex*
***Miloš VUKSANOVIĆ,** Schneider Electric*
***Srdan SRDANOVIĆ,** Siemens*
***Ana PIHLER**, TF Kable Zaječar*





Veliki sponzori Savetovanja:
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Darko TODOROVIĆ, Crony
Darko MILUTINOVIĆ, Energy Bridge Consulting
Milan JAĆIMOVSKI, Elektrometal Plus
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Neven KATANIĆ, E-plan
Željko JOVANOVIĆ, Konvex Electric
Aleksandar BOGAVAC, Minel Trafo
Žiko OBRADOVIĆ, NOARK Electric Europe
Danile FRUSTAGLI, Nynas
Marija PAUNOVIĆ, SNE Energy
Mirjana MIRKOVIĆ, SOMBORELEKTRO
Siniša KOCIĆ, Uniprom
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***Neven KATANIĆ**, Eplan*
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***Aleksandar BOGAVAC**, Minel trafo*
***Žiko OBRADOVIĆ**, NOARK Electric Europe*
***Danile FRUSTAGLI**, Nynas*
***Marija PAUNOVIĆ**, SNE Energy*
***Mirjana MIRKOVIĆ**, SOMBORELEKTRO*
***Siniša KOCIĆ**, Uniprom*
***Zoran RABRENOVIĆ**, Weidmuller*

Conference Backpack Sponsor:
***Jasmina POPOVIĆ**, DNP-INŽENJERING*

Opening Ceremony Sponsor:
***Miloš ŽIVANOVIĆ,** NITES*

Welcome Cocktail Sponsor:
***Velibor CVIJANOVIĆ**, Grand Hotel*

UVODNA PREDAVANJA / *INTRODUCTORY LECTURES*

VAŽNOST PLANOVA RAZVOJA MREŽE NA RAZINI OPERATORA DISTRIBUTIVNOG SISTEMA KAKO BI SE OSIGURALO DONOŠENJE ODLUKA O ULAGANJIMA U (PAMETNU) MREŽU

THE IMPORTANCE OF GRID DEVELOPMENT PLANS ON DISTRIBUTION SYSTEM OPERATOR-LEVEL TO ENSURE DECISION MAKING ON (SMART) GRID INVESTMENTS

Marcus MERKEL, konsultant na GIZ projektu Zelena agenda / *consultant on GIZ project Green Agenda*

Oko 2.560 operatora distributivnog sistema (ODS) u Europskoj Uniji (EU) pokrivaju 10 milijuna kilometara distribucijskih mreža, sa širokim spektrom veličina preduzeća i razlikama u nacionalnim koncentracijama. Glavni pokretač donošenja odluka o investicijskim planovima je postojanje sveobuhvatnih planova razvoja mreže. Nadopunjujući ih, nacionalni energetski i klimatski planovi mogu biti efikasni alati u podršsci razvoja distribucijskih mreža, posebno kroz reforme koje trebaju provesti države članice. EU Komisija je u nedavnom Akcijskom planu EU-a za mreže objavljenom krajem novembra 2023. najavila uključivanje specifičnih radnji povezanih s mrežom u iterativni proces s državama članicama na njihovim nacionalnim energetskim i klimatskim planovima. Nadalje, EU je zacrtala niz konkretnih radnji kako bi osigurala spremnost elektroenergetskih mreža da ispune energetske ciljeve. Cilj je osigurati pouzdane, sveobuhvatne, dalekovidne i transparentne razvojne planove distribucijske mreže (RPDM) u cijeloj Europi, jer će to biti bitno za uključivanje obnovljivih izvora energije i fleksibilne potražnje te smanjenje budućih kašnjenja u obradi zahtjeva za priključenje na mrežu. Prezentacija je pružila uvid u trenutne procese planiranja njemačke mreže i status implementacije na razini prijenosa i distribucije, kao i ulogu njemačkih ODS u pružanju planova razvoja mreže na lokalnoj ili regionalnoj razini. Predstavljene su perspektive za sledeće korake na razini EU-a i nacionalnoj razini.

Around 2,560 DSOs in the EU cover 10 million kilometers of distribution grids, containing a wide spectrum of company sizes and disparities in national concentrations. The main driver for making investment plan decisions is having comprehensive network development plans in place. Complementing these, National Energy and Climate Plans can be effective tools in supporting the development of distribution networks, in particular through reforms to be conducted by Member States. The EU Commission has announced in the recent EU Action Plan for Grids released in the end of November 2023 to include specific grid-related actions in the iterative process with Member States on their National Energy and Climate Plans. Furthermore, the EU outlined a series of concrete actions to ensure the readiness of the electricity grids to meet energy targets and ensure they will be rolled out further and faster. The aim is to ensure reliable, comprehensive, forward-looking and transparent distribution network development plans (NDPs) throughout Europe, because this will be essential to incorporate renewables and flexible demand and reduce future connection request delays. The presentation provided insights in the current German Grid planning processes and the status of implementation on transmission and distribution level as well as the role of German DSOs to provide network development plans on local or regional level. An Outlook on next steps on EU and national level was provided.

STUDIJA - INTEGRACIJA „KUPACA-PROIZVOĐAČA“ U ELEKTRODISTRIBUTIVNU MREŽU U REPUBLICI SRBIJI

STUDY - PROSUMER INTEGRATION INTO SERBIAN DISTRIBUTION POWER SYSTEM

doc. dr Goran DOBRIĆ, Elektrotehnički fakultet, Univerzitet u Beogradu / *Faculty of Electrical Engineering, University of Belgrade*

Predavanje je obuhvatilo analizu integracije kupaca-proizvođača u distributivni sistem Srbije, sa fokusom na ključne tehničke, regulatorne i operativne aspekte. Prikazana je ocena trenutnog stanja sistema sa aspekta kupaca-proizvođača, modelovanje potrošnje i proizvodnje iz fotonaponskih sistema, regulatorni okviri za priključenje i uticaj kupaca-proizvođača na performanse i rad distributivnog sistema. Naglašena je potreba za preciznim modelovanjem, ažuriranjem regulative i unapređenjem sistema kako bi se omogućila veća penetracija kupaca-proizvođača.

The presentation covered analysis of the integration of prosumers into Serbia's distribution system, focusing on key technical, regulatory, and operational aspects. It presented an assessment of the distribution system related to prosumers, modeling of consumption and production from photovoltaic systems, regulatory frameworks for connection, and the impact of prosumers on the performance and operation of the distribution system. The need for precise modeling, regulatory updates, and system improvements to facilitate greater prosumer penetration were also emphasized.

PANEL DISKUSIJA – ZELENA AGENDA / *PANEL DISCUSSION – GREEN AGENDA*

TRENUTNI IZAZOVI U OPERATORIMA DISTRIBUTIVNOG SISTEMA NA ZAPADNOM BALKANU

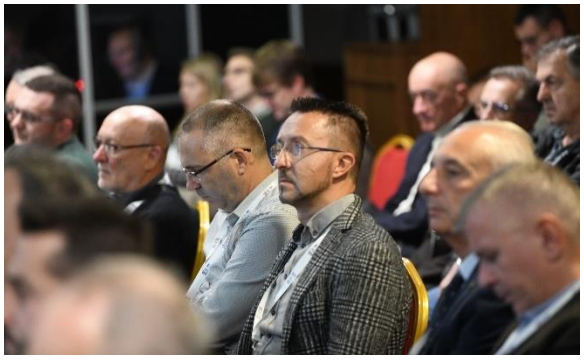
CURRENT CHALLENGES IN DISTRIBUTION SYSTEM OPERATORS OF WESTERN BALKANS

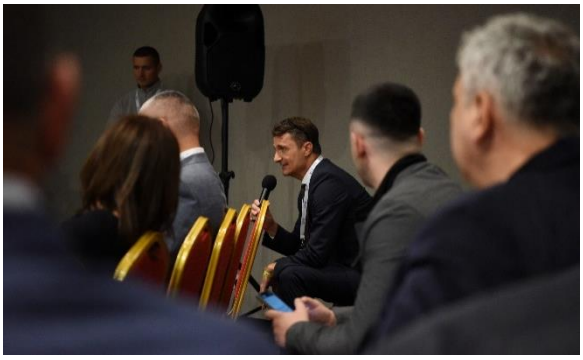
Moderator / *Moderators:* **Dušan VUĆIĆ,** konsultant / *consultant*

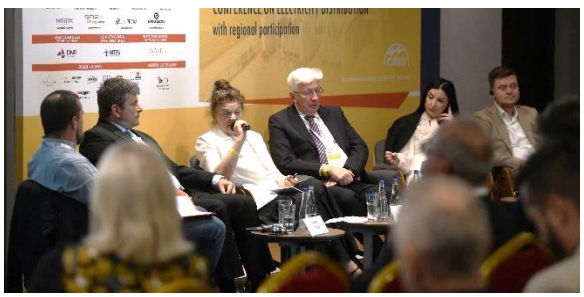
Panelisti / *Panelist:* **Goran KOVAČEVIĆ,** CEDIS
Jagoda LAŽETIĆ, Elektroprivreda Republike Srpske
Dušan VUKOTIĆ, Elektrodistribucija Srbije
Beliola VASJARI, OSHEE Albanija
Nicolas HEGER, GIZ

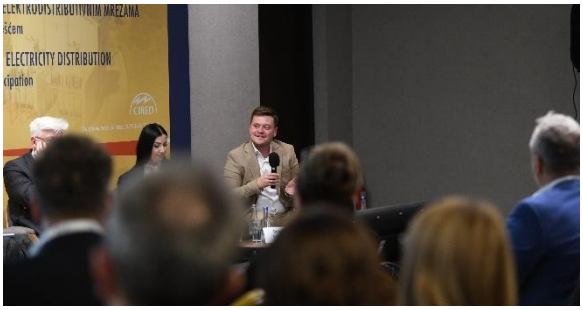
Brza integracija obnovljivih izvora energije (OIE) poput solarne energije i energije vjetra u elektroenergetske mreže Zapadnog Balkana donosi mnoge izazove za operatore distribucijskog sistema (ODS). To uključuje veliki broj zahtjeva za priključenje, povremena i varijabilna zagušenja mreže ali i obrnute tokove energije. Nadalje, u ODS postoji potreba nadogradnje postojeće infrastrukture zajedno s ulaganjima u tehnologije pametnih mreža. Na panelu je diskutovano o navedenim izazovima ali i o trenutnoj saradnji ODS Zapadnog Balkana s GIZ projektom ''Zelena agenda: Dekarbonizacija sektora električne energije na Zapadnom Balkanu''.

The rapid integration of renewable energy sources (RES) like solar and wind power into the Western Balkans' power grids presents several challenges for distribution system operators (DSOs). These include large number of applications for connection, intermittency and variability, grid congestion and reverse power flows. In addition, DSOs need to upgrade existing infrastructure together with investments in smart grid technologies. On panel it was discussed on the above-mentioned challenges but also on the current cooperation of DSOs from Western Balkans with GIZ project ''Green agenda: Decarbonization of Electricity Sector on Western Balkans''.









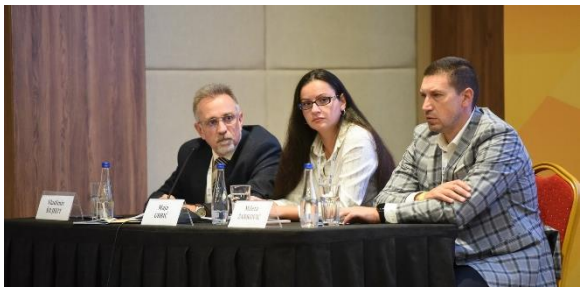
Z A K L J U Č C I S T R U Č N I H K O M I S I J A / *E X P E R T C O M M I T T E E S C O N S L U S I O N S*

STK 1 – KOMPONENTE MREŽA

Predsednik komisije: dr Vladimir ŠILJKUT
Elektroprivreda Srbije AD Beograd

Za XIV Savetovanje o elektrodistributivnim mrežama u organizaciji CIRED-SRBIJA, za Stručnu komisiju 1 – *Komponente mreža* inicijalno su prijavljene teme za 24 rada, od kojih su, na osnovu dostavljenih kratkih sadržaja (rezimea), prihvaćene 22, dok su dve preusmerene na STK-3 i STK-4. U daljem postupku, autori su dostavili 21 kompletiran rad, od kojih je svaki recenziran od strane bar jednog zvaničnog recenzenta i predsednika STK. Dva rada su odbijena zbog negativnih konačnih recenzija, dok je autor jednog rada odlučio da ga sâm povuče, nakon dva ciklusa izmena koje su ocenjene kao nedovoljne.

Na osnovu preostalih, pozitivnih konačnih recenzija, STK-1 prihvatila je ukupno 18 radova, od kojih 12 pripadaju grupi referata, a preostalih šest tehničkim informacijama. Pet radova se bave nadzemnim vodovima, jedan rad uzemljivačkim sistemom podzemnih (kablovskih) vodova, pet radova razmatra problematiku u vezi sa transformatorskim stanicama, razvodnim postrojenjima i rasklopnim aparaturama, šest se odnosi na energetske transformatore i jedan na distribuiranu proizvodnju (solarne elektrane). Ovoga puta nije bilo radova koji bi za temu imali merne transformatore.



Nakon izlaganja radova doneti su sledeći zaključci:

1. Komponente za napredne elektrodistributivne mreže i inovacije u dizajnu
   - Analizirati praksu i trendove u elektrodistributivnim kompanijama u Evropi kada su u pitanju:
     - elementi visokonaponskih kola, sa naglaskom na povišenje nivoa pouzdanosti, smanjenje gubitaka i uticaja na životnu sredinu;
     - novi materijali, u cilju povišenja nivoa efikasnosti (niži gubici, manji obim potrebnog preventivnog održavanja) i produženja životnog veka.
   - Analizirati mogućnost primene novih tehnoloških rešenja u našoj distributivnoj mreži (imajući u vidu starost komponenti): primena senzora, IT tehnologija, automatskih regulatora napona.
   - Sprovesti analizu važeće regulative u oblasti distribucije električne energije a u vezi sa projektovanjem VN objekata, radi dovođenja sistema na nivo ekonomičnog i održivog dela EES-a.

EC 1 – NETWORK COMPONENTS

Chairman: Vladimir ŠILJKUT, PhD
Electric Power Industry of Serbia

For the 14th Conference on Electricity Distribution organized by CIRED-SERBIA, the Expert Committee 1 "NETWORK COMPONENTS" has accepted a total of 24 papers of which, based on the submitted brief contents (summaries), 22 were accepted, while two were redirected to EC-3 and EC-4. In the further process, the authors submitted 21 completed papers, each of which was reviewed by at least one official reviewer and EC president. Two papers were rejected due to negative final reviews, while the author of one paper decided to withdraw it himself, after two rounds of revisions that were deemed insufficient.

Based on the remaining, positive final reviews, EC-1 accepted a total of 18 papers, 12 of which belong to the group of reports, and the remaining six to technical information. Five papers deal with overhead lines, one paper with the grounding system of underground (cable) lines, five papers consider issues related to transformer stations, switchgear and switchgear, six refer to energy transformers and one to distributed production (solar power plants). This time there were no works that had measuring transformers as their topic.

After presentations, following conclusions were made:

1. *Components for smart distribution grids and innovations in design*
   - *Analyze practices and trends in electricity distribution companies in Europe related to:*
     - *elements of high-voltage circuits, with an emphasis on increasing the level of reliability, reducing losses and environmental impact;*
     - *new materials, with the aim of increasing the level of efficiency (lower losses, smaller volume of required preventive maintenance) and extending the life span.*
   - *Analyze the possibility of applying new technological solutions in our distribution network (taking into account the age of the components): application of sensors, IT technologies, automatic voltage regulators.*
   - *Conduct an analysis of the current regulations in the area of electricity distribution and in connection with the design of HV facilities, in order to bring the system to the level of the economic and sustainable part of the Electric Power System (EPS).*

2. Pouzdanost, dijagnostika i strategija održavanja komponenti mreža
   - Analizirati praksu i trendove u elektrodistributivnim kompanijama u Evropi kada su u pitanju:
     - kriterijumi za ocenu stanja opreme;
     - merne metode i ispitivanja radi utvrđivanja stanja opreme;
     - strategija i obim sprovođenja preventivnog održavanja komponenti sistema.
   - Detaljno analizirati:
     - mehanizme starenja VN komponenti distributivne mreže i izvršiti njihovo modelovanje, radi preciznog planiranja sprovođenja ispitivanja i preventivnih aktivnosti održavanja;
     - stanje sistema i utvrditi redosled sprovođenja revitalizacije ključnih komponenti.

3. Modelovanje komponenti i primena savremenih softverskih alata
   - Analizirati praksu i trendove u elektrodistributivnim kompanijama u Evropi kada su u pitanju:
     - digitalni blizanci za različite komponente mreže;
     - razvoj digitalnih blizanaca za simulaciju ekstremnih uslova rada i predikciju kvarova.
   - Formirati:
     - modele VN komponenti sistema uzimajući u obzir konkretne uslove eksploatacije;
     - modele koji će omogućiti dinamičku analizu stanja opreme i dinamičko planiranje preventivnog održavanja;
     - baze sa stvarnim eksploatacionim podacima i modelima radi brze i efikasne procene stanja elemenata mreže.

4. *Uticaj komponenti elektrodistributivnih mreža*
   - Analizirati praksu i trendove u elektrodistributivnim kompanijama u Evropi kada su u pitanju:
     - različite strategije za smanjenje vizuelnog uticaja elektrodistributivnih komponenti;
     - metode za dizajn mrežnih komponenti koje omogućavaju lakšu reciklažu i ponovnu upotrebu materijala nakon završetka veka eksploatacije;
     - strategije za smanjenje upotrebe opasnih materija u komponentama elektrodistributivnih mreža i upravljanje njima, uz poštovanje zakonskih i ekoloških standarda.
   - Analizirati:
     - uticaj rada elektrodistributivnih sistema na životnu sredinu, posebno na emisiju ugljen-dioksida i globalno zagrevanje;
     - izvore buke i predložiti mere za smanjenje buke koja potiče od energetskih transformatora.
   - Usvojiti:
     - mere za smanjenje negativnih uticaja elektrodistributivnih sistema kroz optimizaciju dizajna i implementaciju rešenja koja smanjuju energetske gubitke i emisiju ugljen-dioksida i globalno zagrevanje;
     - planove za merenje i kontrolu nivoa elektromagnetskog zračenja.

2. *Component's reliability, diagnostics and maintenance strategy*
   - *Analyze practices and trends in electricity distribution companies in Europe related to:*
     - *criteria for evaluating the state of equipment;*
     - *measuring methods and tests for determining the condition of the equipment (condition monitoring techniques);*
     - *strategy and scope of implementation of preventive maintenance of system components*
   - *Analyze in detail:*
     - *aging mechanisms of HV components of the distribution network and perform their modeling, for the purpose of precise planning of testing and preventive maintenance activities;*
     - *the condition of the system and set up the implementation stages for key components revitalization.*

3. *Components modeling and application of modern software tools*
   - *Analyze practices and trends in electricity distribution companies in Europe related to:*
     - *digital twins for different network components;*
     - *development of digital twins for simulation of extreme operating conditions and failure prediction.*
   - *Form:*
     - *models of HV system components, taking into account specific operating conditions;*
     - *models that will enable dynamic analysis of equipment condition and dynamic planning of preventive maintenance;*
     - *databases with real operational data and models for quick and efficient assessment of the condition of network elements.*

4. *The impact of network components*
   - *Analyze practices and trends in electricity distribution companies in Europe related to:*
     - *different strategies for reducing the visual impact of electrical distribution components;*
     - *methods for the design of network components that enable easier recycling and reuse of materials after the end of their lifetime;*
     - *strategies for reducing the use of hazardous substances in network components networks and their management, in compliance with the legal and environmental standards.*
   - *Analyze:*
     - *environmental impact of electricity distribution systems, especially on carbon dioxide emissions and global warming;*
     - *sources of noise and propose measures for reducing noise caused by power transformers.*
   - *Adopt:*
     - *measures for reducing the negative impacts of electrical distribution systems through design optimization and implementation of solutions for reducing energy losses and carbon dioxide emissions and global warming;*
     - *plans for measuring and controlling the level of electromagnetic radiation.*

Najzapaženiji rad / *The most prominent paper*:

R-1.12.

PRORACUN MINIMALNOG POPRECNOG PRESEKA PARALELNOG PROVODNIKA UZEMLJENJA ZA PODZEMNE ENERGETSKE KABLOVE U TROUGAONOJ FORMACIJI SA METALNIM EKRANIMA UZEMLJENIM NA JEDNOM KRAJU

CALCULATING MINIMUM CROSS-SECTIONAL AREA OF THE PARALLEL-EARTHING-CONDUCTOR FOR UNDERGROUND POWER CABLES IN TREFOIL FORMATION WITH METALLIC SCREENS BONDED AND EARTHED AT ONE END

Autori / *Authors*: Marko ŠUĆUROVIĆ, Dardan KLIMENTA, Dragan TASIĆ

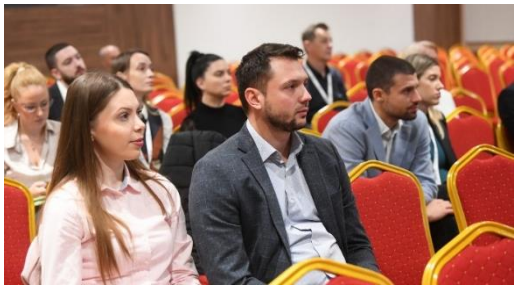
Nagrada za tehničku inovaciju / *Technical innovation award:*

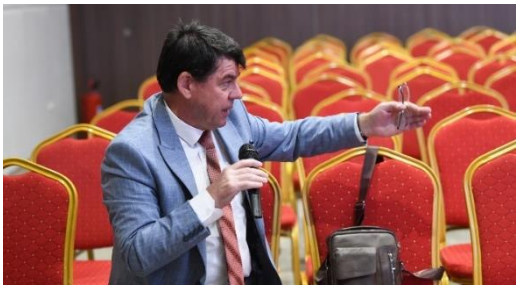
R-1.07.

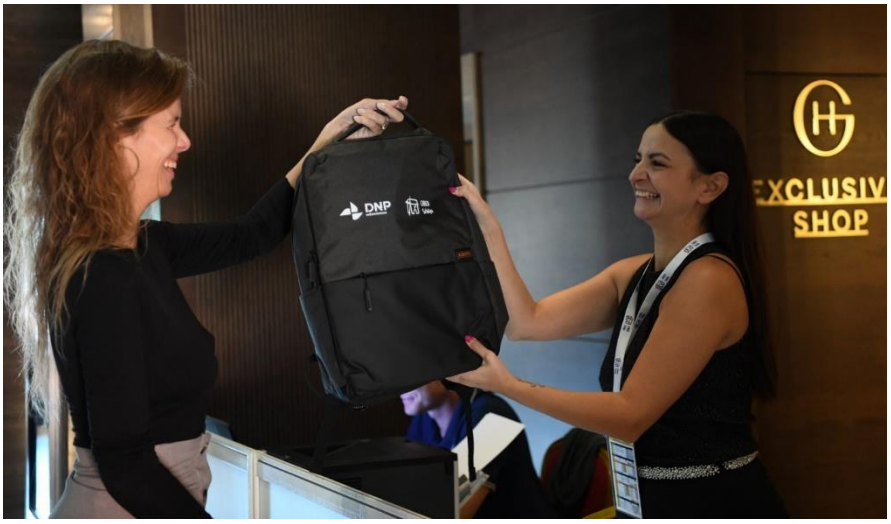
POSTUPAK ZA UKLANJANJE ELEMENTARNOG SUMPORA IZ ULJA ENERGETSKIH TRANSFORMATORA – SMANJENJE RIZIKA OD HAVARIJA ENERGETSKIH TRANSFORMATORA

PROCEDURE FOR REMOVING ELEMENTAL SULFUR FROM THE OIL OF POWER TRANSFORMERS - REDUCING THE RISK OF POWER TRANSFORMERS FAILURES

Autori / *Authors*: Dejan Kolarski, Valentina Vasović, Jelena Janković, Draginja Mihajlović, Jovana Bošnjaković





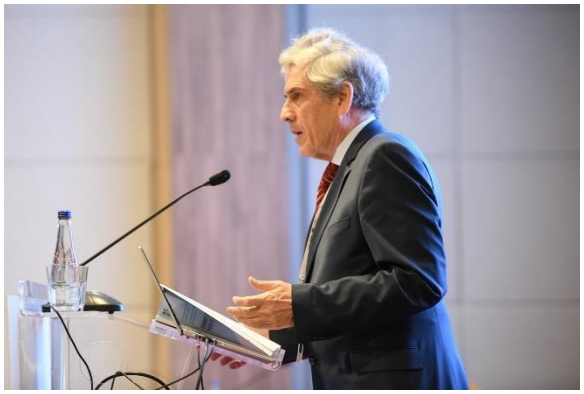


STK 2 - KVALITET ELEKTRIČNE ENERGIJE U ELEKTRODISTRIBUTIVNIM SISTEMIMA

Predsednik: Prof. dr Vladimir KATIĆ
Fakultet tehničkih nauka Univerziteta u Novom Sadu

Za izlaganje na XIV savetovanju u sklopu tematike STK 2 prijavljeno je devet radova u vidu abstrakata, ali je u punom obliku dostavljeno sedam. Svi dostavljeni radovi recenzirani su od strane kompetentnih recenzenata, a nakon recenzije, urađenih ispravki od strane autora i diskusije na stručnoj komisiji, za izlaganje prihvaćeno je šest radova kao referati i jedan kao informacija. Stručna komisija svrstala je radove po preferencijalnim temama i to četiri rada u prvu, dva u drugu i jedan u četvrtu preferencijalnu temu.

Nakon toga, stručni izvestilac je pripremio izveštaj i postavio odgovarajuća pitanja za diskusiju. Za izveštaj je koristio zapažanja, komentare i pitanja recenzenata, na čemu im je posebno zahvalio.



U program savetovanja uvršteno je svih sedam recenziranih i kompletno dostavljenih radova, kao šest referata i jedna informacija. Na dve sesije u četvrtak, 19.09.2024. od 9:00h do 12:00h, kojima su predsedavali prof. dr Vladimir Katić i dr Velimir Strugar, referisani su svi radovi i prodiskutovani na bazi pitanja stručnog izvestioca i prisutnih u sali. Diskusija je bila veoma plodna i veliki deo učesnika je postavljao pitanja ili komentarisao radove. Prisustvo je bilo veoma dobro i kretalo se između 30 i 50 učesnika.

STK 2 je u produžetku svoje druge sesije, na posebnom sastanku, razmotrio doprinose svih radova i glasanjem prisutnih odlučio o najzapaženijem radu. Za glasanje su izdvojena, odnosno predložena tri rada, a najviše glasova (natpolovičnu većinu), dobio je rad pod brojem R-2.05 autora Nikole Laketića, V. Đikića, V. Krnajskog i A. Tatalovića pod nazivom "Metoda za estimaciju uticaja priključenja novih potrošača na vrednost flikera u distributivnoj mreži". Na svečanoj večeri CIRED-a, prvom autoru je predsednik STK 2, prof. dr Vladimir Katić uz prisustvo predsednika CIRED Srbije dr Zorana Simendića uručio prigodnu plaketu.

Ukupan utisak je da je rad STK 2, kao i kompletno savetovanje, bio uspešan, da je protekao u konstruktivnoj atmosferi, da je prezentovano niz interesantnih radova i stručnih saopštenja, kao i da je organizacija bila na najvišem nivou.

EC 2 - POWER QUALITY IN POWER DISTRIBUTION SYSTEMS

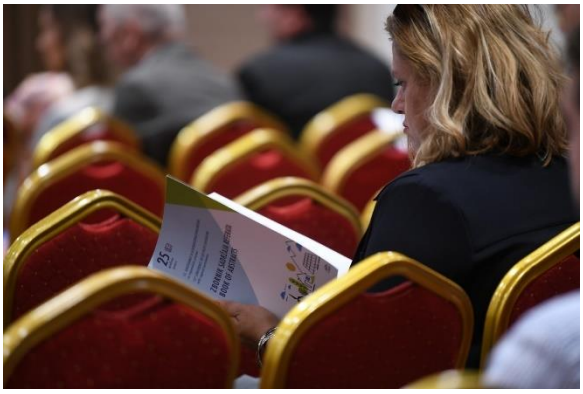
Chairman: Prof. Vladimir KATIĆ, PhD
Faculty of Technical Sciences, University of Novi Sad

Nine papers were submitted in the form of abstracts to be presented at the XIV Conference as part of EC 2, but seven were submitted in full form. All submitted papers were reviewed by competent reviewers, and after the review, corrections made by the authors, and discussion at the expert committee, six papers were accepted for presentation as papers and one as information. The expert committee classified the papers according to preferential topics, namely four papers in the first, two in the second, and one in the fourth preferential topic. After that, the expert rapporteur prepared a report and stated appropriate questions for the discussion. He used the reviewers' observations, comments, and questions for the report, for which he especially thanked them.

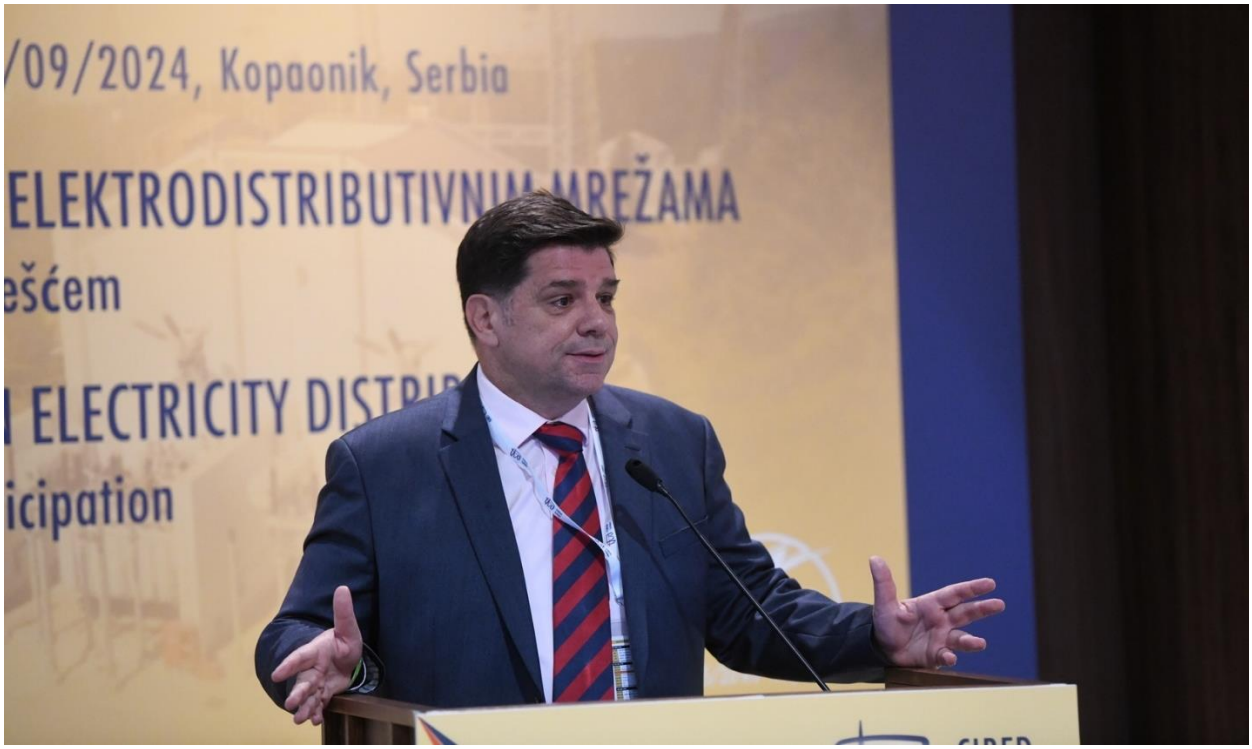
All seven peer-reviewed and completely submitted works, as six papers and one information, were included in the conference program. In two sessions on Thursday, September 19, 2024. from 9:00 a.m. to 12:00 p.m., chaired by prof. Dr. Vladimir Katić and Dr. Velimir Strugar, all papers were presented and discussed based on the questions of the expert reporter and those present in the hall. The discussion was very fruitful and a large part of the participants asked questions or commented on the papers. The attendance was very good and ranged between 30 and 50 participants.

EC 2, in the extension of its second session, at a special meeting, considered the contributions of all papers and decided on the best paper by voting. Three papers were selected and proposed for the voting, and the paper numbered R-2.05 by Nikola Laketić, V. Đikić, V. Krnajski, and A. Tatalović, entitled "Method for estimating the impact of connecting new consumer on the value of flicker in the distribution network" received the highest number of votes (over half majority). At the formal dinner of CIRED, the first author was presented with the appropriate plaque and handed over by the president of EC 2, Prof. Dr. Vladimir Katic, in the presence of the president of CIRED Serbia, Dr. Zoran Simendić.

The overall impression is that the work of the EC 2, as well as the entire conference, was successful, that it took place in a constructive atmosphere, that many interesting papers and professional announcements were presented, and that the organization was at the highest level.



Najzapaženiji rad / *The most prominent paper:*

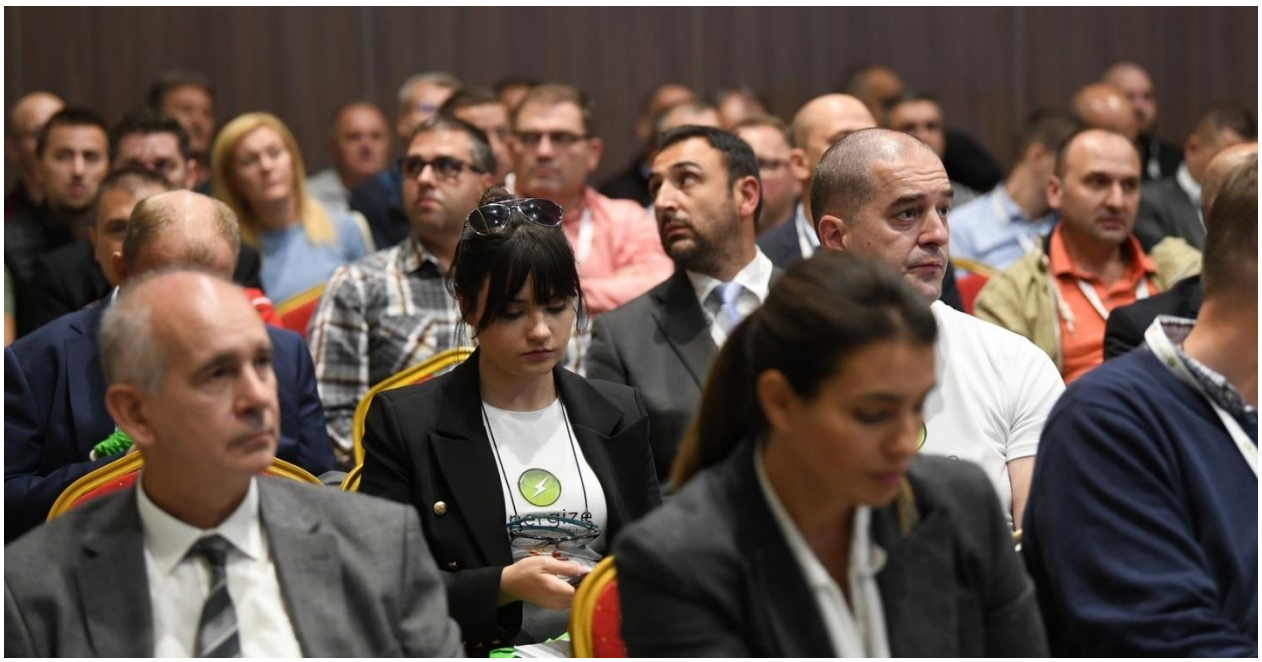


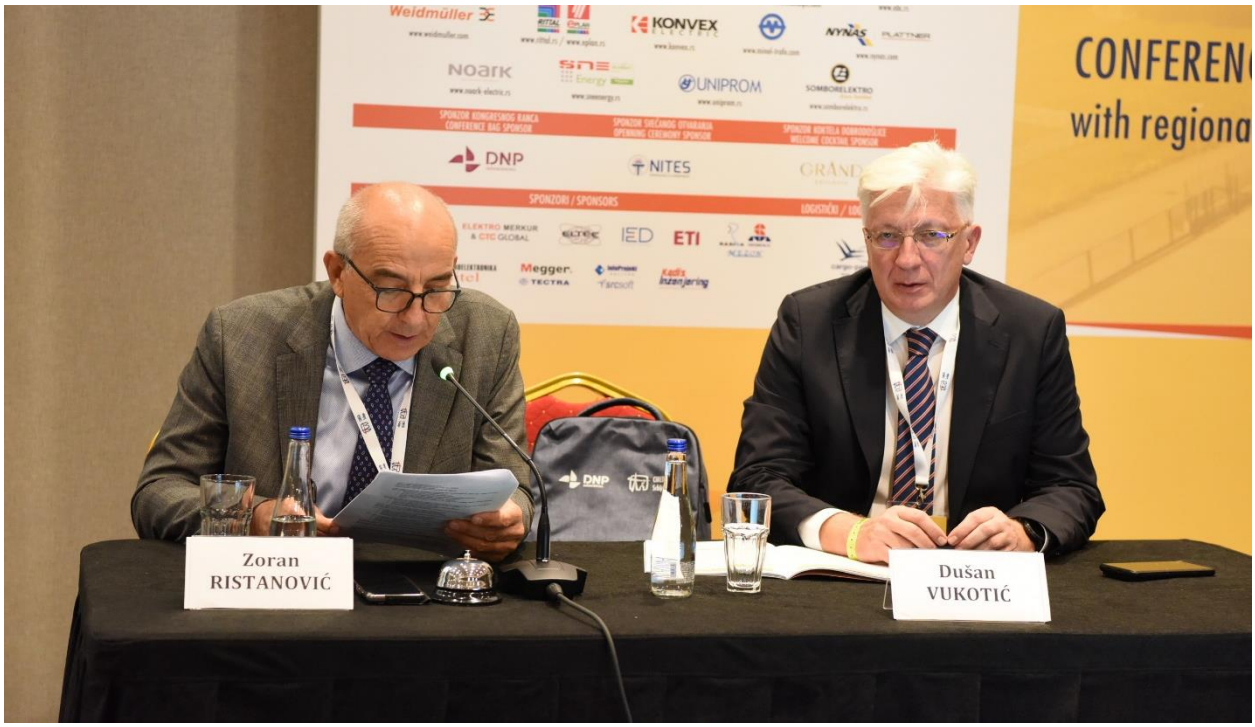
R-2.05

METODA ZA ESTIMACIJU UTICAJA PRIKLJUČENJA NOVIH POTROŠAČA NA VREDNOST FLIKERA U DISTRIBUTIVNOJ MREŽI

A METHOD FOR ESTIMATING THE INFLUENCE OF NEW LOADS TO FLICKER VALUES IN DISTRIBUTION GRID

Autori / *Authors*: Nikola LAKETIĆ, Vladimir ĐIKIĆ, Vladimir KRNAJSKI, Aleksandar TATALOVIĆ





STK 3 - ZAŠTITA I UPRAVLJANJE ELEKTRODISTRIBUTIVNIM MREŽAMA

Predsednik komisije: mr Dušan Vukotić
Elektrodistribucija Srbije d.o.o. Beograd

U okviru stručne tehničke komisije STK-3 prezentovano je ukupno 15 (petnaest) radova i informacija, od ukupno 17 (sedamnaest) referata, koji su uvršćeni u program ovogodišnjeg Savetovanja.

Nakon prezentacije radova i informacija u okviru rada stručne komisije, kroz četiri tematske celine doneseni su sledeći zaključci prema prezentovanim temama iz oblasti zaštite i upravljanja u elektrodistributivnim mrežama:

1. Prezentovana su najnovija tehnička rešenja napredne automatizacije SNDM mreže koja trasiraju put ka novoj koncepciji automatizacije SNDM mreže, čime je napravljen značajan tehnološki zaokret u odnosu na postojeću koncepciju koja je usvojena pre više od dvadeset godina. Takođe, nova rešenja automatizacije SNDM mreže donose i potrebu da izvršioci u okviru elektrodistributivnih preduzeća podignu svoj nivo znanja i kompetencija kroz rad na savremenim simulatorima rada elektrodistributivne mreže. Razvoj takvih složenih laboratorija sa implementiranim simulatorima rada elektrodistributivne SN i NN mreže sam po sebi predstavlja veliki izazov. Primena najnovijih tehničkih rešenja koja treba da omoguće efikasnu integraciju distribuirane proizvodnje, ali i drugih značajno unapređenih komponenti sistema, sačinjavaju izuzetno složen elektrodistributivni sistem koji je potrebno simulirati u očekivanim slučajevima u proširenom realnom vremenu.

EC 3 – PROTECTION AND CONTROL IN DISTRIBUTION NETWORKS

Chairman: Dušan Vukotić, M.Sc.
Electric Power Distribution of Serbia, Belgrade

A total of 15 (fifteen) papers and information, out of a total of 17 (seventeen) reports, were presented within the EC-3 expert technical committee, which were included in the programme of this year's Conference

After the presentation of works and information within the work of the expert commission, through four thematic units the following conclusions were reached according to the presented topics in the field of protection and management in electrical distribution networks:

1. *The latest technical solutions of advanced MVDN network automation were presented, which pave the way to a new concept of MVDN network automation, which made a significant technological turn compared to the existing concept adopted more than twenty years ago. Also, the new automation solutions of the MVDN network bring the need for the operators within the power distribution companies to raise their level of knowledge and competence through work on modern simulators of the power distribution network. The development of such complex laboratories with implemented simulators of the electric distribution MV and LV network is in itself a big challenge. The application of the latest technical solutions that should enable efficient integration of distributed production, as well as other significantly improved system components, make up an extremely complex electrical distribution system that needs to be simulated in expected cases in extended real time.*

2. Najsavremenija koncepcija integrisanih sistema zaštite i upravljanja u okviru elektroenergetskih objekata trasira put ka primeni potpune digitalizacije. Rezultati primene koncepcija digitalizacije kroz primenu „procesne sabirnice“ u okviru pojedinih transformatorskih stanica na prenosnom nivou energetskog sistema, ukazuju da će se proces digitalizacije proširiti i na distributivne elektroenergetske objekte. Prezentovani radovi iz oblasti zaštite su ukazivali na neophodnost što skorije primene takvih rešenja i u okviru napojnih distributivnih transformatorskih stanice koje su po svojoj koncepciji sve složenije i imaju veliki broj inteligentnih elektronskih uređaja koji međusobno komuniciraju u integrisanom sistemu zaštite i upravljanja putem najsavremenijih protokola. Realno je očekivati da će proces digitalizacije elektroenergetskih objekata uzeti maha, budući da postoji potreba u bliskoj budućnosti da se gradi ili rekonstruiše veliki broj elektroenergetskih objekata sa relativno malim broj visoko obučenih stručnjaka iz ove oblasti. Takođe, pojedini radovi su ukazivali i na potrebu korišćenja najnovijih alata i tehnika koji omogućavaju formiranje digitalnih modela uređaja na određenim softverskim platformama, na kojima je moguće simuliranje rada konfigurisanih uređaja zaštite i upravljanja pre nego se konfiguracije primene na ugrađenim mikroprocesorskim uređajima u elektroenergetskim objektima.

3. Sve intezivniija integracija distribuirane proizvodnje praktično na svim naponskim nivoima elektrodistributivne mreže donosi sa sobom potrebu da se proizvodnim jedinicama upravlja u okviru budućeg tržišta pomoćnih usluga, pružanja sistemskih usluga ili pružanja usluga balansiranja. Nove nadležnosti koje će imati operatori sistema donose sa sobom i potrebu da operatori efikasno razmenjuju procesne informacije, ali i da upravljaju proizvodnim jedinicama u smislu otklanjanja zagušenjima, bilo da se ona javljaju na prenosnom ili distributivnom nivou. Integrisani sistemi zaštite i upravljanja koji su realizovani na nivou transformatorskih stanica biće spregnuti sa sistemima zaštite i upravljanja u objektima za proizvodnju električne energije, ali i u objektima za skladištenje električne energije. Zahtevi koji se postavljaju pred koordinaciju zaštite između elektroenergetskih objekata postaju sve složeniji i takvi zahtevi neće mogu da se reše bez primene savremenih alata za simulaciju rada zaštite. Iz tih razloga stručno osoblje koje se bavi poslovima zaštite i upravljanja mora biti obučeno za korišćenje najnovijih alata za mrežne proračune i simulaciju koordinacije rada zaštitnih uređaja.

2. *The state-of-the-art concept of integrated protection and control systems within power facilities traces the path to the implementation of complete digitization. The results of the application of digitalization concepts through the application of the "process bus" within individual substations at the transmission level of the energy system indicate that the digitalization process will also be extended to distribution power facilities. The presented papers in the field of protection indicated the necessity of implementing such solutions as soon as possible within the power distribution substations, which are increasingly complex in their conception and have a large number of smart electronic devices that mutually communicate in an integrated system of protection and control through the state-of-the-art protocols. It is realistic to expect that the process of digitization of power facilities will take off, since there is a need in the near future to build or reconstruct a large number of power facilities with a relatively small number of highly trained experts in this field. Also, some papers indicated the need to use the latest tools and techniques that enable the formation of digital models of devices on certain software platforms, on which it is possible to simulate the operation of configured protection and control devices before the configurations are applied to embedded microprocessor devices in power facilities.*

3. *The increasingly intensive integration of distributed production practically at all voltage levels of the electrical distribution network brings with it the need to manage production units within the future market of auxiliary services, provision of system services or provision of balancing services. The new responsibilities that system operators will have bring with them the need for operators to efficiently exchange process information, but also to manage production units in terms of eliminating congestion, whether it occurs at the transmission or distribution level. Integrated protection and control systems implemented at the level of substations will be coupled with protection and control systems in facilities for the production of electricity, but also in facilities for storage of electricity. The requests placed on the coordination of protection between power facilities are becoming more and more complex, and such requests cannot be solved without the application of modern tools for simulating the operation of protection. For these reasons, professional personnel dealing with protection and control must be trained in the use of the latest tools for network estimates and simulation of coordination of protective devices operation.*

4. Konstatuje se nedovoljan broj referata iz oblasti održavanja i eksploatacije elektrodistributivne mreže, što nedvosmisleno ukazuje na nedostatak broj stručnjaka koji se bave ovom važnom problematikom. Iako je elektrodistributivni sistem u celini suočen sa velikim broj kvarova, pre svega iz razloga već dugog eksploatacionog veka komponenti postrojenja, pre svega transformatora snage, prekidača i ostale rasklopne opreme, stručnjaci iz ove oblasti ne nalaze za shodno da širu stručnoj javnosti približe problema sa kojima se suočavaju u svakodnevnom radu. Savremena rešenja iz ove oblasti ukazuju na potrebu preventivnih aktivnosti održavanja elektrodistributivne mreže i elemenata, čime se značajno povećava pouzdanost rada elektrodistributivnog sistema u celini. Nažalost, fokus naših stručnjaka je usmeren pre svega na korektivnim aktivnostima, što neće dati zadovoljavajuće rezultate u očuvanju pogonske spremnosti u bliskoj budućnosti. Veliki broj slučajeva sa kvarovima sa kojima se stručnjaci iz ove oblasti svakodnevno suočavaju u praksi i načine na koji se oni pristupili rešavanju problema, svakako bi bilo dobro da se prezentuju kroz referate na sledećem Savetovanju, što bi svakako doprinelo neophodnoj razmeni iskustva i primeni najbolje prakse u cilju rešavanja problema.

5. Prezentovana su rešenja koja se odnose na prikupljanje prostornih podataka o nadzemnim vodovima, čije prikupljanje i obrađivanje u značajnoj meri olakšava praćenje stanja vodova nadzemne mreže, kao i praćenje vegetacije u neposrednoj blizini koridora vodova nadzemne mreže, a u cilju smanjenja ispada usled nevremena i olujnih vetrova. Tehnologija u ovoj oblasti je značajno unapređena i omogućava obradu velikog broja podataka sa tačnom identifikacijom mogućih uzroka eventualnih ispada, a sve u cilju da se preventivno deluje na postojeće stanje vodova nadzemne mreže i neposredne okoline. Tehnološka rešenja se sve više oslanjaju na primenu veštačke inteligencija, koja treba da nadomesti nedostatak stručnog kadra koji bi se bavio obradom velikog broja podataka, bilo da se radi o prostornim ili tehničkim podacima. U praksi se već primenjuju rešenja digitalnih prostornih modela okoline i mreže, koja su od parcijalnih rešenja koridora vodova doživela ekspanziju na čitavim područjima. Prostorni digitalni modeli predstavljaju poslednju tehnološku instancu u razvoju geografskih informacionih sistema, oko kojih trebaju da se realizuju sve buduće platforme i sistemi koji bi se integralno bavili analizom stanja elektroenergetskih objekata i elemenata.

4. *There is an insufficient number of reports in the field of maintenance and exploitation of the electrical distribution network, which unambiguously indicates the lack of experts dealing with this important issue. Although the electrical distribution system as a whole is faced with a large number of failures, primarily due to the already long operational life of plant components, especially power transformers, circuit breakers and other switching equipment, experts in this field do not find it appropriate to bring the problems they are facing in everyday work closer to the wider professional public. Modern solutions from this area indicate the need for preventive maintenance activities of the electrical distribution network and elements, which significantly increases the reliability of the electrical distribution system as a whole. Unfortunately, the focus of our experts is primarily on corrective activities, which will not yield satisfactory results in preserving operational readiness in the near future. A large number of cases with malfunctions that experts in this field face daily in practice and the ways in which they have poceeded in solving the problems are very important and they could certainly be covered through reports at the next Conference, which would certainly contribute to the necessary exchange of experience and the application of best practices in order to solve the problems.*

5. *Solutions related to the collection of spatial data on overhead lines are presented, the collection and processing of which significantly facilitates the monitoring of the condition of the overhead network lines, as well as the monitoring of vegetation in the immediate vicinity of the corridor of the overhead network lines, with the aim of reducing outages due to bad weather and gale force winds. The technology in this area has been significantly improved and enables the processing of a large amount of data with the exact identification of possible causes of outages, all with the aim of preventively acting on the existing condition of the overhead network lines and the immediate environment. Technological solutions increasingly rely on the application of artificial intelligence, which should compensate for the lack of professional staff who would deal with the processing of a large amount of data, be it spatial or technical data. Solutions of digital spatial models of the environment and network are already being applied in practice, which have expanded from partial solutions of conduit corridors in entire areas. Spatial digital models represent the last technological instance in the development of geographic information systems, around which all future platforms and systems should be implemented that would be integrally involved in the analysis of the state of power facilities and elements.*

6. Nagli razvoj telekomunikacionih sistema i servisa u okviru elektrodistributivnih sistema u poslednjoj deceniji trasirao je put ka sveobuhvatnoj realizaciji inteligentnih mreža. Od posebnog interesa su radio-sistemi koji pokrivaju velika područja i koja omogućavaju integraciju velikog broj elemenata za automatizaciju SNDM mreže u Sistem daljinskog upravljanja (SDU) operatora distributivnog sistema na određenom konzumnom području. Dosadašnja rešenja su se prvenstveno bazirala na primeni različitih digitalnih radio-sistema paketnog prenosa namenjenog za rad u okviru elektrodistributivnih sistema, koja često nisu bila integrabilna budući da rade na različitim frekvencijskim opsezima u licenciranom opsegu. Neophodno je pristupiti analizi rada realizovanih radio-sistema kod operatora distributivnog sistema u cilju optimizacije rada, budući da na pojedinim konzumnim područjima imamo preplitanje realizovanih radio-sistema koji međusobno utiču na rad. Imajući u vidu predstojeću intenzivnu automatizaciju SNDM mreže, optimizaciji rada realizovanih radio-sistem treba dati prioritet, budući da će u okviru postojećih sistema biti integrisan veliki broj novih elemenata za automatizaciju SNDM mreže.

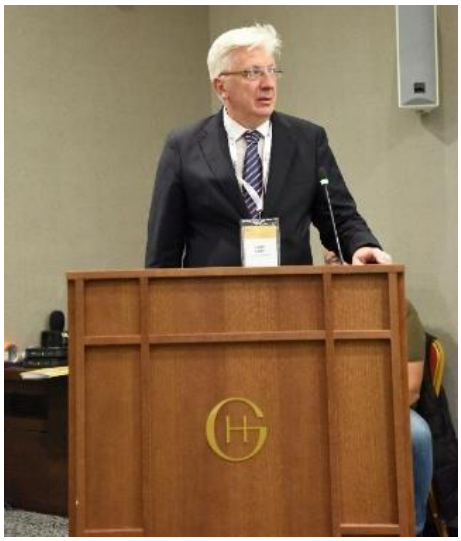
7. U poslednje vreme „cyber" bezbednost operativnih i tehničkih sistema u okviru informaciono-telekomunikacione infrastrukture operatora distributivnog sistema dobija na posebnom značaju, jer je ona bila predmet velikog „cyber" napada koji je prouzrokovao veliku štetu. Posledice takvih napada na infrastrukturu operatora distributivnog sistema su velike i zahtevaju dosta vremena da se one eliminišu. Odbrana takvih sistema počiva na složenim realizovanim sistemima kojim upravljaju stručnjaci iz te oblasti, koji su kod operatora distributivnog sistema u deficitu. Generalno, stručnjaci koji se bave ovom oblašću su deficitarni na svim nivoima zaštite u jednoj državi, a zahtevaju permanentno usavršavanje, jer se mehanizmi i načini napada na kritičnu infrastrukturu stalno menjaju i unapređuju. Budući da su napadi često koordinirani i skoncentrisani su na kritičnu infrastrukturu koja je značajna za funkcionisanje države, nameće se potreba veće koordinacije između korisnika kritične infrastrukture Sa druge strane, neprestano unapređenje sistema zaštite IKT infrastrukture operatora distributivnog sistema zahteva značajna finansijska sredstva, budući da treba da se obezbedi efikasna zaštita praktično na svim tehnološkim nivoima elektroenergetskih objekata i elemenata. Praksa je pokazala da najnovija tehnološka rešenja koja se primenjuju ili planiraju da se uvedu u okviru elektrodistributivnog sistema su bezbednosno osetljiva i da prilikom uvođenja najnovijih tehnoloških rešenja treba povesti računa da se takva rešenja štite na adekvatan način.

8. Budući da su već doneseni zaključci sa prethodnih Savetovanja, koji su se odnosili na potrebu donošenja nove tehničke regulative, bilo kroz donošenje generalnih granskih standarda u okviru elektrodistributivne delatnosti ili internih standarda u okviru elektrodistributivnih preduzeća, opšti donesen zaključak i sa ovog Savetovanja ukazuje na neophodnost njihovog donošenja imajući u vidu najnovija tehnološka rešenja koja se primenjuju u elektrodistributivnim mrežama, ali i integraciju daleko većeg broja novih učesnika u proces širenja elektrodistributivne delatnosti.

6. *The rapid development of telecommunication systems and services within electrical distribution systems in the last decade paved the way for the comprehensive realization of smart networks. Of special interest are the radio systems that cover large areas and that enable the integration of a large number of elements for the automation of the MVDN network into the Remote Control System (RCS) of the distribution system operator in a certain consumption area. Previous solutions were primarily based on the application of different digital packet transmission radio systems intended for operation within electrical distribution systems, which were often not integrable since they operate on different frequency bands in the licensed range. It is necessary to make an analysis of the operation of the implemented radio systems with the distribution system operator in order to optimize the work, since we have in certain consumption areas an intertwining of the implemented radio systems that mutually affect operation. Bearing in mind the upcoming intensive automation of the MVDN network, the optimization of the work of the implemented radio system should be given priority, since a large number of new elements for the automation of the MVDN network will be integrated within the existing systems.*

7. *Recently, "cyber" security of operational and technical systems within the information and telecommunication infrastructure of the distribution system operator has gained special importance, because it was the subject of a large "cyber" attack that caused great damage. The consequences of such attacks on the infrastructure of the distribution system operator are great and require a lot of time to eliminate them. The defense of such systems rests on complex implemented systems managed by experts in this field, which the distribution system operator lacks. In general, experts who deal with this field are in short supply at all levels of protection in a country, and they require permanent training, because the mechanisms and methods of attacks on critical infrastructure are constantly changing and improving. Since attacks are often coordinated and are concentrated on critical infrastructure that is important for the functioning of the state, there is a need for greater coordination between the users of critical infrastructure. On the other hand, continuous improvement of the ICT infrastructure protection system of distribution system operators requires significant financial resources, since effective protection is ensured practically at all technological levels of power facilities and elements. Practice has shown that the latest technological solutions that are implemented or planned to be introduced within the electricity distribution system are security sensitive and that when introducing the latest technological solutions, care should be taken to protect such solutions in an adequate manner.*

8. *Since the conclusions from the previous Conferences, relating to the need of adopting new technical regulations, have already been reached, either through the adoption of general branch standards within the power distribution industry or internal standards within the power distribution companies, the general conclusion reached from this Conference also indicates the necessity of their adoption, bearing in mind the latest technological solutions that are applied in power distribution networks, but also the integration of a far greater number of new participants in the process of expanding the power distribution activity.*



Najzapaženiji rad / *The most prominent paper*:

R-3.01

UPOREDNA ANALIZA PRIMENJENIH REŠENJA NAPREDNE AUTOMATIZACIJE SNDM MREŽE

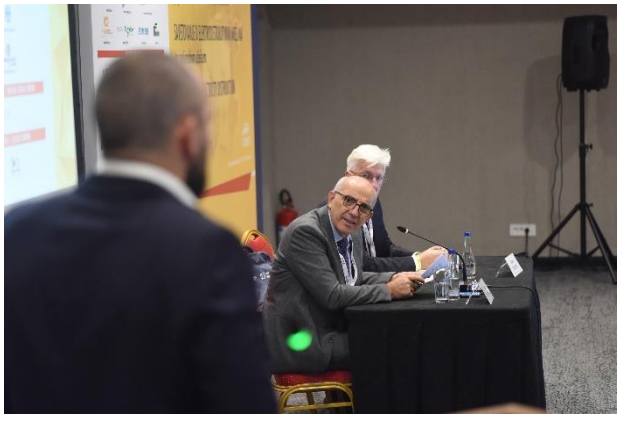
COMPARATIVE ANALYSIS OF APPLIED SOLUTIONS OF ADVANCED AUTOMATION OF THE MV ELECTRIC DISTRIBUTION NETWORK

Autori / *Authors*: Dušan VUKOTIĆ, Stojan ŠIŠKOSKI, Božidar ĆIRIĆ

Obrazloženje: Predloženi referat je u okviru STK izabran većinom glasova kao najzapaženiji referat iz razloga što je za predmet rada imao primenjena rešenja napredne automatizacije SNDM mreže na konzumnom području grada Beograda. U okviru rada je izvršena analiza rada oba primenjena rešenja napredne automatizacije SNDM mreže na osnovu realnih situacija u elektrodistributivnoj mreži, pri čemu je detaljno opisan način na koji su primenjena rešenja izvršila automatsku restauraciju napajanja krajnjih korisnika koji su pogođeni kvarom. Pokazano je da su realizovana rešenja napredne automatizacije SNDM mreže u raznim situacijama uspešno sprovele postupak automatske restauracije napajanja električnom energijom krajnjim korisnicima u okviru postavljenog cilja od 30 sekundi. Imajući u vidu broj obuhvaćenih krajnjih korisnika sa oba primenjena rešenja napredne automatizacije SNMD mreže, koja su u ovom trenutku jedna od najvećih u svetu, početni rezultati njihove primene trasiraju put ka novom savremenom konceptu automatizacije SNDM mreže.

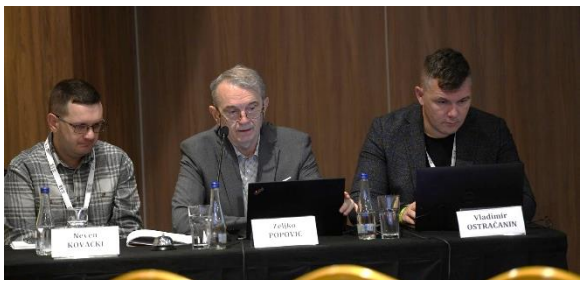
Explanation: The proposed paper was chosen by the majority of votes as the most notable paper within the EC, due to the fact that the subject of the work dealt with the applied solutions for the advanced automation of the MVDN network in the consumer area of the city of Belgrade. As part of the paper, an analysis of the functioning of both applied solutions of advanced automation of the MVDN network was performed based on real situations in the power distribution network, while the way in which the applied solutions performed the automatic restoration of the power supply of the end users affected by the failure was described in detail. It was shown that the realized solutions of advanced automation of the MVDN network in various situations had successfully implemented the procedure of automatic restoration of electricity supply to the end users within the set goal of 30 seconds. Bearing in mind the number of covered end users with both applied solutions of advanced MVDN network automation, which are currently among the largest in the world, the initial results of their application trace the path to a new modern concept of MVDN network automation.




STK 4 - DISTIBUIRANA PROIZVODNJA I EFIKASNO KORIŠĆENJE ELEKTRIČNE ENERGIJE

Predsednik komisije: dr Željko POPOVIĆ
Fakultet tehničkih nauka, Novi Sad



Nakon prezentacije radova na Savetovanju doneti su sledeći zaključci:

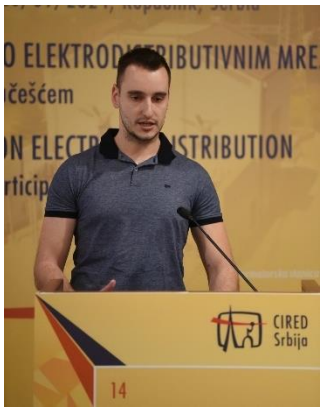
1. Intenzivirati istraživanja kratkoročnih i dugoročnih uticaja obnovljivih izvora (generatora, skladišta, upravljanja potrošnjom, i sl.), na sve poslovne procese u distributivnom sistemu Srbije uz uvažavanje neizvesnosti i varijabilnosti u proizvodnji i potrošnji električne energije. U tom cilju angažovati na organizovan i sistemski način sve resurse u Srbiji – fakultete i institute, predstavnike regulatornih i zakonodavnih tela, agregatore, kao i ostale zaintresovane strane radi dobijanja jasnog plana (ili skupa planova) kojima se definišu potrebne promene kako u poslovnim procesima ODS-a tako i u ostalim oblastima u cilju minimizacije rizika od mogućih negativnih efekata/posledica.
2. Intenzivirati proučavanje mogućih uticaja različitih nivoa peneteracije fotonaponskih generatora i električnih vozila (punionica) u reprezentnim niskonaponskim mrežama u Srbiji. Na osnovu toga sagledati (preporučiti) mere, sa stanovišta tehničkih rešenja kao i sa stanovišta legislative, koje se trebaju preduzeti da bi se smanjili rizici od potencijalnih negativnih/neželjenih efekata.
3. Unaprediti istraživanja iz oblasti upravljanja opterećenjem kao resursa kojim se mogu značajno smanjiti negativni uticaji vezani za visok stepen neizvesnosti i varijabilnosti u proizvodnji obnovljivih izvora i time povećati nivo penetracije ovakvih izvora.
4. Obezbediti da svi podaci o distributivnom sistemu koji predstavljaju bazu za primenu koncepta pametnih mreža (npr. podaci o elementima sistema na svim naponskim nivoima, podaci o broju, vrsti i trajanju prekida i poravki i sl.) budu na sistemski i sistematski način prikupljani i obrađivani (npr. korišćenjem sistema za upravljanje prekidima (Outage Management System).

EC 4 - DISTRIBUTED PRODUCTION AND EFFICIENT USE OF ELECTRICITY

Chairman: Željko POPOVIĆ, PhD
Faculty of Technical Sciences, Novi Sad

After presenting the papers, the following conclusions were drawn:

1. *Intensify research into the short-term and long-term impacts of renewable sources (generators, storage, consumption management, etc.) on all business processes in the distribution system of Serbia, while respecting the uncertainty and variability in the production and consumption of electrical energy. To this end, engage in an organized and systematic manner all resources in Serbia - faculties and institutes, representatives of regulatory and legislative bodies, aggregators, as well as other stakeholders in order to obtain a clear plan (or set of plans) that define necessary changes in the business processes of DSOs - as well as in other areas in order to minimize the risk of possible negative effects/consequences.*
2. *Intensify the study of possible impacts of different levels of penetration of photovoltaic generators and electric vehicles (charging stations) in representative low-voltage networks in Serbia. Based on that, review (recommend) measures, from the aspect of technical solutions as well as from the aspect of legislation, which should be undertaken in order to reduce the risks of potential negative/side effects.*
3. *Improve research in the field of load management as a resource which can significantly reduce the negative impacts related to the high degree of uncertainty and variability in the production of renewable sources and thereby increase the penetration level of such sources.*
4. *Ensure that all data on the distribution system that represent the basis for the application of the smart grid concept (e.g., data on system elements at all voltage levels, data on the number and type and duration of outages and repairs, etc.) are systemically and systematically collected and processed (e.g. using the Outage Management System).*



Najzapaženiji rad / *The most prominent paper*:

R-4.19

IDENTIFIKACIJA FAZA I ISPADA U NN MREŽAMA ZASNOVANA NA DOGAĐAJIMA SA PODACIMA PAMETNIH BROJILA

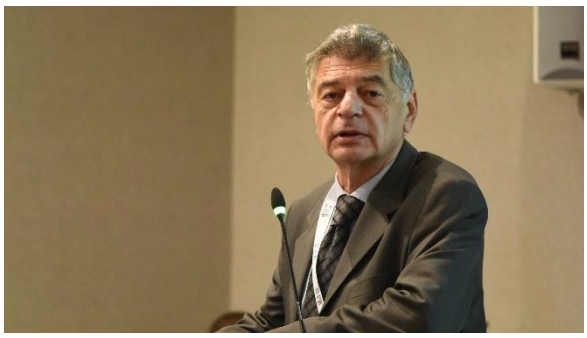
EVENT BASED IDENTIFICATION OF PHASES AND OUTAGES IN LV NETWORKS WITH SMART METER DATA

Autori / *Authors*: Danijel DAVIDOVIĆ, Dalibor CRNOJA, Sreten DAVIDOV

STK 5 - PLANIRANJE DISTRIBUTIVNIH SISTEMA

Predsednik: Prof. dr Aleksandar Janjić
GOPA - International Energy Consultants GmbH, Beograd

U okviru STK 5, u sklopu 5 preferencijalnih tema, prispelo je 14 stručnih radova koji odgovaraju karakteru skupa i preferencijalnim temama, od kojih je nakon izvršene stručne recenzije i klasifikacije 11 svrstano u referate, a 3 rada svrstano u informacije. U prispelim radovima tretirano je svih pet preferencijalnih tema u okviru kojih su razmatrane aktuelne problematike, a na koje se odgovaralo savremenim inženjerskim pristupom. Kontinuitet aktuelnosti obrađenih tema i ove godine, kao i prethodnih godina, potvrdile su značaj nacionalnog komiteta CIRED-a za planiranje distributivnih mreža.



Na ovogodišnjem savetovanju, zastupljene su sve bitne preferencijalne teme. Predstavljeni radovi dali su odgovor na neka od pitanja koja se pre svega odnose na integraciju obnovljivih izvora i primenu novih tehnologija. Generalno, ovogodišnji rad komisije za planiranje ukazao je na sledeće nove izazove u planiranju.

Zadaci koji se postavljaju pri planiranju distributivnih mreža odnose se na:

1. Integraciju distribuiranih energetskih resursa, usvajanjem tehnologija pametnih mreža,
2. Digitalizaciju mrežnih operacija, kretanjem ka elektrifikaciji i dekarbonizaciji, i razvojem regulatornih i tržišnih okvira.
3. Ovi trendovi dovode do značajnih promena u načinu na koji se distributivne mreže planiraju, utirući put otpornijoj, efikasnijoj i održivijoj energetskoj budućnosti. Distributivna preduzeća i planeri mreže moraju biti u toku sa ovim trendovima i prihvatiti inovacije kako bi odgovorili na izazove i mogućnosti novog energetskog okruženja.

EC 5 - DISTRIBUTION SYSTEM PLANNING

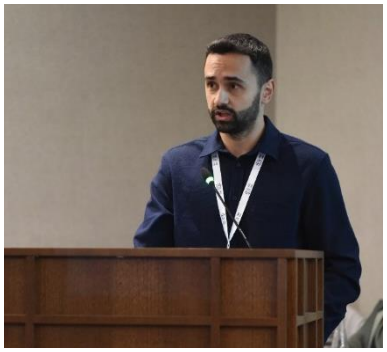
Chairman: Aleksandar Janjić, PhD
GOPA - International Energy Consultants GmbH, Beograd

Within the framework of expert committee 5, a total of 15 papers were presented at this Conference, of which 3 were informational and 12 expert papers. All preferential topics were represented at the Conference, and the authors maintained a high level in the preparation of their papers, both in the choice of topic, the processing of the material itself, and in the presented results.

At this year's Conference, all important preferential topics are represented. The presented papers answered some of the questions that primarily relate to the integration of renewable sources and the application of new technologies. In general, this year's work of the planning commission pointed to the following new challenges in planning.

The tasks that are set when planning distribution networks refer to:

1. Integration of distributed energy resources, by adopting smart grid technologies,
2. Digitization of network operations, moving towards electrification and decarbonization, and development of regulatory and market frameworks.
3. These trends are leading to significant changes in the way distribution networks are planned, paving the way for a more resilient, efficient and sustainable energy future. Distribution companies and grid planners must keep up with these trends and embrace innovation to meet the challenges and opportunities of the new energy environment.



Najzapaženiji rad / *The most prominent paper*:

R-5.9

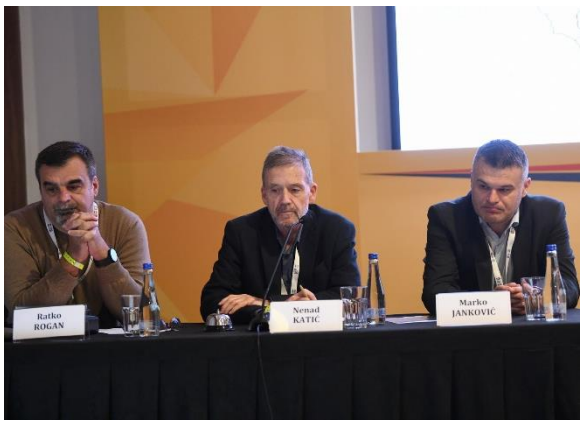
PROCJENA UTICAJA OPŠTIH POKAZATELJA KVALITETA FUNKCIONISANJA DISTRIBUTIVNOG SISTEMA NA REGULATORNO-DOZVOLJENI PRIHOD

ASSESSMENT OF THE IMPACT OF SYSTEM RELIABILITY INDICES ON REGULATORY APPROVED REVENUE

Autori / *Authors*: Katarina KOVAČEVIĆ, Uroš OGNJENOVIĆ

STK 6 – TRŽIŠTE ELEKTRIČNE ENERGIJE I DEREGULACIJA

Predsednik komisije: Dr Nenad Katić
Schneider Electric doo Novi Sad

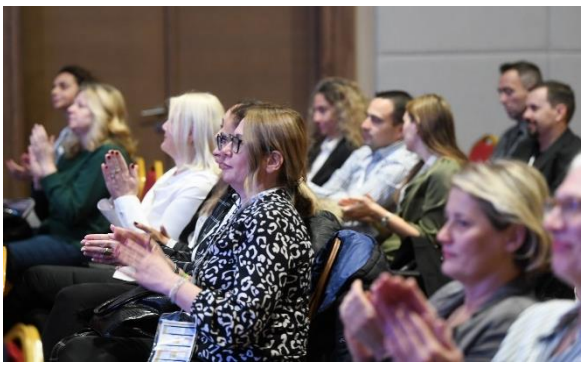


Tokom zasedanja komisije predstavljeni su radovi u okviru preferencijalnih tema. Na osnovu diskusije tokom zasedanja i nakon dodatnih konsultacija komisija je donela sledeće zaključke

1. Regulacija elektroprivrede i tržišta električne energije dalje se unapređuje izmenama i dopunama regulatornih zakona u skladu sa praksom i iskustvima iz primene. U tom smislu, potrebno je dalje nastaviti rad na unapređenju regulative.
2. Zapažen je porast značaja informacionih sistema i unapređenja informatičke podrške u elektroprivrednim delatnostima. Naprimer, dalji razvoj portala „Uvid u račun“ Elektroprivrede Srbije omogućava sve širem spektru korisnika da efikasnije dolazi do različitih komercijalnih i tehničkih informacija i doprinosi efikasnijem korišćenju električne energije.
3. Operator distributivnog sistema dobija sve aktivniju ulogu na tržištu električne energije, a posebno u delu tržišta fleksibilnosti i upravljanja zagušenjima, gde se otvaraju dodatne mogućnosti racionalnijeg korišćenja elektroenergetskog sistema.
4. Pozdravlja se razvoj inovativnih rešenja za podsticanje integracije intermitentnih obnovljivih izvora energije u elektroenergetski sistem i tržište električne energije, a u očekivanju praktičnih primena u narednom periodu.

EC 6 – ELECTRICITY MARKET AND DEREGULATION

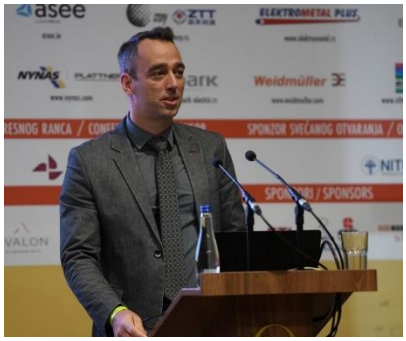
Chairman: Nenad Katić, PhD
Schneider Electric doo Novi Sad



During the committee session, papers were presented within the framework of preferential topics. Based on the discussion during the session and after additional consultations, the committee reached the following conclusions:

1. *The regulation of the electricity industry and the electricity market is further improved by amendments to regulatory laws in accordance with practice and experience from implementation. In this sense, it is necessary to continue work on improving the regulations.*
2. *Increased importance of information systems and improvement in IT support in electrical industry activities was noted. For example, further development of the Electric Power Industry of Serbia's portal "Insight into the electricity bill" enables an ever-widening range of users more efficient access to various commercial and technical information and contributes to more efficient use of electricity.*
3. *The distribution system operator is gaining an increasingly active role in the electricity market, especially in the flexibility and congestion management market, where additional opportunities for more rational use of the power system are opening up.*
4. *The development of innovative solutions encouraging the integration of intermittent renewable energy sources into the power system and the electricity market is welcomed, in anticipation of practical applications in the coming period.*

Najzapaženiji rad / *The most prominent paper*:



R-6.09

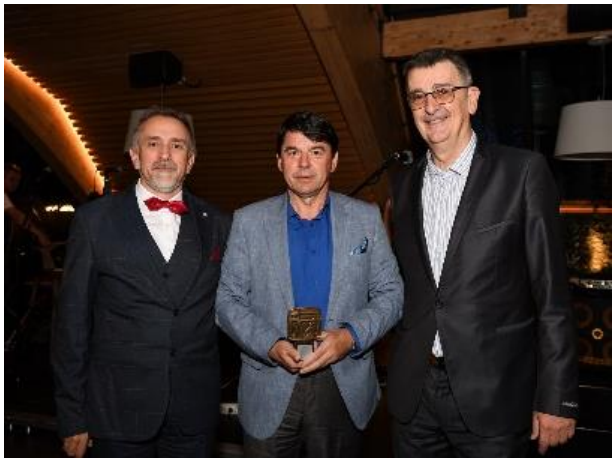
NAČINI (PRE)RASPODJELE TROŠKOVA DEBALANSA NA ČLANOVE UDRUŽENE UNUTAR JEDNE BALANSNE GRUPE

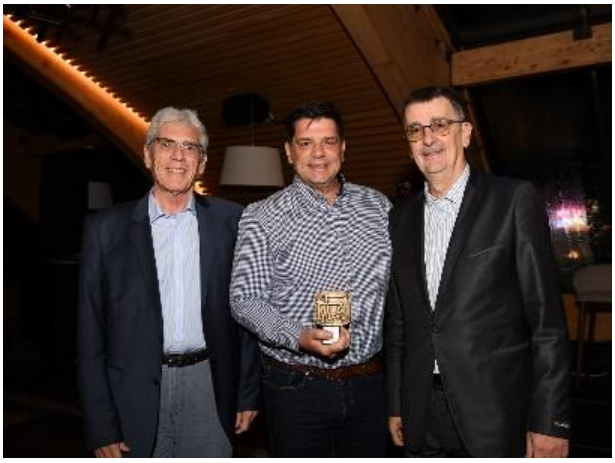
MODES OF IMBALANCE COSTS (RE)DISTRIBUTION TO MEMBERS JOINED WITHIN ONE BALANCING GROUP

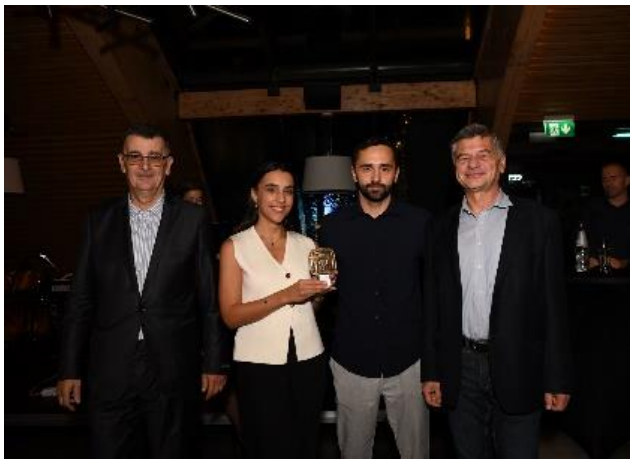
Autori / *Authors*: Miroslav DIVČIĆ, Mladen APOSTOLOVIĆ

Autorima najzapaženijih radova dodeljene su nagrade i CIRED statua u okviru zasebnog koktela održanog tim povodom u četvrtak, 19. septembra. Nagrade prisutnim autorima dodelio je predsednik Nacionalnog komiteta CIRED Srbija, dr Zoran Simendić, uz predsednika svake od šest stručnih komisija.

The authors of the most notable papers were awarded a certificate and a CIRED statue within a separate cocktail held for that occasion on Thursday, September 19. The awards to the authors that were present at the moment were handed by the President of the CIRED Liaison Committee of Serbia, Dr. Zoran Simendić, along with a chairman of each of the 6 expert committees.







OKRUGLI STOLOVI – PANELI / *ROUND TABLES – PANELS*

OKRUGLI STO 1:
Korišćenje podataka iz sistema za upravljanje prekidima (OMS) u planiranju unapređenja pouzdanosti

MODERATORI:
dr Željko Popović, Fakultet tehničkih nauka, Univerzitet u Novom Sadu
Ružica Vranjković, novinar Radio-televizije Srbije

PANELISTI:
Goran Lepović, Siemens d.o.o. Beograd
Marko Rakić, MSc, Schneider Electric doo Novi Sad

KRATAK SADRŽAJ OKRUGLOG STOLA

Na okruglom razmatrane su teme u vezi sa prikupljanjem i korišćenjem podataka i informacija iz automatizovanih sistema za upravljanje prekidima (Outage Management Systems) u procesu definisanja planova održavanja u elektrodistributivnim kompanijama. Podaci prikupljeni kroz automatizovane OMS sisteme omogućuju značajno veću granularnost i preciznost u određivanju parametara na osnovu kojih se definišu planovi održavnja u eletrodistibutivnim kompanijama. Na taj način se omogućuje definisanje planova održavanja koji obezbeđuju optimalan balans između troškova održavanja i unapređenja pouzdanosti isporuke električne energije korisnicima ditributivnog sistema.

Razmatrane teme:
- Primena OMS sistema kompanije Siemens u distributivnim kompanijama u svetu (iskustva, podaci koji se prikupljaju i analiziraju, primena u unapređenju pouzdanosti)
- Primena OMS sistema kompanije Schneider Electric u distributivnim kompanijama u svetu (iskustva, podaci koji se prikupljaju i analiziraju, primena u unapređenju pouzdanosti)
- Pristupi i metodologije za korišćenja podataka iz OMS sistema u planiranju unapređenja pouzdanosti u distributivnim sistemima.

ROUND TABLE 1:
Use of Outage Management System Data in Reliability Planning Improvements

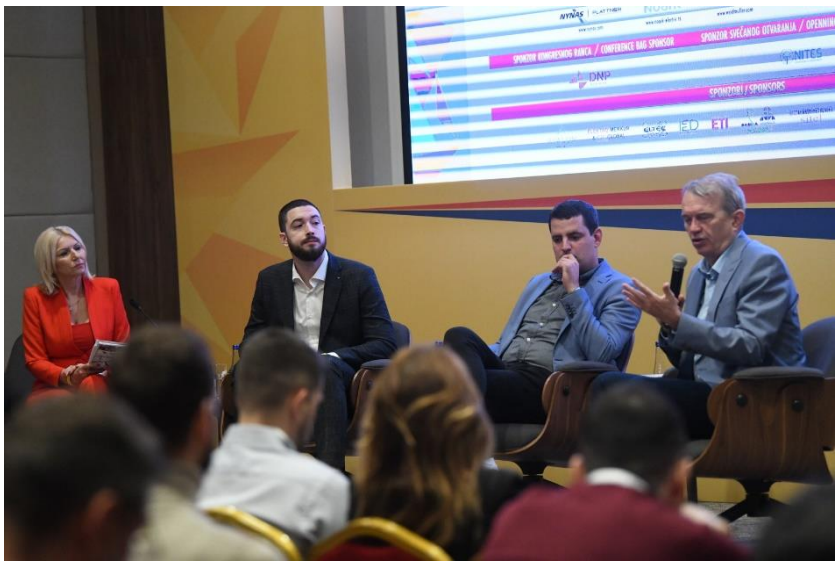
***MODERATORS**:*
dr Željko Popović, Faculty of Technical Scieneces, Novi Sad University
Ružica Vranjković, journalist, Radio-televizije Srbije

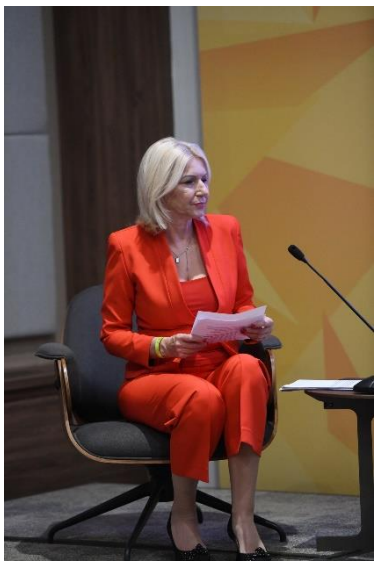
***PANELISTS**:*
Goran Lepović, Siemens d.o.o. Beograd
Marko Rakić, MSc, Schneider Electric doo Novi Sad

SHORT DESCRIPTION OF THE ROUND TABLE

The topics that were discussed at the round table were related to the collection and usage of data and information from the automated Outage Management Systems in the process of defining maintenance plans in power distribution companies. Data collected through automated OMS systems enable significantly greater granularity and precision in determining the parameters that are used as a basis for defining maintenance plans in power distribution companies. In this way, it is possible to define maintenance plans that provide an optimal balance between maintenance costs and improving the reliability of supply of all customers in power distribution systems.

Discussed topics:
- *Application of the Siemens OMS system in power distribution companies worldwide (experiences, data collected and analyzed, application in improving reliability)*
- *Application of Schneider Electric OMS system in power distribution companies worldwide (experiences, data collected and analyzed, application in improving reliability)*
- *Approaches and methodologies for using data from OMS systems in planning the improvement of reliability in distribution systems.*





OKRUGLI STO 2:
Zaključenje ugovora o kupovini električne energije iz OIE – prednosti, prepreke i mere za unapređenje procesa

MODERATOR:
dr Vladimir Šiljkut, Elektroprivreda Srbije AD

PANELISTI:
Danijela Jović Pišot, dipl. prav, Elektroprivreda Srbije AD,
Dunja Grujić, dipl.inž.el., Elektrodistribucija Srbije d.o.o. Beograd
Marko Janković, dipl.inž.el., CWP Global
mr Mladen Apostolović, dipl.inž.el., EFT Group
Radoš Čabarkapa, mast. inž. el. tehn. i rač, EKC Beograd

KRATAK SADRŽAJ OKRUGLOG STOLA

Ugovor o kupovini električne energije iz obnovljivih izvora ili Ugovor o kupovini toplotne energije iz obnovljivih izvora je ugovor koji zaključuju proizvođač energije iz obnovljivih izvora i korporativni kupac. Njime se korporativni kupac obvezuje da kupi određenu količinu energije iz obnovljivih izvora po unapred određenoj ceni, tokom dužeg vremenskog perioda. U većini slučajeva korporativni kupac će dobiti i garanciju porekla, koja se izdaje za svaku jedinicu energije proizvedene energije iz obnovljivih izvora. Tako kupac može dokazati da njegov ugovor o kupovini električne energije, toplotne energije ili gasa (uključujući i vodonik iz obnovljivih izvora), direktno doprinosi određenoj infrastrukturi za proizvodnju energije iz obnovljivih izvora. Na Panelu/Okruglom stolu razmotrene su prednosti, ali i regulatorne prepreke za zaključivanje ovakvih ugovora, kao i moguće mere kojim bi se ono pojednostavilo i ubrzalo.

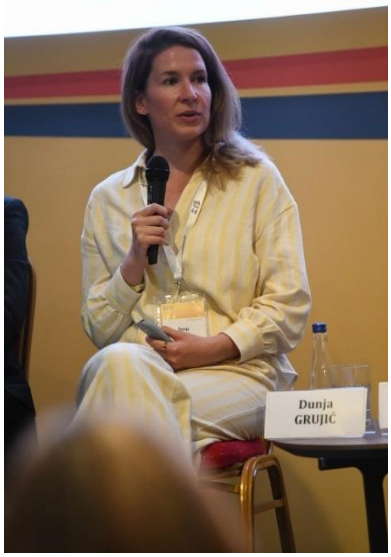
ROUND TABLE 2:
Conclusion of RES Electricity Purchase Contract – Advantages, Obstacles and Measures for Improving the Process

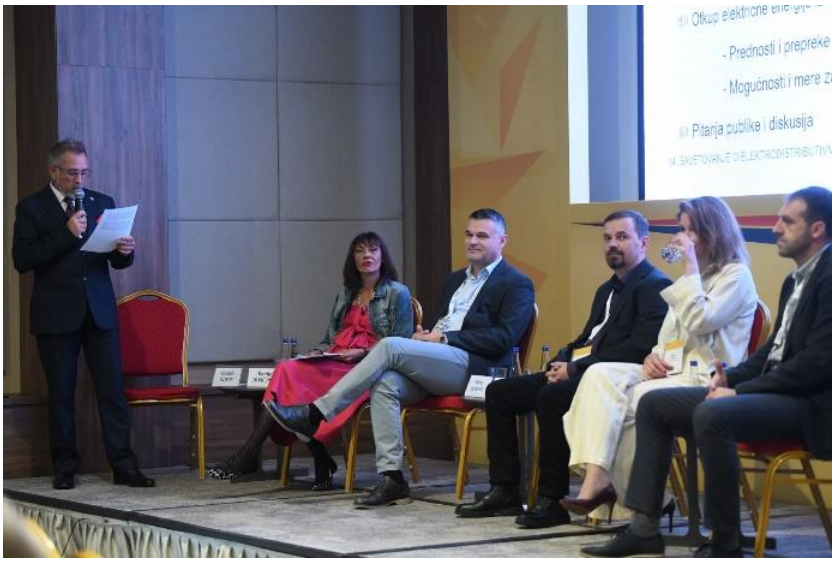
***MODERATOR**:*
dr Vladimir Šiljkut, Elektroprivreda Srbije AD

PANELISTS:
Danijela Jović Pišot, grad. in law, Elektroprivreda Srbije AD,
Dunja Grujić, grad. el. engineer, Elektrodistribucija Srbije d.o.o. Beograd
Marko Janković, grad. el. engineer, CWP Global
mr Mladen Apostolović, grad. el. engineer, EFT Group
Radoš Čabarkapa, ms. engineer of el. engineering and computer science, EKC Beograd

SHORT DESCRIPTION OF THE ROUND TABLE

Contract on the purchase of electricity from renewable energy sources (RES) (i.e., Long-term Power Purchase Agreement, abbr. LT PPA) or Contract on the Purchase of Thermal Energy from RES is a contract concluded by the producer of energy from RES and the corporate customer. It obliges the corporate customer to buy a certain amount of energy from RES at a predetermined price, over a long period of time. In most cases, the corporate customer shall also receive a guarantee of origin, which is issued for each unit of energy produced from RES. Thus, the buyer can prove that his contract for the purchase of electricity, thermal energy or gas (including hydrogen from RES) directly contributes to a certain infrastructure for the production of energy from RES. The Panel/Round Table discussed the advantages, but also the regulatory obstacles to concluding such contracts, as well as possible measures to simplify and accelerate it.





OKRUGLI STO 3:
Primena "Digital Twin" tehnologije u aktivnim distributivnim mrežama

MODERATOR:
mr Dušan VUKOTIĆ, Elektrodistribucija Srbije d.o.o. Beograd

PANELISTI:
Vladimir Stojičić, Elektrodistribucija Srbija d.o.o. Beograd
Zoran Stojanović, Elektrodistribucija Srbija d.o.o. Beograd
dr Željko Cvijetinović, Građevinski fakultet Univerziteta u Beogradu
Momir Mitrović, Preduzeće za geomatiku MapSoft d.o.o. Beograd

KRATAK SADRŽAJ OKRUGLOG STOLA

"Digital twin" tehnologija predstavlja revolucionarni koncept u svetu industrije, omogućavajući virtuelno preslikavanje fizičkih objekata, sistema i procesa u potpunom novom digitalnom okruženju. U slučaju kada posmatramo celokupan elektroenergetski sistem, od tačke proizvodnje do krajnje potrošnje, "Digital twin" (digitalni blizanac) u tom kontekstu je postaje ključni alat za unapređenje performansi, efikasnosti i pouzdanosti rada aktivnih energetskih mreža. "Digital twin" predstavlja virtuelni model fizičkog objekta ili sistema koji je povezan sa stvarnim svetom putem implementiranih senzora i prikupljenih podataka u realnom vremenu, pri čemu omogućava praćenje, simulaciju i optimizaciju procesa, pre nego što nastanu promene u realnom svetu.

Kao uvod u diskusiju prikayani su formirani virtuelni modeli izvornih transformatorskih stanica 110/x kV, koji su trenutno predmet investicionih aktivnosti. Nad realnim primerima virtuelnih fizičkih modela transformatorskih stanica prikazane su odgovarajuće analize i optimizacije koje prvenstveno mogu da se vrše nad tim modelima. Formirani predmetni virtuelni modeli predstavljaju prekretnicu u pristupu kod planiranja i izgradnje elektroenergetskih objekata, i kao neizostavna aktivnost će biti prisutna u najskorijoj budućnosti.

Takođe, u okviru uvoda u diskusiju prikazani su i virtuelni modeli pojedinih NN mreža na konzumnim područjima pojedinih transformatorskih stanica koji su formirani za potrebe „tipizacije" NN mreža. Formiranje virtuelnih modela mreža je vršeno u sklopu izrade Studije kojom je vršena analiza masovne integracije „kupaca-proizvođač" u distributivnu elektroenergetsku mrežu Republike Srbije. U okviru dobijenih modela, posebno su analizirani modeli koji su za cilj imali izračunavanje solarnih potencijala krovova kod krajnjih kupaca, a sve u cilju sagledavanja mogućnosti njihovog priključenja i integracije u aktivne distributivne mreže. Korišćena metodologija za izračunavanje solarnog potencijala prikazana je i na primeru jednog od velikih gradova u Srbiji, gde analizirani primer može da trasira put ka intenzivnijoj izgradnji i priključenju solarnih proizvodnih jedinica pre svega u gusto naseljenim gradskim područjima.,

***ROUND TABLE* 3:**
Application of "Digital Twin" technology in active distribution networks

MODERATOR:
mr Dušan VUKOTIĆ, Elektrodistribucija Srbije d.o.o. Beograd

PANELISTS:
Vladimir Stojičić, Elektrodistribucija Srbija d.o.o. Beograd
Zoran Stojanović, Elektrodistribucija Srbija d.o.o. Beograd
dr Željko Cvijetinović, University of Belgrade, Faculty of Civil Engineering
Momir Mitrović, geomatics company MapSoft d.o.o. Beograd

SHORT DESCRIPTION OF THE ROUND TABLE

Digital twin" technology represents a revolutionary concept in the world of industry, enabling the virtual mapping of physical plants, systems and processes in a completely new digital environment. In the case when we look at the entire power system, from the point of production to the final consumption, "Digital twin" in that context becomes a key tool for improving the performance, efficiency and reliability of active energy networks. "Digital twin" represents a virtual model of a physical plant or system that is connected to the real world through implemented sensors and collected data in real time, thereby enabling monitoring, simulation and optimization of processes, before changes occur in the real world.

As an introduction to the discussion, created virtual models of the original 110/x kV substations, which are currently the subject of investment activities, were presented. Real examples of virtual physical models of substations were presented with appropriate analyzes and optimizations that can primarily be performed on those models. Formed subject virtual models represent a turning point in the approach to the planning and construction of power facilities, and will be present as an indispensable activity in the nearest future.

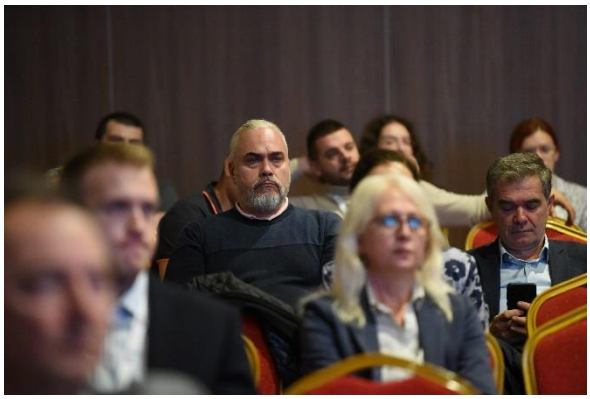
Also, as part of the introduction to the discussion, virtual models of individual LV networks within the consumption areas of individual substations will be shown, which were formed for the purposes of providing "typical" LV networks. The formation of virtual models of networks was carried out as part of the Study which analyzed the mass integration of "prosumers" in the distribution power network of the Republic of Serbia. Within the obtained models, the models that aimed at calculating the solar potential of the roofs of the end customers were specially analyzed, all with the aim of considering the possibility of their connection and integration into active distribution networks. The methodology used for calculating the solar potential were also shown on the example of one larger city in Serbia, where the analyzed example can mark out a route to more intensive construction and connection of solar production units, primarily in densely populated urban areas.

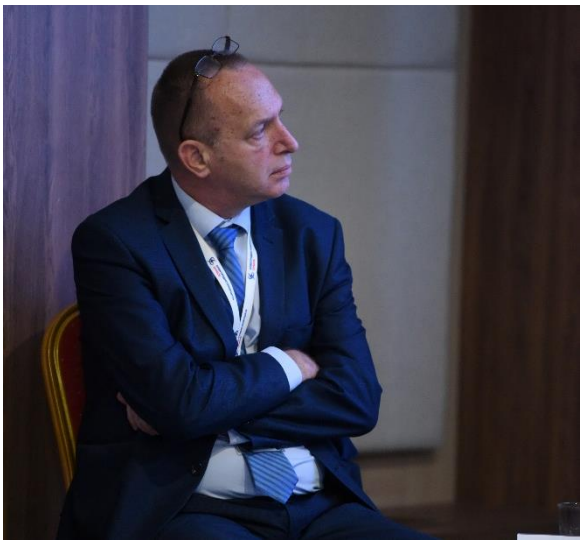
Iako „Digital twin“ tehnologija nudi značajne prednosti, njena trenutna primena nije bez izazova. Ključni izazovi uključuju zahteve za skladištenjem velikih količina podataka, obezbeđivanje bezbednosti i privatnosti. Zahtevi koji se odnos prikupljanje, skladištenje i analizu ogromnih količina podataka, predstavlja nesumnjivo veliki tehnički i ekonomski izazov.

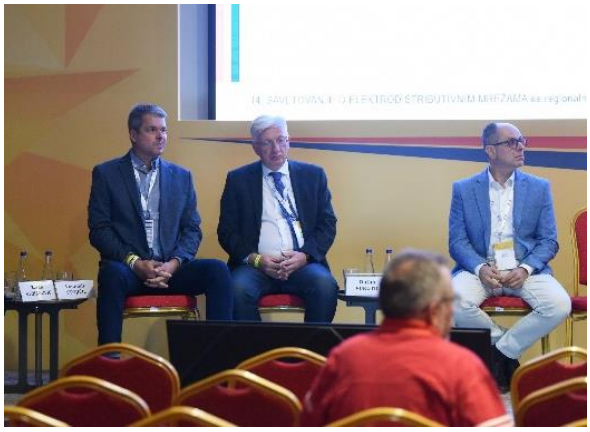
Primena „Digital twin“ tehnologije u aktivnim distributivnim mrežama svakako predstavlja korak ka inteligentnijim, efikasnim i pouzdanim mrežama. Budući da se očekuje dalji intenzivni razvoj ove tehnologija, očekuje se da će virtuelni digitalni modeli postati neizostavan deo savremenih elektroenergetskih mreža.

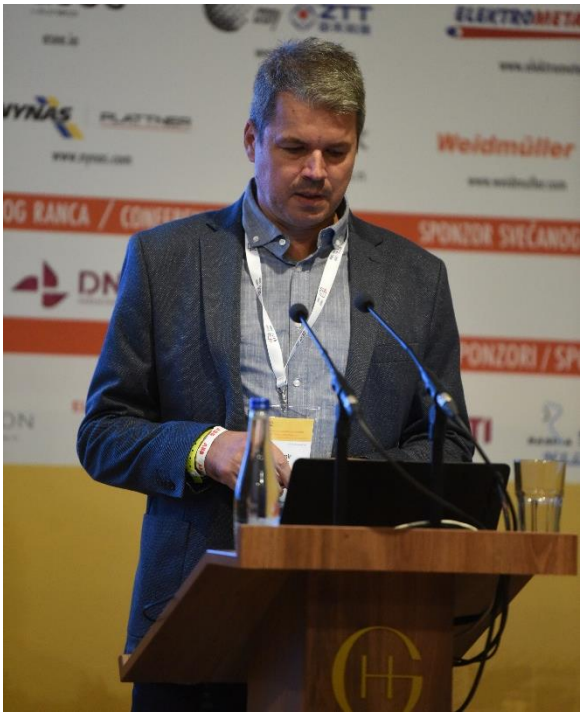
Although "Digital twin" technology offers significant advantages, its current implementation is not without challenges. Key challenges include requirements for storage of large amounts of data, ensuring security and privacy. The requirements related to the collection, storage and analysis of huge amounts of data are undoubtedly a great technical and economic challenge.

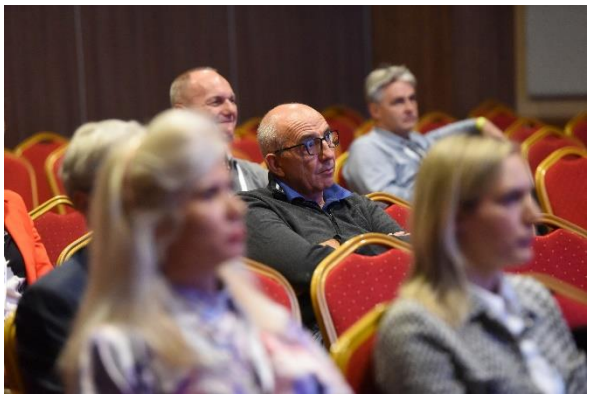
The application of "Digital twin" technology in active distribution networks certainly represents a step towards more intelligent, efficient and reliable networks. Since further intensive development of this technology is expected, it is expected that virtual digital models will become an indispensable part of modern power networks.











POSLOVNE PREZENTACIJE / *BUSINESS PRESENTATIONS*

Utorak / *Tuesday*, 17.09.2024.

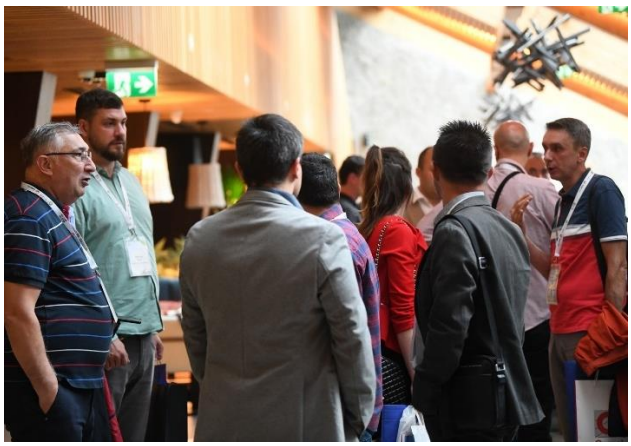
Josif Pančić B	15:00-15:45	Schneider Electric Srbija
Josif Pančić B	16:00-16:45	MT-Komex
Josif Pančić B	17:00-17:45	Meter&Control
Josif Pančić B	18:00-18:30	ASEE: X - Softverska platforma za podršku distribuciji i snabdevanju / *X - Software platform for* support in distribution and supply
Josif Pančić B	19:00-19:45	Siemens Srbija
Kopaonik	16:00-16:45	GE Vernova
Kopaonik	17:00-17:45	ABB
Kopaonik	18:00-18:45	Elnos Group

Sreda / *Wednesday*, 18.09.2024.

Josif Pančić B	15:00-15:20	Uniprom: Kablovi i sistemi nosača kablova za održanje funkcionalnosti u uslovima požara prema standardu DIN 4102 deo 12 / *Cables and cable trays systems with integrated maintenance of electrical functionality according to standard DIN 4102-12*
Josif Pančić B	15:30-15:50	Konvex Electric / Phoenix Contact: Rešenja za upravljanje zelenom energijom / *Solutions for green energy managment*
Josif Pančić B	16:00-16:20	Crony
Josif Pančić B	16:30-16:50	Rittal / Eplan
Josif Pančić B	17:00-17:45	PowerGrid Engineering: Najnovija SEL rešenja u oblasti zaštite i upravljanja distributivnih mreža / *Latest SEL solutions in protection and automation of distribution networks*
Kopaonik	15:00-15:20	Plattner / Nynas: Inhibirana transformatorska ulja – demistifikacija trendova, razlike i sličnosti / *Inhibited Transformer Oils - demystifying trends, differences and similarities*
Kopaonik	15:30-15:50	Energy Bridge Consulting: Inovacija u Energetici: Merenje impedanse mreže za pametne elektroenergetske sisteme / *Innovation in Energy Sector: Grid Impedance Analysis for Smart Power Systems*
Kopaonik	16:00-16:20	Weidmuller: PROCON web i RESMA energy
Kopaonik	16:30-17:15	TF Kable Zaječar
Kopaonik	17:30-18:15	Marti Komerc / Nexans

Sve planirane prezentacije su održane i bile su dosta dobro posećene. Učesnici konferencije imali su prilike da čuju o poslovnim aktivnostima kompanija u prethodnom periodu i proizvodima i uslugama koje nude.

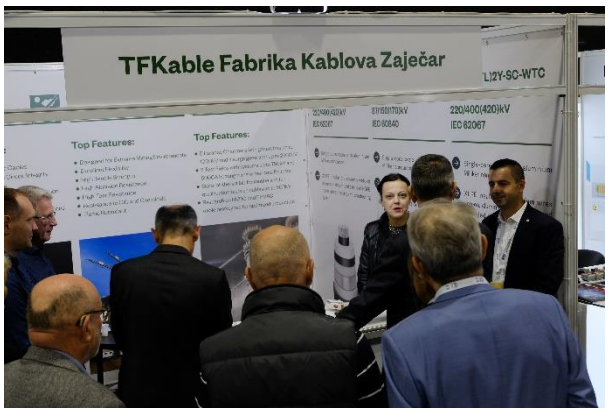
All business presentations were held and well atended. Participants had the oportunity to get informatio regarding new business solutions of the companies presenting.



IZLOŽBA OPREME I USLUGA / *EXHIBITION OF EGUIPMENT AND SERVICES*

Tokom Savetovanja, organizovana je i izložba opreme, usluga i novih tehnologija iz oblasti elektrodistribucije na kojoj su učestvovale mnoge strane i domaće kompanije.

During the Conference, an exhibition of equipment, services, and new technologies from the field of electricity distribution was organized, in which many foreign and local company took part.



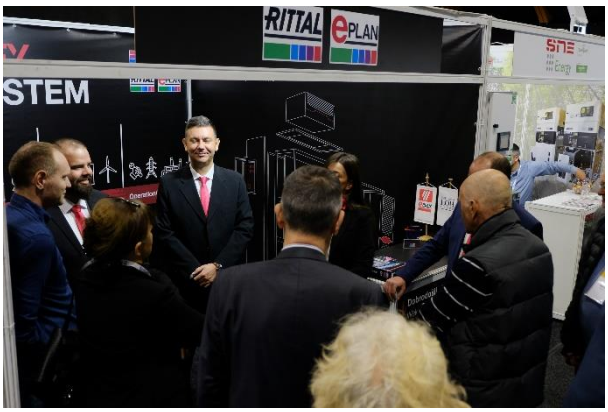
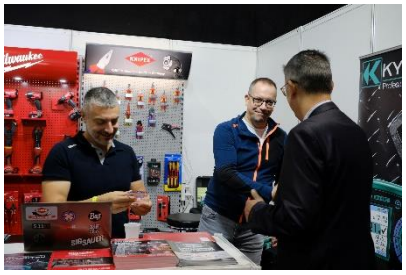
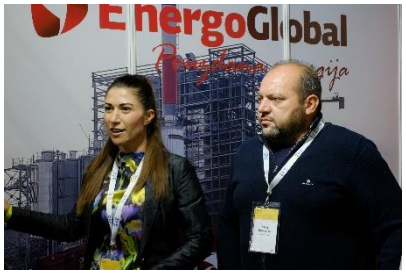


ABB
Avalon Partners
Bedrock
Comel
Dalekovod Proizvodnja
OSO
DNP-INŽENJERING
EL-CO
Elektro Merkur
Elektroinštitut Milan Vidmar
Elektrometal Plus
Elektrotehnički institut DEC
Elnos Group
ELTEC Export-Import
Enel PS / Enel tre solare
Energize
EPLAN / RITTAL
ETI B
Feman
FMT - Fabrika mernih transformatora
GE Grid Solutions
GPS INSULATORS
Green Plus
I E D d.o.o. Beograd
Infoprojekt/ SRC Soft
Iskraemeco
Južna Bačka / Elektromontaža
Kolektor ETRA
Konvereks
KONVEX ELECTRIC
MARTI KOMERC
Meter&Control
Minel Trafo doo
MINS Elektro
MT-Komex
NOARK Electric Europe
Pfiffner / Navitas
PLAMEN
Rasina
SATURN Electric
Schneider Electric
Schneider Electric HUB
NS
Siemens
SIGMATEH
Sitel
SNE Energy
SOMBORELEKTRO
TECTRA
Unior Teos alati
VESIMPEX
WEIDMULLER





SVEČANO OTVARANJE / *OPENNING CEREMONY*

U umetničkom delu programa Svečanog otvaranja savetovanja nastupila je plesna grupa UV dance.

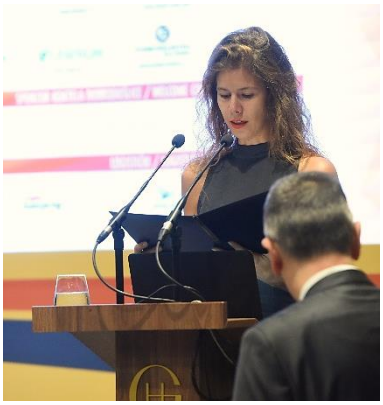
Koktel dobrodošlice standardno je održan nakon ceremonije otvaranja i kao i do sada bio je prilika za susrete starih prijatelja i kolega i prilika za nove učesnike savetovanja CIRED Srbija da se predstave i upoznaju.

The artistic program of the Opening Ceremony was performed by dance group UV dance.

A welcome coctail standardly followed the opening ceremony and as always represented the opportunity for encounters of old colleagues and an opportunity for new participants of CIRED Serbia meeting and exhibition to present them selves.





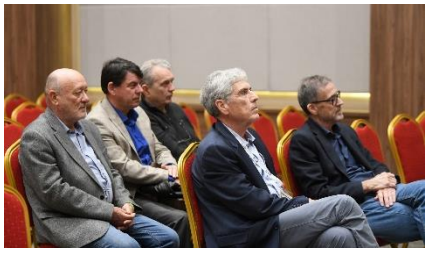


SASTANAK IZVRŠNOG ODBORA / *EXECUTIVE COMMITTEE MEETING*

Sastanak izvršnog i nadzornog odbora Nacionalog komiteta CIRED Srbija održan je u okviru Savetovanja, 19. septembra 2024. godine. Analizirani su rezultati proteklog 14 Savetovanja i konstatovano je da je bilo uspešno.

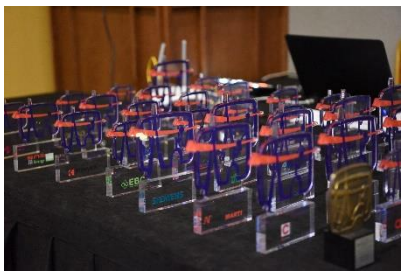
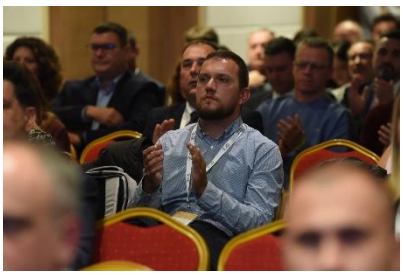
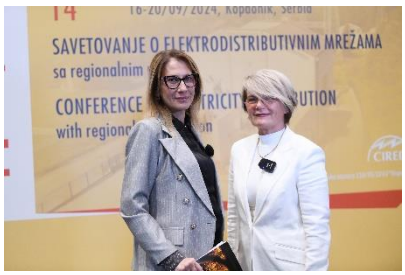
The meeting of the Executive and Supervisory Committees of the CIRED Laison Committee of Serbia was held within the Conference, on September 19, 2024. The results of the 14th Conference were analyzed and it was concluded that it was a success.

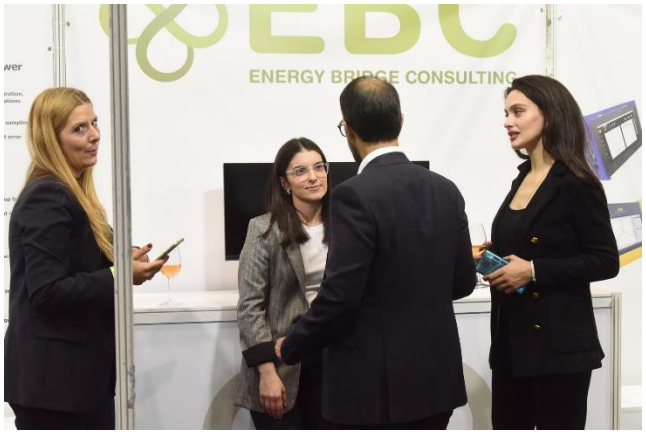
SKUPŠTINA CIRED SRBIJA / *CIRED SERBIA ASSEMBLY*

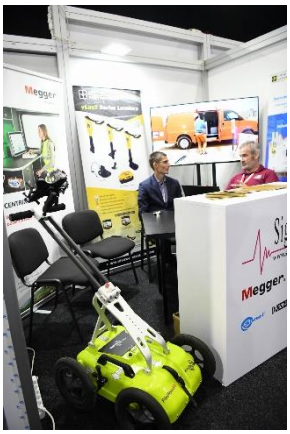


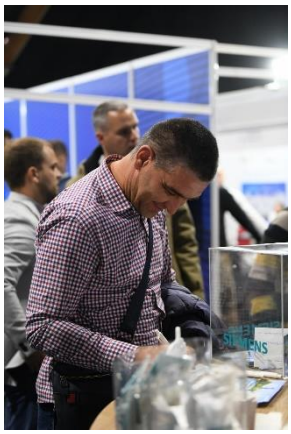
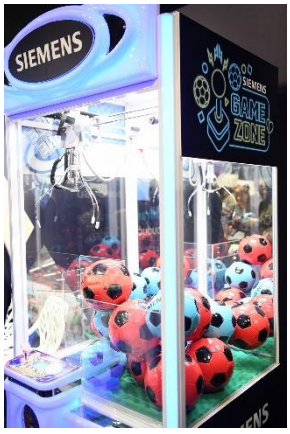
Sastanak Skupštine Nacionalnog komiteta CIRED Srbija je održan u okviru Savetovanja, 19.9.2024. godine. Na njemu je jednoglasno usvojen Izveštaj o radu predsednika Skupštine i Izvršnog odbora između dve redovne sednice Skupštine.

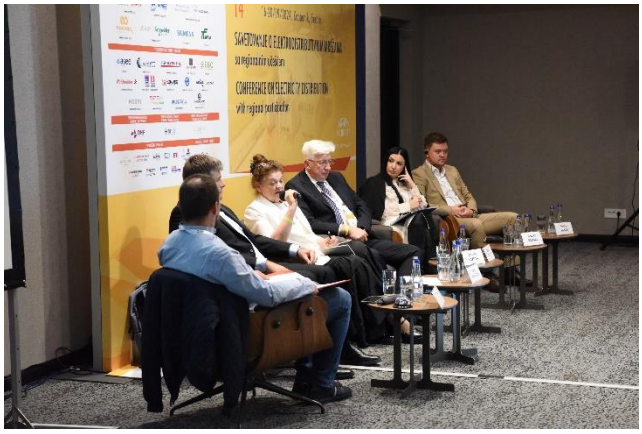
The meeting of the Assembly of CIRED Serbia Liaison Committee was held during Conference, on September 19, 2024. year. It unanimously adopted the Report on the work of the President of the Assembly and the Executive Board between two regular sessions of the Assembly.

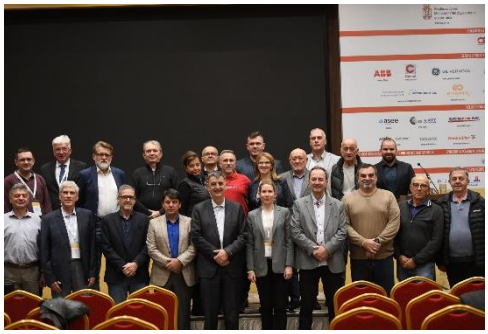










KONTAKT PODACI / *CONTACT DETAILS*

Za sva pitanja u vezi sa Savetovanjima CIRED Srbija možete kontaktirati tehnički sekretarijat.

For all questions regarding CIRED Liaison Committee Conferences you may contact the technical secretariat.

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