20 godina Nacionalnog komiteta CIRED Srbija

NACIONALNI KOMITET CIRED SRBIJA
CIRED LIAISON COMMITTEE OF SERBIA
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IZVEŠTAJ SA SAVETOVANJA
CONFERENCE REPORT

10. JUBILARNO SAVETOVANJE O ELEKTRODISTRIBUTIVNIM MREŽAMA SRBIJE sa regionalnim učešćem
10th JUBILEE CONFERENCE ON ELECTRICITY DISTRIBUTION IN SERBIA with regional participation

CIRED

Vrnjačka Banja, 26-30.septembar 2016

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X SAVETOVANJE O ELEKTRODISTRIBUTIVNIM MREŽAMA SRBIJE
sa regionalnim učešćem

Srbija, Vrnjačka Banja, Hotel Zvezda
26 - 30. septembar 2016.

X CONFERENCE ON ELECTRICITY DISTRIBUTION IN SERBIA
with regional participation

Serbia, Vrnjacka Banja, Zvezda Hotel
September 26 - 30, 2016

IZVEŠTAJ SA SAVETOVANJA
CONFERENCE REPORT

Organizator:
Nacionalni komitet CIRED Srbija u saradnji sa nacionalnim komitetima CIRED Crne Gore i CIRED Rumunije i drugim komitetima, kompanijama i stručnjacima iz ostalih zemalja regiona

Organized by:
CIRED National Committee of Serbia in cooperation with CIRED committee of Montenegro and Romania and other committees, companies and experts from the region

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Organizator: Nacionalni komiteti CIRED Srbije u saradnji sa nacionalnim komitetima CIRED Crne Gore i CIRED Rumunije i drugim komitetima, kompanijama i stručnjacima iz ostalih zemalja regiona

Nacionalni komitet CIRED Srbije je profesionalna i stručna organizacija, posvećena razmeni znanja i iskustva u oblasti distribucije električne energije. Okuplja istaknute stručnjake iz elektroprivrednih 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 CIRED committees of Montenegro and Romania and other committees, companies and experts from 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, institutes and others 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.

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Savetovanje je podržalo i Ministarstvo rudarstva i energetike Republike Srbije

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

Conference is also supported by the Ministry of Mining and Energy of the Republic of Serbia

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*
Dr Dragoslav JOVANOVIĆ	Član CIRED Srbija / Member of CIRED LC of Serbia
Goran RADOVANOVIĆ	JP EPS -Tehnički centar / *PE Electric Power Industry of Serbia– Technical Center*
Srđan DJUROVIĆ	ODS "EPS Distribucija" d.o.o. Beograd, Kraljevo / *Belgrade El. Distribution Co. Kraljevo*
Slobodan KUJOVIĆ	JP Elektroprivreda Srbije / PE *Electric Power Industry of Serbia*
Marija ERDELJAN	Tehnički sekretar CIRED Srbija / *Technical secretary of CIRED LC of Serbia*

UVODNA REČ / *INTRODUCTORY WORD*

X SAVETOVANJE O ELEKTRODISTRIBUTIVNIM MREŽAMA SRBIJE sa regionalnim učešćem koje se organizuje pod pokroviteljstvom CIRED - Međunarodne konferencije za elektrodistribuciju, održano je u Vrnjačkoj Banji od 26.09. do 30.09.2016. godine.

Savetovanje je kao i do sada bilo veoma dobro posećeno. Prema izvedenim podacima na skupu je prisustvovalo 730 registrovanih učesnika, kako autora referata i predstavnika firmi koje su učestvovale u komercijalnoj izložbi, tako i onih zainteresovanih za izlaganja autora ili posetu izložbi. Broj komercijalnih učesnika ove godine dostigao je rekordni broj od čak 61 kompanije. Takođe, sa 147 učesnika iz inostranstva, Savetovanje je još jednom potvrdilo svoj regionalni karakter. Najviše inostranih učesnika došlo je kao i uvek iz Bosne i Hercegovine - 68, Crne Gore - 32, Slovenije – 15, uz učesnike iz Mađarske, Nemačke, Rumunije, Hrvatske, Češke, Austrije, Makedonije, Španije, SAD, Turske, Švajcarske, Indije i Holandije.

Ove godine Savetovanje je unelo određene izmene kako u programskom sadržaju skupa tako i u prostornoj organizaciji izložbe, kako bi omogućio većem broju kompanija da na istoj učestvuje.

Prvog radnog dana održana je skupština CIRED SRBIJA.

***X CONFERENCE ON ELECTRICITY DISTRIBUTION IN SERBIA with regional participation**, supported by CIRED, the International Conference on Electricity Distribution, was held in Vrnjacka Banja from 26nd – 30th September, 2016.*

According to collected data, as always, the Conference was very well-attended. There were 730 registered participants, including paper authors, representatives of the exhibiting companies, and also participants showing interest in both papers and the exhibition. A number of commercial participants reached a record number with 61 firms. With 147 foreign participants, the Conference confirmed its regional character. As within previous times, most of foreign participants came from Bosnia & Herzegovina – 68, followed by Montenegro - 32, Slovenia – 15 and participants from Hungary, Germany, Romania, Croatia, Czech Republic, Austria, Macedonia, Spain, SAD, Turkey, Switzerland, India and Netherlands.

This year certain changes were made in both conference program and spacial organization, increasing opportunity to participate in the commercial exhibition for a greater number of companies.

The Assembly of CIRED SERBIA was held on a first day.

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

DR ZORAN SIMENDIĆ

SVEČANO OTVARANJE / *OPENING CEREMONY*

X savetovanje o elektrodistributivnim mrežama Srbije sa regionalnim učešćem otvoreno je na svečanoj ceremoniji u Hotelu Zvezda u Vrnjačkoj Banji 26. septembra 2016. godine u 18:00 časova. Ceremoniji otvaranja prisustvovalo je standardno, preko 500 ljudi.

Olivera GUDŽULIĆ, načelnik Odeljenja za elektroenergetske i tehničke poslove, Sektora za elektroenergetiku Ministarstva rudarstva i energetike Republike Srbije, zvanično je otvorila X Savetovanje.

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

CIRED savetovanje u Srbiji pismenim putem je pozdravio i predsednik CIRED Rumunije, gospodin **Ioan SILVAS**. U kratkom dopisu gospodin Silvas pozdravio je rad Nacionalnog komiteta CIRED Srbija i učesnicima skupa poželeo uspešan rad tokom Savetovanja i prijatan boravak.

Skup su pozdravili i:

Velimir STRUGAR, CIRED Crne Gore

Dejan POPOVIĆ, član Nadzornog odbora Elektroprivrede Srbije, generalnog pokrovitelja Savetovanja

Prema tradiciji na Svečanom otvaranju dodeljene su zahvalnice generalnom pokrovitelju savetovanja kao i zlatnim i velikim sponzorima, I velikom pokrovitelju.

The X Conference on Electricity Distribution of Serbia with regional participation was opened at the official ceremony in the Hotel Zvezda in Vrnjacka Banja held on September 26, 2016 at 18h. More than 500 participants were present.

***Olivera GUDŽULIĆ**, head of department for energy and technical operations within Energy Sector in Ministry of Mining and Energ of the Republic of Serbia, has officially opened the X Conference.*

*President of CIRED Liaison committee of Serbia, **Zoran SIMENDIĆ, PhD** gave a short introductory speech welcoming all the participants, sponsors and many guests from abroad.*

*CIRED Conference in Serbia was also greeted in a written form by Mr **Mr Ioan SILVAS,** president of the CIRED Romania. In a brief letter Mr Silvas welcomed the work of the Liaison Committee of CIRED Serbia and wished to all the participants a successful work during the Conference and an enjoyable stay.*

The introductory words were also given by:

***Velimir STRUGAR**, CIRED Montenegro*

***Dejan POPOVIC**, member of the Electric Power Enterprise of Serbia board, the general endorser of the Conference*

Following the tradition of the CIRED conference gratitude was given to General Sponsor as well as to Golden, Great and to Great Donor.

Zahvalnice su primili:
Generalni pokrovitelj Savetovanja:
Dejan POPOVIĆ, JP Elektroprivreda Srbije

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Ilija CVIJETIĆ, AD Elektromreža Srbije
Milenko NIKOLIĆ, Institut Mihajlo Pupin - Automatika
Srdan SRDANOVIĆ, SIEMENS Beograd
Dejan MARKOVIĆ, Schneider Electric Beograd
Milorad MILOVANOVIĆ, NHBG Žiks-Hard

Za tehničku podršku Savetovanjima:
Branka BJELICA, Marko POPOVIĆ, BBN Congress Management doo

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Dirk ZIEMER, OMICRON, Austrija

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Dušan TORBICA, ELNOS BL, Republika Srpska
Zoran RABRENOVIĆ, Weidmuller
Dejan ĆURČIĆ, Elektrokoil
Nenad ŽIVKOVIĆ, Minel Dinamo
Aleksandar BOGAVAC, Minel Trafo

Sponzor svečanog otvaranja:
Radiša KOSTIĆ, ELEKTROISTOK Izgradnja, Srbija

Zahvalnicu za doprinos u razvoju elektrodistributivne delatnosti i srebrnjak Nikole Tesle dobio je:
Dr Dragoslav JOVANOVIĆ, prethodni predsednik CIRED Srbija

Gratitudes were given to:
General Endorser of the Conference:
***Dejan POPOVIC**, Power Industry of Serbia*

For giving support to all CIRED Conferences in Serbia:
***Ilija CVIJETIĆ,** Elektromreža Srbije*
***Milenko NIKOLIĆ**, Institut Mihajlo Pupin Automatika*
***Srdan SRDANOVIĆ**, SIEMENS Beograd*
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Gratitude for the contribution within development of distribution area and Nikola Tesla silver coin was given to:
***Dragoslav JOVANOVIC**, PhD, previous president of CIRED Serbia*

ZAKLJUČCI STRUČNIH KOMISIJA / *EXPERT COMMITTEES CONSLUSIONS*

FORUM SMART GRID
Moderator: dr Zoran SIMENDIĆ
EPS Distribucija, Ogranak ED Sombor

U okviru FORUM SMART GRID prezentovano je 4 rada od ukupno 4, koji su uvršćeni u program Savetovanja.

Nakon prezentacije radova usvojeni su sledeći zaključci:

1. Nastaviti dosadašnje integracije SCADA, distributivnog menadžment sistema i drugih podsistema u integralni sistem kako bi se ispunili sve brojniji i oštriji zahtevi koji se pred njih postavljaju.
2. Preporučuje se da početna ulaganja u izgradnju SMART GRID sistema budu u podsisteme koji daju najveće efekte.
3. Analiza eksploatacije i rada obnovljivih izvora električne energije radi povećanja efikasnosti rada je jedan od prioriteta.
4. Naglašena važnost neprekidnog prikupljanja i ažuritanja podataka o SN i NN mreži i ona je preduslov za SMART GRID sisteme.

SMART GRID FORUM
Moderator: Dr. Zoran SIMENDIĆ
EPS Distribucija, Ogranak ED Sombor

For SMART GRID FORUM 4 papers were presented out of a total of 4, which were included in the Conference programme.

After presenting the papers, the following conclusions were adopted:

1. Continue the former SCADA, distribution management system and other subsystem integrations into an integral system, in order to fulfill the increasing number of requirement they have to meet.
2. It is recommended that initial investments concerning SMART GRID system construction be into subsystems with the greatest effects.
3. Analysis of utilization and operation of renewable energy sources for more efficient electricity production is one of the priorities.
4. Highlighting the importance of continuously gathering and updating the data on MV and LV grid, which is the prerequisite for SMART GRID systems.

STK 1 – KOMPONENTE MREŽA
Predsednik komisije: Prof. dr DRAGAN TASIĆ
Elektronski fakultet, Niš, Srbija

U okviru STK-1, Komponente mreža, prezentovano je 25 radova od ukupno 28, koliko je uvršćeno u program Savetovanja. Radom komisije rukovodio je prof. dr Dragan Tasić uz pomoć stručnih izvestilaca Ljiljane Funduk, mr Miodraga Stojanovića i dr Vladimira Šiljkuta. Nakon prezentacije radova usvojeni su sledeći zaključci:

1. Potrebno je adekvatno sagledati predloge novih tehničkih rešenja i nove opreme, kako sa tehničke tako i sa ekonomske strane.
2. Podsticati primenu novih tehnoloških rešenja i tehnologija i vršiti analizu eksploatacionih iskustava.
3. Analizi eksploatacionih iskustava posvetiti adekvatnu pažnju, kako sa aspekta održavanja komponenti mreža, tako i sa aspekta predviđanja budućih stanja.
4. Proračunu pouzdanosti komponenti, kao i celine mreža i postrojenja, treba i dalje posvećivati pažnju, kako bi se sa jedne strane došlo do formiranja odgovarajućih modela i softverskih rešenja jednostavnih za praktičnu primenu, a sa druge do tehničkih rešenja koja omogućavaju pouzdanije snabdevanje potrošača električnom energijom.
5. Neophodno je raditi na principima dijagnostike komponenti mreža i na unapređivanju strategije održavanja opreme, kao i strategije zamene postojeće opreme novom.
6. Potrebno je koristiti adekvatne matematičke modele i podsticati primenu savremenih softverskih alata za analizu mrežnih komponenti u normalnim radnim i havarijskim stanjima.
7. Pokrenuti inicijativu za formiranje akreditovane laboratorije za ispitivanje opreme mrežnih komponenti.
8. Neophodno je analizirati efekte uticaja komponenti mreža na životnu sredinu i preduzeti mere za smanjenje štetnih uticaja. Potrebno je povremeno kritički sagledati postojeću zakonsku regulativu u ovoj oblasti.

SESSION 1 – NETWORK ELEMENTS
Chairman: Prof. Dr. DRAGAN TASIĆ
Faculty of Electronics, Niš, Serbia

Within Session - 1, Distribution substations and power lines, 25 papers were presented out of a total of 28 papers included in the Conference programme. Prof. Dr. Dragan Tasić conducted the Session work with the assistance of expert reporters Ljiljana Funduk, Miodrag Stojanović, M.Sc. and Dr. Vladimir Šiljkut. After presenting the papers, the following conclusions were adopted:

1. The proposed new technical solutions and new equipment should be adequately perceived, both from the technical, and from the economic standpoint.
2.The implementation of new technological solutions and technologies should be stimulated and operating experience analyzed.
3. Adequate attention should be dedicated to the analysis of operational experience, both from the aspect of distribution substations and power lines maintenance, and from the aspect of envisaged future states.
4. Attention should continuously be dedicated to calculations of the components reliability as well as the entire grid and facilities reliability, in order to form easily applicable adequate models and software solutions on the one hand, and technical solutions providing more reliable electricity supply to consumers on the other hand.
5. It is necessary to deal with the principle of grid components diagnostics and improvement of the equipment maintenance strategy, as well as the strategy of replacing the existing equipment by new equipment.
6. It is necessary to use adequate mathematical models and stimulate the implementation of state of the art software tools for analyzing the network components in normal and emergency conditions.
7. An initiatiative should be given on forming an accredited laboratory for testing the grid components equipment.
8. It is necessary to analyze the environmental impact of grid components and take measures on reducing the harmful effects. It is necessary to critically perceive from time to time the existing legislation in this field.

Najzapaženiji rad / *the most prominent paper*:

R-1.17 SOPSTVENE I MEĐUSOBNE IMPEDANSE ELEKTROENERGETSKIH KABLOVA / *SELF AND MUTUAL IMPEDANCES OF POWER CABLES*
M. STOJANOVIĆ, D. TASIĆ, N. CVETKOVIĆ, Univerzitet u Nišu, Elektronski fakultet, Niš, Srbija

STK 2 - KVALITET ELEKTRIČNE ENERGIJE I ELEKTROMAGNETNA KOMPATIBILNOST

Predsednik: Prof. dr Vladimir KATIĆ, Fakultet tehničkih nauka Univerziteta u Novom Sadu
U odsustvu predsednika, predsedavao je doc. dr Boris DUMNIĆ, Fakultet tehničkih nauka Univerziteta u Novom Sadu.

U okviru ove stručne komisije, predstavljeno je 16 radova, koji su obuhvatili 6 preferencijalnih tema. Stručni izvestioci su bili Lidija KORUNOVIĆ i Milanko RADIĆ, EPS Tehnički centar Novi Sad.

ZAKLJUČCI:

Kod praćenja pokazatelja kvaliteta isporuke, posebno obratiti pažnju na uzroke kvarova zbog usmerenog planiranja investicija i održavanja.

U situacijama u mreži koje su karakteristične sa pojavom velikih struja nultog provodnika formulisati tehničke preporuke primene četvoropolnog isključenja.

U održavanju ormana za kompenzaciju posebnu pažnju obratiti na ispravnost veza jer prekid jedne faze dovodi do pogrešnog merenja.

Izbor i koordinacija uređaja prenaponske zaštite uskladiti sa stvarnim pogonskim uslovima.

Uslovi rada i priključenja distribuiranih izvora energije zasnovanih na primeni invertorskih uređaja uskladiti sa tehničkim preporukama i pravilima o radu EES-a razvijenih zemalja.

SESSION 2 - POWER QUALITY AND ELECTROMAGNETIC COMPATIBILITY

Chairman: Prof. Dr. Vladimir KATIĆ, Faculty of Technical Sciences, University of Novi Sad
In the absence of the Chairman, the session was chaired by Assistant Professor Dr. Boris DUMNIĆ, Faculty of Technical Sciences, University of Novi Sad.

In this session, 16 papers were presented, covering 6 preferential subjects. The reporters were Lidija KORUNOVIĆ and Milanko RADIĆ, EPS Technical Centre Novi Sad.

CONCLUSIONS:

When monitoring the supply quality indicators, special attention should be dedicated to the causes of faults due to directed investments and maintenance planning.

In grid situations, with typical zero conductor, large currens form technical recommendations for applying a four-pole disconnection.

In maintenance of the compensation cuble, one should particularly check whether the connection is good, as a disconnection of one phase results in inaccurate metering.

Selection and coordination of device for overvoltage voltage protection should comply to the actual operating conditions.

The operating conditions and conditions for connecting the distributed energy sources based on the implementation of invertor devices should comply to the technical recommendations and rules concerning the operation of Electric Power Systems of developed countries.

Najzapaženiji rad / the most prominent paper:

R-2.15 PROBLEM ZAŠTITE 35 Kv POSTROJENJA SA IZOLOVANOM NEUTRALNOM TAČKOM U PLANINSKOM PODRUČJU OD PRENAPONA / *AN OVERVOLTAGE PROTECTION PROBLEM OF THE 35 KV SUBSTATION WITH INSULATED NEUTRAL CONNECTED TO OVERHEAD LINE IN MOUNTAINOUS REGIA*
Milan SAVIĆ, Mileta ŽARKOVIĆ, Ratko KOVAČIĆ, Elektrotehnički fakultet iz Beograda, Marko MIJIĆ, Elnos BL, Banja Luka, Mladen BANJANIN, Elektotehnički fakultet, Istočno Sarajevo

STK 3 - ZAŠTITA I UPRAVLJANJE ELEKTRODISTRIBUTIVNIM MREŽAMA

Predsednik komisije: mr Dušan Vukotić
ODS "EPS Distribucija" d.o.o. Beograd

U okviru STK-3 prezentovano je 13 (trinaest) radova i informacija od ukupno 15 (petnaest) referata, koji su prihvaćeni u program ovogodišnjeg Savetovanja.

Nakon prezentacije radova doneseni su sledeći zaključci po pitanju više tema iz oblasti zaštite i upravljanja u elektrodistributivnim mrežama:

1. Automatizacija srednjenaponske elektrodistributivne mreže (SNDM) je poslednjih godina dobila na punom intezitetu i u okviru SNDM meže trenutno je instaliran relativno veliki broj opreme za automatizaciju. Veliki broj radova imao je upravo u fokusu iskustva koja postoje u dosadašnjoj eksploataciji opreme za automatizaciju i u velikoj meri inskustva se pokalapaju, ali evidentno postoji i prisutna heterogenost u primeni određenih tehničkih rešenja. Aktivnosti na definisanju jedinstvenih tehničkih specifikacija opreme za automatizaciju u okviru određenih radnih grupa ODS koje rade na toj problematici, u velikoj meri eliminisaće probeleme u izboru opreme za ugradnju i nihove dalje eksploatacije. Takođe, na osnovu iznetih iskustava potrebno je uložiti dodatne napore da se postojeća rešenje automatizacije u velikoj meri usaglase sa očekivanim preporukama i tehničkim specifikacijama opreme za automatizaciju.

2. Promena organizacione strukture elektrodistributivnih preduzeća koja sada posluju u okviru jedinstvenog Operatora Distributivnog Sistema (ODS) sa stanovišta upravljanja elektrodistributivnim sistemom, prouzrokuje potrebu da se postojeći centri upravljanja hijarahijski definišu u odnosu na nadležnosti koje su im dodeljene, kao i u odnosu na formirani Nacionalni Dispečerski Distributivni Centara (NDDC). Postojećih centara upravljanja, svih nivoa upravljanja, potrebno je definisati i realizovati na jedinstvenoj platformi, kako bi se dobio željeni optimalni nivo upravljanja elektrodistributivnim sistem na celokupnom konzumnom području ODS.

3. Koordinaciji podešenja parametara zaštitnih uređaja u okviru transformatorskih stanica i opreme za automatizaciju potrebno je posvetiti posebnu pažnju, kako bi se definisale nove preporuke u pogledu izrade Planova podešenja zaštitnih uređaja u elektrodistributivnom sistemu. Predmetnoj aktivnosti je potrebno dati prioritet, jer je u mreži prisutna velika neusaglašenost u podešenju opreme za automatizaciju po distributivnim područjima ODS, što često dodovdi do neselektivnosti delovanja zaštite koja direktno utiče na pouzdanost napajanja krajnjih kupaca.

SESSION 3 - MANAGEMENT AND PROTECTION IN ELECTRICITY DISTRIBUTION

Chairman: Dušan Vukotić, M.Sc.
Subsidiary "EPS Distribucija" d.o.o. Beograd

In SESSION -3, were presented 13 (thirteen) papers and pieces of information out of a total of 15 (fifteen) expert papers, accepted for this year's Conference programme.

After presenting the papers, the following conclusions were drawn concerning several subjects from the field of protection and management in electricity distribution:

1. *Automation in medium-voltage electricity distribution (MVDM) has recently gained full intensity and within the MVDM a comparatively large number of automation equipment has been installed. A great number of papers have actually focused on the experience in the the past utilization of automation equipment and this experience is in many cases identical, but, but there is evidently also a certain amount of heterogeneity in the implementation of certain technical solutions. Activities in defining uniform technical specifications for automation equipment within certain work groups in Distribution Subsidiaries dealing with such issues will, to a great extent, eliminate problems in selecting the equipment for installation and their further utilization. Also, on the basis of the presented experience, it is necessary to make additional efforts in order to comply the existing automation solutions as much as possible to the expected recommendations and technical specifications of the automation equipment.*

2. *Changes in the organizational structure of electricity distribution companies currently operating within a single Distribution System Operator (DSO) from the standpoint of electricity distribution management, calls for defining the existing control centres by hierarchy compared to the entrusted authorization, and compared to the formed National Distribution Dispatch Centre (NDDC). The existing control centres, at all control levels, need to be defined and realized on a single platform, in order to obtain the desired optimal level of electricity distribution control in the overall DSO consumption region.*

3. *Special attention needs to be dedicated to coordination of adjustment parametres for protective devices within the substations and automation equipment, in order to define new recommendations for setting up Plans for compliance of protective devices in electricity distribution. The subject activity needs to be given priority, as there is a great deal of noncompliance in the grid concerning the automation equipment by DSO distribution regions, which frequently results in unselectivity in terms of the effect of protection which has a direct impact on the reliability of supply to the end customers.*

4. Uloga telekomunikacija sa stanovišta realizacije savremenih tehničkih rešenja zaštite i upravljanja u okviru elektrodistributivnog sistema, u poslednje vreme dobija centralno mesto. Bez snažne i razvijene informaciono-telekomunikacione infrastrukture ne može se realizovati optimalni željeni nivo upravljanja, budući da se infrastuktura u tehničkom smislu proteže od procesnog do najvišeg hijerahijskog nivoa upravljanja – centra upravljanja. Budući da se informaciona-telekomuniakciona infrastruktura heterogeno realizovala po pojedinim distributivnim područjima sa vrlo slabom međusobnom koordinacijom u pogledu njenog razvoja, neophodno je uložiti napore da se definiše jedinstveni okvir daljeg razvoja informaciono-telekomunikacione infrastrukture za potrebe jedinstvenog ODS.

4. *The role of telecommunications from the standpoint of implementation of state of the art technical solutions for protection and management within electricity distribution, has recently gained great importance. An optimal desired level of management cannot be realized without a powerful and developed information and telecommunication infrastructure, given that the infrastructure in technical terms ranges from processing to the highest hierarchical level of management – the management hub. Given that the information and telecommunication infrastructure was realized heterogeneously in certain electricity distribution regions with very poor mutual coordination in respect of its development, efforts need to be made in order to define a single framework for further development of the information and telecommunication infrastructure for the purpose of a single DSO.*

Najzapaženiji rad / *the most prominent paper*:

R-3.11 PRORAČUN STRUJE KVARA PRI POJAVI NESIMETRIČNOG OPTEREĆENJA U OKVIRU SNDM GRADA BEOGRADA / *FAULT CURRENT CALCULATION ON THE OCCURRENCE OF AN ASYMMETRICAL LOAD WITHIN THE MVDN OF THE CITY OF BELGRADE*

Goran ŽIVADINOVIĆ, mr Dušan VUKOTIĆ, ODS „EPS Distribucija“ d.o.o. Beograd

STK 4 - DISTIBUIRANA PROIZVODNJA I EFIKASNO KORIŠĆENJE ELEKTRIČNE ENERGIJE

Predsednik komisije: dr Željko POPOVIĆ
EPS Distribucija, Ogranak ED Subotica

1. Integracija distribuiranih izvora električne energije

Stručni izvestilac - dr Predrag Vidović, Fakultat tehničkih nauka, Novi Sad, Srbija

Pored analize uticaja na gubitke i naponske prilike u SN i NN mreži, što je razmatrano u delu prikazanih radova, potrebno je analizirati i uticaj distributivnih generatora na ostale poslovne procese u distributivnim sistemu. Pre svega je potrebno analizirati uticaj distributivnih generatora na proces dugoročnog planiranja razvoja distributivnih mreža, uvažavajući sve relevantne aspekte planiranja (investicione troškove, troškove gubitaka, troškove prekida, veličine struja kratkih spojeva, operativna ograničenja).

2. Efikasno korišćenje električne energije i upravljanje opterećenjem

Stručni izvestilac - Stanko Knežević, dipl.el.inž, Schneider Electric DMS NS, Novi Sad, Srbija

a. U cilju povećanja efikasnosti distributivnog sistema je, između ostaloga, potrebno stalno pratiti ukupne gubitke (tehničke i netehničke) električne energije na svim naponskim nivoima. Da bi se omogućilo kvalitetno praćenje stanja u ditributivnom sistemu i kvalitetna procena gubitaka energije i snage u mreži trebaju se koristiti odgovarajući alati (npr. alate koji omogućuju modelovanje mreže, analizu topologije, estimaciju stanja, proračun tokova snaga) u okviru jedinstvenog sistema za upravljanje distribucijom (DMS-a), koji predstavlja jednu od osnovnih komponenti neophodnih za realizaciju koncepta pametnih mreža (Smart Grids). Navedeni sistem treba da integriše odgovarajuće podatke o svim elementima mreže (npr. iz GIS-a) i što kvalitetnije podatke o potrošnji u potrošačkim čvorovima u mreži (npr. iz AMI/MDM i CIS sistema).
b. Upravljanje opterećem je jedan od važnih alata (procesa) koji se koristi u pametnim mrežama (Smart Grids) u značajnom broju poslovnih procesa (operativno upravljanje u normalnim i havarijskim uslovima, planiranje razvoja mreže). Zboga toga je potrebno, pored koristi koje upravljanje optrećenjem može doneti pojedinačnim kupcima, sagledati i proceniti i koristi koje mogu imati i ostali učesnici (proizvođači električne energije, operatori prenosnog i distributivnog sistema, trgovci na malo i veliko, agregatori). Jedino na osnovu sagledavanja svih koristi, uz uvažavanje relevantnih troškova, se može oceniti efektivnost nekog programa upravljanja opterećenjem.

SESSION 4 - DISTRIBUTED PRODUCTION AND EFFICIENT USE OF ELECTRICITY

Chairman: dr Željko POPOVIĆ
EPS Distribucija, Ogranak ED Subotica

1. Integration of distributed power sources

Expert reporter – Dr. Predrag Vidović, Faculty of technical sciences, Novi Sad Serbia

In addition to analyzing the impacts on losses and voltage variations in the MV and LV grid, which was discussed in some presented papers, it is also necessary to analyze the impact of distribution generators on other business processes in the distribution system. First of all, it is necessary to analyze the impact of distribution generators on the long-term distribution grid development planning process, taking into account all relevant aspects of planning (investment costs, costs of losses, costs of outages, short-circuits values, operative restrictions).

2. Efficient use of electricity in load control

Expert reporter - Stanko Knežević, B.Sc.El.Eng., Schneider Electric DMS NS, Novi Sad, Serbia

a. For the purpose of obtaining higher efficiency in electricity distribution, it is necessary, among other things, to continuously monitor the total electricity losses (technical and non-technical) on all voltage levels. In order to allow quality monitioring of the ste of electricity distribution and quality assesment of energy and power in the grid, appropriate tools need to be used (e.g. tools which allow grid modelling, topology analysis, state estimation, load flows calculation) within a single distribution management system (DMS), which is one of the basic components required for implementing the Smart Grids concept. The above system needs to integrate the correponding data on all grid elements (e.g. from GIS) and the best quality data in the grid consumer nodes (e.g. from the AMI/MDM and CIS systems).
b. Load management is one of the important tools (processes) used Smart Grids in a significant number of business processes (operative management in normal and emergency conditions, grid development planning). That is why it is necessary, in addition to the benefits that load management may bring to some customers, also to perceive and assess the possible benefits for other partiicipants as well (electricity producers, transmission and distribution system operators, retailer and wholesale tradesmen, aggregators). Only by perceiving all the benefits, and taking into account the relevant costs, can the effectiveness of a load management programme be evaluated.

3. Pametna brojila i sistemi za daljinsko očitavanje i upravljanje brojilima

Stručni izvestioci - Boris Holik, dipl.el.inž. i Saša Marčeta, dipl.el.inž., ODS EPS Distribucija, Novi Sad, Srbija

a. Uvođenje naprednih merenja i AMI sistema predstavlja osnovu za razvoj naprednih mreža i doprinosi razvoju otvorenog tržišta električne energije i povećanju efikasnosti rada elektrodistributivnih kompanija.
b. Ubrzati osavremenjavanje merne infrastrukture u skladu sa usvojenim konceptom AMI/MDM sistema.
c. Ubrzati aktivnosti na polju integracije podataka iz AMI/MDM sistema sa ostalim tehnološko – poslovnim procesima unutar poslovanja operatera distributivnog sistema.
d. U cilju efikasnije borbe protiv netehničkih gubitaka električne energije, intenzivirati korišćenje raspoloživih podataka iz AMI/MDM sistema (logovi, dnevnici događaja, alarmi i dr).
e. U uslovima otvorenog tržišta električne energije, u skladu sa relevantnom zakonskom regulativom intenzivirati:
   - Korišćenje osnovnih funkcionalnosti sistema za daljinsko očitavanje brojila, a pre svega korišćenje stvarnih satnih profila potrošnje za potrebe operatora prenosnog sistema (satni profili bazirani na stvarnim podacima o potrošnji, umesto na osnovu standardizovanih dijagrama profila potrošnje).
   - Korišćenje dodatnih funkcionalnosti sistema za daljinsko očitavanje brojila, a pre svega mogućnost pristupa korisnika sistema njegovim podacima i mogućnost pristupa snabdevača električne energije podacima njegovih korisnika

3. Smart metres and remote measuring and control systems

Expert reporters - Boris Holik, B.Sc.El.Eng., and Saša Marčeta, B.Sc.El.Eng., Subsidiary of EPS Distribution, Novi Sad, Serbia

a. Introducing advanced metering and the AMI system are the basis for Smart Grids development contributing to the development of the electricity market and higher operational efficiency in electricity distribution companies.
a. Updating of the metering infrastructure needs to be speeded up in compliance with the adopted AMI/MDM system concept.
b. Activities in the field of integration of data from the AMI/MDM system with other technological and business processes within the business distribution system operator need to be speeded up.
c. For the purpose of higher efficiency in struggling with the non-technical electricity losses, utilization of available data from the AMI/MDM system (logs, log books on events, alarm systems, etc.) needs to be more intensive.
d. In the open electricity market conditions, in accordance with the relevant legislation, the following needs to be intensified:
   - *Utilization of basic system functionalities for remote metering, first of all utilization of real hourly demand profiles for the needs of the transmission system operator (hourly profiles based on real demand data, instead of being based on standardized demand profile diagram).*
   - *Utilization of additional system functionalities for remote metering, first of all, possible access of the system consumers to their data and possible access of the electricity suppliers to their consumers' data.*

Najzapaženiji rad / *the most prominent paper is*:

R-4.03 MODELOVANJE I PRORAČUN KRATKIH SPOJEVA DISTRIBUTIVNIH MREŽA S DISTRIBUIRANIM GENERATORIMA ZASNOVANIM NA TROFAZNIM INVERTORIMA / MODELING AND SHORT-CIRCUIT ANALYSIS OF DISTRIBUTION SYSTEMS WITH LARGE NUMBER OF THREE-PHASE INVERTER BASED DISTRIBUTED GENERATORS

Luka STREZOSKI, Vladimir KATIĆ, Boris DUMNIĆ, Fakultet tehničkih nauka, Novi Sad, Serbia

STK 5 - PLANIRANJE DISTRIBUTIVNIH SISTEMA
Predsednik: Prof. dr Aleksandar Janjić
Elektronski fakultet Niš

U okviru ove stručne komisije, predstavljeno je svih 10 prihvaćenih radova, koji su obuhvatili sve četiri postavljene preferencijalne teme. Stručni izvestioci za pojedine preferencijalne teme bili su Miroslav Dočić, dr Dragoslav Jovanović, Saša Minić i dr Saša Đekić.

ZAKLJUČCI

1. Pri planiranju, proračun tokova snaga je od suštinske važnosti za pravilnu ocenu opterećenja i naponskih prilika u mreži, pogotovu u prisustvu distribuirane proizvodnje. Zbog toga je potrebno primeniti nove načine proračuna tokova snaga u nesimetričnim režimima, uvažavajući različite vrste distribuiranih izvora energije.
2. Ambijentalni i različiti eksploatacioni uslovi utiču na tačnost proračuna tokova snaga u mreži, te u zavisnosti od raspoloživih podataka moraju biti uvaženi u procesu planiranja.
3. Rekonfiguraciju distributivne mreže treba vršiti uvažavanjem svih ograničenja, uz zadovoljenje više kriterijuma i ukupnih troškova u mreži.
4. Povećanje efikasnosti i smanjivanje gubitaka u mreži potrebno je sprovoditi korišćenjem proverenih, ali i novih rešenja (kompenzacija reaktivne energije, povećanje preseka, primena energetski efikasnih tehnologija), i optimizacionih tehnika za minimizaciju ukupnih troškova u sistemu.

SESSION 5 - DISTRIBUTION SYSTEM PLANNING
Chairman: Dr.Aleksandar Janjić
Faculty of Electronics, Niš

In this session, all 10 presented papers,covering all four preferential subjects, were accepted. The expert reporters for some preferential subjects were Miroslav Dočić, Dr. Dragoslav Jovanović, Saša Minić and Dr. Saša Đekić.

CONCLUSIONS

1. *When planning, power flow calculations are of essential importance for accurate assessment of load and voltage conditions in the grid, particularly in the presence of distributed production. For that reason, it is necessary to apply the new ways of power flow calculations in asymmetrical regimes, taking into account different types of distributed energy sources.*
2. *The environmental and different operational conditions have an impact on the accuracy of power flow calculations in the grid and therefore, depending on the available data, they must be considered in the planning process.*
3. *Distribution grid reconfiguration should be done by taking into account all limitations, in compliance with all criteria and total grid costs.*
4. *Higher grid efficiency and lower losses need to be achieved by using tested, as well as new solutions (reactive energy compensation, increased cross-section, application of energy efficiency technologies) and optimal techniques for minimizing the total costs within the system.*

Najzapaženiji rad / *the most prominent paper*:

R-5.03. PRORAČUN NESIMETRIČNIH TOKOVA SNAGA AKTIVNIH TROFAZNIH DISTRIBUTIVNIH MREŽA /
ASYMMETRICAL POWER FLOW CALCULATION OF ACTIVE THREE-PHASE DISTRIBUTION NETWORKS
V. C. STREZOSKI, N. R. VOJNOVIĆ, P. M. VIDOVIĆ, Univerzitet Novi Sad, Fakultet tehničkih nauka Novi Sad, *Serbia*

STK 6 – TRŽIŠTE ELEKTRIČNE ENERGIJE I DEREGULACIJA

Predsednik komisije: Dr Nenad Katić
Fakultet Tehničkih Nauka, Novi Sad, Srbija

Članovi komisije i stručni izvestioci:
Dr Gordan Tanić, Agencija za energetiku Republike Srbije, Beograd, Mr Vladimir Janković, EMS, Beograd, Dr Savo Djukić, Fakultet Tehničkih Nauka, Novi Sad, Srbija

Na komisiji održanoj 29.09.2016. godine u Vrnjačkoj Banji na X savetovanju o elekrtrodistributivnim mrežama prezentovano je i razmatrano šest radova u skladu sa preferencijalnim temama komisije:

- Otvaranje tržišta električne energije i deregulacija elektroprivrede u regionu.
- Metodologije regulacije i iskustva u primeni.
- Mehanizmi i iskustva u radu tržišta električne energije, novi snabdevači i iskustva ugovaranja isporuke sa potrošačima.
- Smart Grid rešenja u uslovima konkurencije na otvorenom tržištu.

Nakon razmatranja radova doneti su sledeći zaključci:

1. Tržište električne energije u regionu je uspostavljeno i na bazi prvih iskustava se radi na daljem unapređenju regulacionih modela, naročuito u oblasti podsticajnih šema.
2. U cilju efikasnijeg poslovanja elektrodistributivnih preduzeća, značajna su istraživanja na uspostavljanju kvalitetnih modela za ocenu efikasnosti i pouzdanosti snabdevanja električnom energijom, što će biti osnov za uspostavljanje podsticajnih modela.
3. Podsticajni modeli će biti usmereni na praćenje, nagrađivanje i penalisanje performansi rada mreže, a u kasnijem periodu na kvalitet servisa i isporuke električne energije.
4. Podrška upravljačko-informacionih sistema i optimizacionih metoda za podizanje efikasnosti upravljanja mrežom je od velikog značaja za dalje unapređenje poslovanja elektrodistributivnih preduzeća na otvorenom tržištu električne energije.

SESSION 6 – DEREGULATION, OPEN MARKET AND UTILIZATION OF ELECTRICITY

Chairman: Dr. Nenad Katić
Faculty of Technical Sciences, Novi Sad, Serbia

Session members and expert reporters:
Dr. Gordan Tanić, Energy Agency of the Republic of Serbia, Belgrade, Vladimir Janković, M.Sc.,EMS, Belgrade, Dr. Savo Djukić, Faculty of Technical Sciences, Novi Sad, Serbia

At the Session held on 29th September, 2016 in Vrnjačka Banja during the 10th Conference on electricity distribution were presented and considered six papers in accordance with the preferential subject of the Session:

- *Opening of the electricity market and deregulation of electricity sector in the region.*
- *Methodologies of regulation and experience.*
- *Principles and experience of electricity markets, new electricity providers and experience in contracting deliveries.*
- *Smart Grid solutions in competitive environment of open electricity market.*

After considering the papers the following conclusions were made:

1. *The electricity market within the region has been established and on the basis of the first experience further steps are underway in order to continue with the improvement of regulating models, particularly in the field of incentive schemes.*
2. *For the purpose of more efficient operation in the electricity distribution companies, significant research work is being done in order to establish high quality models for assessing electricity supply efficiency and reliability, which will be the basis for establishing incentive models.*
3. *Incentive models will be focused on monitoring, rewarding and penalizing grid operation performances, and at a later time on the quality of services and electricity supply.*
4. *Support of management information systems and optimization methods for achieving more efficient grid management is of great importance for impoving the business activities of electricity companies on the open electricity market.*

Najzapaženiji rad / *the most prominent paper*:

R- 6.03
POKAZATELJI POUZDANOSTI I MOGUĆNOSTI PRIMENE PODSTICAJNIH ŠEMA NA POVEĆANJE POGONSKE SPREMNOSTI – STUDIJA SLUČAJA TS 110/35 KV/KV "BEOGRAD 10 – MISLOĐIN" / *RELIABILITY ÍNDICES AND APPLICABILITY OF INCENTIVE METHODS TO IMPROVE AVAILABILITY – CASE STUDY WITH SUBSTATION 110/35 KV/KV "BELGRADE 10 – MISLOĐIN"*
M.MINIĆ, Univerzitet u Beogradu, Ž.MARKOVIĆ, Univerzitet u Beogradu - Elektrotehnički fakultet, EPS Beograd, A.MARKOVIĆ, Agencija za energetiku, Beograd, Srbija

OKRUGLI STOLOVI – PANELI / ROUND TABLES – PANELS

PANEL 1: RESTRUKTURIRANjE ELEKTRODISTRIBUTIVNOG SEKTORA U SRBIJI

Moderator: Andrija Vukašinović (EPSD, Beograd)

Korenite promene elektrodistributivnog sektora u Srbiji su inicirane izmenom zakonske regulative i potpunim otvaranjem tržišta električne energije u skladu sa trendovima koji su prisutni u okruženju sa kojim je naš elektroenergetski sistem povezan. Iako neophodne, ovakve promene, kakve se sprovode u EPS Grupi i njenom elektrodistributivnom delu, su teške, bolne i u mnogim segmentima frustrirajuće. Nikada se ne mogu obezbediti svi uslovi da one proteknu bez trzavica, problema, nesporazuma, sumnji, osporavanja, pa i opstrukcije.

Ipak, opredeljenost poslovodstva EPS Grupe promenama i savremenom pristupu poslovanja, kao i rešenost svih zaposlenih da se prilagode otvorenom tržištu i na njemu zadrže vodeću ulogu, čine ovaj težak zadatak izvodljivim. Restrukturiranje elektrodistributivnog sektora u EPS Grupi ulazi u završnu fazu i biće gotovo tokom sledeće godine.

Reorganizacija i transformacija ODS-a i uprave za Tehničke poslove distribucije u JP EPS se sprovodi u skladu sa odabranim modelom koji proističe iz primera najbolje prakse i izbegava stranputice kojima su drugi prolazili. Pri svemu ovome važnu ulogu imaju Vlada Srbije, nadležno ministarstvo i Agencija za energetiku Republike Srbije, koji bi aktivnim delovanjem trebalo da obezbede da se proces restrukturiranja sprovodi u skladu sa zakonom, sa jedne strane, a sa druge strane nadzorom i unapređenjem regulative stvaraju okruženje za uspešno delovanje energetskih subjekata na tržištu električne energije.

PANEL 1: RESTRUCTURING OF THE ELECTRICITY DISTRIBUTION SECTOR IN SERBIA

Moderator: Andrija Vukašinović (EPSD, Beograd)

Radical changes in the electricity distribution sector in Serbia were initiated by changes in the legislation and the full opening of the electricity market in accordance with the trends existing in the environment with which our electric power system is connected. Although indispensable, such changes enforced in the EPS Group and its electricity distribution part, are hard, painful and in many segments frustrating. Никада се не могу обезбедитиI It is apsolutely impossible to provide such prerequisites which would allow them to go without causing social disturbances, problems, misunderstanding, suspicions, denials,…and even obstructions.

Nevertheless, the EPS Group's orientation towards changes and state of the art avenue to business, and the resolve of all employees to adjust to the open market and preserve a leading role there, make this difficult task viable. Restructuring of the electricity distribution sector in the EPS Group is at the beginning of the final phase which will be completed in the course of the following year.

Reorganization and transformation of the electricity distribution subsidiaries and thus avoiding abberrations where others have passed. An important role here is that of the Serbian Government, the authorized ministry and the Energy Agency of the Republic of Serbia which should, through active participation, ensure that the restructuring process conducted in accordance with the law, on the one hand, and through supervision and improvement of regulations on the other hand, creates an environment for successful operation of the energy entities on the electricity market.

PANEL 2: PROBLEMATIKA SMANJIVANJA NETEHNIČKIH GUBITAKA (NTG)

Moderator: Nikola Milosavljević, dipl.inž.el, EPS Distribucija

Na okruglom stolu predstavljen je deo materijala radne grupe (Modul 4B-Poboljšanje funkcija kontrole netehničkih gubitaka, 4C – Komunikacija i podsticaji i 4D-Eksterna komunikacija) u okviru projekta „Smanjenje netehničkih gubitaka“. Nakon prezentacije panelista doneti su sledeći zaključci:

1. Predlozi za pooštravanje kaznene politike:
   - izmenama i dopunama Krivičnog zakonika RS, propisivanjem *krivičnog dela neovlašćene potrošnje el.en,* sa odgovarajućim sankcijama;
   - izmenama i dopunama Zakona o policiji, predviđanjem posebnih ovlašćenja službenih lica organa unutrašnjih poslova;
   - izmenama i dopunama kaznenih odredbi Zakona o energetici i predviđanje novčanog kažnjavanja za korisnike sistema koji ne prijavljuju promene u pogledu lica koja koriste el. en.
2. ODS treba da nastavi sa ulaganjem protesnih nota predsednicima sudova zbog neujednačene sudske prakse i zbog velikog broja neosnovanih privremenih mera;
3. Aktivnost na IMM se do sada pokazala kao najefikasnija u borbi protiv neovlašćene potrošnje i zato treba nastaviti i težiti da se izmesti što veći broj mernih mesta;
4. Usvajanje tehničkog rešenja u EPS Distribuciji koje bi definisalo ugradnju opreme za alarm i video nadzor u tipskim ormanima mernog mesta moglo bi dodatno da poveća efikasnost u smanjenju gubitaka;
5. Razmena iskustava sa zemljama u okruženju:
   - Poželjno je uspostavljanje redovne saradnje i razmene iskustava u regionu, npr. s ekspertima u oblasti kontrole mernih mesta i otkrivanja neovlašćene potrošnje iz Crne Gore, BiH/Republike Srpske...
   - Inicirati organizovanje tematskog savetovanja samo na temu Smanjenje netehničkih gubitaka električne energije i otkrivanje neovlašćene potrošnje;
6. Inicirati saradnji sa drugim komunalnim preduzećima u cilju detekcije neovlašćene potrošnje (*Infostanom, kompanijama za gas po kome ona obaveštava ODS o novim zgradama priključenim na gasovodnu mrežu i sl).*

PANEL 2: REDUCTION OF NONTECHNICAL LOSSES

Moderator: Nikola Milosavljević, dipl.inž.el, EPS Distribucija

Round table presented part of the material from a working group (Module 4B-Improving control function of non-technical losses, 4C - Communication and incentives and 4D External communication) within project "Reduction of non-technical losses". After the presentation, panelists brought following conclusions:

1. *Proposals for tightening the penalty policy:*
   - *Amendments to the Criminal Code of the Republic of Serbia, by prescribing criminal offense of unauthorized consumption of electricity, with appropriate sanctions;*
   - *Amendments to the Law on Police, by forecasting specific authorization of officials within internal affairs;*
   - *Amending and supplementing the penalty provisions of the Energy Law and anticipation of the fine system for users who do not report changes regarding the persons who use the electricity.*
2. *ODS should continue investing protest note to presidents of courts because of inconsistent law practices and large number of unfounded temporary measures;*
3. *Activity on the IMM has so far proved to be most effective in fight against illegal consumption and therefore the strive to relocate the greatest number of measuring points should be continued;*
4. *Adoption of technical solution in EPS Distribution that would define the installation of equipment for alarm and video surveillance in measuring points standard cabinets could further increase the efficiency in reducing losses;*
5. *Exchange of experiences with neighboring countries:*
   - *It is desirable to establish regular cooperation and exchange of experiences in the region, for example with experts in the field of control of measuring points and detecting unauthorized consumption from Montenegro, Bosnia and Herzegovina, Republic of Srpska ...*
   - *Initiate the organization of thematic meeting only on the subject of non-technical losses of electricity and detection of unauthorized consumption;*
6. *Initiate cooperation with other utilities to detect unauthorized consumption (utilities, gas companies on which the ODS is notified on the new buildings connected to the gas network, etc.).*

PANEL 3: PRAĆENJE POKAZATELJA POUZDANOSTI DEES U ODS EPS DISTRIBUCIJI

Moderator: dr Željko Popović (EPSD, Novi Sad)

Na okruglom stolu je predstavljen materijal radne grupe (Modul 3D – Unapređenje registra prekida) u okviru projekta „Poboljšanje upravljanja mrežom“ koji se radi na nivou JP EPS. Najvažniji zaključci, proizašli iz ovoga materijala i diskusija na okruglom stolu su:

1. Proširiti skup pokazatelja pouzdanosti koji bi se pratio u ODS-u. Predlog je da se pored pokazatelja SAIDI, SAIFI i CAIDI prate i pokazatelji ASUI, ASIFI i ASIDI. Na ovaj način se omogućuje uvažavanje „značaja“ pojedinačnog korisnika sa stanovišta instalisane snage (ASIFI, ASIDI). Predloženi pokazatelji su definisani u standardu IEEE Std 1366™ (2012).
2. Kada se steknu tehnički uslovi u ODS-u pratiće se i pokazatelj MAIFI, čime bi se obuhvatili i kratkotrajni prekidi u napajanju. Takođe, kada se steknu tehnički uslovi, pratiće se i svi prekidi u niskonaponskoj mreži, a do tada će se svi indeksi računati (pratiti) na nivou srednjenaponske mreže.
3. Usvojiti novu kategorizaciju područja/vodova koja omogućuje kvalitetnije međusobno poređenje distributivnih područja po pitanju pokazatelja pouzdanosti, u skladu sa onim definisanim u standardu IEEE Std 1782™(2014). Uvažavajući specifičnosti distributivnih mreža u Srbiji uraditi odgovarajuće prilagođavanje kategorija vodova definisanih standardom.
4. Proširiti kategorije i elemente prekida koji su se do sada pratili u ODS-u kako bi se obezbedilo kvalitetnije/preciznije određivanje uzroka prekida a time i efektnije određivanje najbolje strategije (aktivnosti) za unapređenje pouzdanosti.
5. Za praćenje svih elemenata koji mogu da unaprede kako praćenje pokazatelja pouzdanosti tako i jasan uvid u kompletan proces upravljanja planiranim i neplaniranim prekidima neophodno je definisaniti jedan (softverski) sistem (alat) za upravljanje prekidima (Outage Management System).

PANEL 3: MONITORING DEES RELIABILITY INDICATORS IN ELECTRIC POWER INDUSTRY OF SERBIA DISTRIBUTION DSO

Moderator: dr Željko Popović (EPSD, Novi Sad)

The round table presented the material of the working group (Module 3D - Improving interruption registry) produced within project "Improvement of network management," which is done at the level of PE EPS. The most important conclusions derived from this material and roundtable discussions were:

1. *Expand the set of indicators of reliability that would be followed within ODS. The proposal is that in addition to the indicators SAIDI, SAIFI and CAIDI, indicators ASUI, ASIFI and ASIDI should also be followed. In this way it is allowed for the individual user to be appreciated from the standpoint of the installed capacity (ASIFI, ASIDI). The proposed indicators are defined in IEEE Std 1366™ (2012).*
2. *When certain technical requirements in the ODS are met MAIFI indicators will also be followed, which would encompass short interruptions in the power supply. Also, when technical requirements are met any interruptions in low voltage networks will be followed, while until then will all indexes will be calculated at the level of medium-voltage networks.*
3. *Adopt the new categorization of areas / lines that allows better comparison of each distribution area in terms of indicators of reliability, in accordance with those defined in IEEE Std 1782™ (2014). Taking into account the specificities of distribution networks in Serbia, make appropriate adjustment of categories of lines defined with standards.*
4. *Expand categories and elements of interruptions that have so far been followed in DSO to ensure better / more accurate determination of the causes of interruption and thus determine the most effective strategy (activities) to improve reliability.*
5. *To monitor all elements that can improve both monitoring of reliability and a clear insight into the entire process of managing planned and unplanned interruptions is necessary to define a (software) system (tool) for managing interruptions (Outage Management System).*

PANEL 4: HERMETIČKI ZAPTIVENI TRANSFORMATORI 20 (10) / 0.42 kV U DISTRIBUTIVNOJ MREŽI SRBIJE – KONSTRUKTIVNE ODLIKE I MOGUĆNOST PRIMENE

Moderator: Vladimir Ostraćanin, Elektrosrbija Kraljevo

1. Sa aspekta smanjenja troškova održavanja preporučuje se upotreba hermetički zaptivenih transformatora (HZDT), uz uslov da se obrati dodatna pažnja na karakteristike HZDT koji se nabavljaju;
2. Bitno je definisati opremu koja se koristi kao obavezna kod HZDT, a da izbor opreme (posebno zaštite) bude racionalan shodno opremi u transformatorskoj stanici gde je HZDT ugrađen;
3. Posebnu pažnju je potrebno obratiti i na ispitivanja materijala i opreme od kojih su ovi transformatori napravljeni (dokaz kvaliteta);
4. Obavezno je tražiti tipske ateste za HZDT koji se nabavljaju;
5. Obavezno je raditi pilot projekat u vezi eksploatacije HZDT. U tom slučaju HZDT je obavezno eksploatisati u sledećim uslovima:
   a. Veliko opterećenje transformatora sa povremenim preopterećenjima
   b. Učestale promene opterećenja transformatora
   c. HZDT ugraditi u TS gde se merenje prenosi daljinski, tako da se mogu pratiti dijagrami optrećenja
   d. Učestale promene temperature sa letnjim i zimskim ekstremima
6. Obzirom da Pravila o radu distributivnog sistema ne zabranjuju upotrebu hermetički zaptivenih transformatora (HZDT) potrebno je uskladiti tehničku preporuku koja se bavi karakteristikama transformatora 10/0.4, 20/0.4 i 20(10)/0.4 kV. Navedeno usklađivanje treba uraditi tek nakon završetka pilot projekta u kom bi se beležile karakteristike HZDT tokom eksploatacije i eventualnog pozitivnog stava o primeni istog, koji evidentno za sada nije problematičan.

PANEL 4: HERMETICALLY SEALED TRANSFORMERS 20 (10) / 0.42 kV in DISTRIBUTION NETWORK OF SERBIA - CONSTRUCTIVE CHARACTERISTICS AND THE APPLICATION POSSIBILITIES

Moderator: Vladimir Ostraćanin, Elektrosrbija Kraljevo

1. *From the standpoint of reducing the cost of maintenance is recommended to use a hermetically sealed transformers (HZDT), provided that the extra attention is given to the characteristics of HZDT to be used;*
2. *It is important to define the equipment that is used as mandatory in HZDT, and that the choice of equipment (especially of care) is rational according to the equipment in the substation where HZDT is incorporated;*
3. *Special attention must be paid to the testing of materials and equipment from which these transformers are made (proof of quality);*
4. *Be sure to look for the type certificates for HZDT to be provided;*
5. *Be sure to do the pilot project concerning the exploitation of HZDT. In this case HZDT is required to be exploited in the following conditions:*
   a. *High transformer load with occasional overloads*
   b. *Frequent transformers load changes*
   c. *HZDT to be installed in TS where the measurement is transmitted remotely, so you can monitor load diagrams*
   d. *Frequent changes in temperature with summer and winter extremes*
6. *Since the rules about distribution system does not forbid the use of hermetically sealed transformers (HZDT) it is necessary to harmonize the technical recommendation that deals with characteristics of 10 / 0.4, 20 / 0.4 and 20 (10) / 0.4 kV. These adjustments should be done only after the completion of the pilot project in which HZDT characteristics are recorded during exploitation and possible positive attitude on the implementation of the same, which evidently has not yet been problematic.*

POSLOVNE PREZENTACIJE / BUSINESS PRESENTATIONS

Utorak / *Tuesday*, 27.09.2016

Sala / Hall 1	15:00-15:45	ABB: Prezentacija kompanije / *Company presentation*
Sala / Hall 1	16:00-16:45	Schneider Electric: Prezentacija kompanije / *Company presentation*
Sala / Hall 1	17:00-17:45	Elnos Grupa: Prezentacija kompanije / *Company presentation*
Sala / Hall 2	17:00-17:45	TeleGroup: Najbezbedniji reklozeri za smart grid mreže 21. Veka / *Safest reclosers for smart grid in 21th century* Kako upravljati it resursima i ostvariti bolje poslovne rezultate? Studija slučaja na primeru jp elektromreža srbije / *How to manage resources and achieve better business results? Case study on the example of Serbian power industy*
Sala / Hall 1	18:00-18:45	GE Energy: Prezentacija kompanije / *Company presentation*
Sala / Hall 2	19:00-19:45	Siemens: Prezentacija kompanije / *Company presentation*

Sreda / *Wednesday*, 28.09.2016

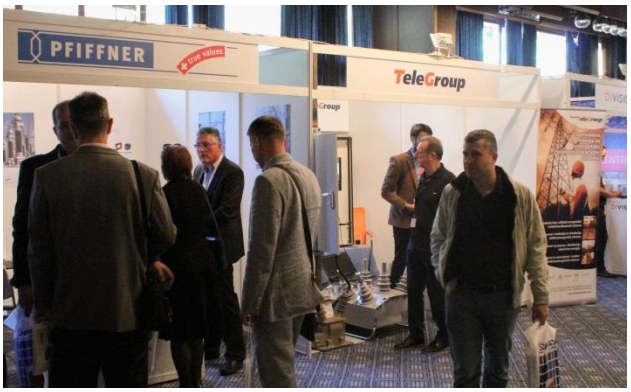
Sala / Hall 1	14:20-15:00	IPS Energy: Prezentacija kompanije / *Company presentation*
Sala / Hall 1	15:00-15:45	Weidmueller: Prezentacija kompanije / *Company presentation*
Sala / Hall 1	16:00-16:45	Institut Mihajlo Pupin: Prezentacija kompanije / *Company presentation*
Sala / Hall 1	17:00-17:45	Minel Trafo: Više od pola veka tradicije i kvaliteta / *More than half a century of tradition and quality*
Sala / Hall 1	18:00-18:45	Elektro-Koil: Prezentacija kompanije / *Company presentation*
Sala / Hall 2	18:00-18:45	Minel Dinamo: Prezentacija kompanije / *Company presentation*
Sala / Hall 1	19:00-19:45	Mitcubishi Electric / Division Visual Solution: Prezentacija kompanije / *Company presentation*

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.

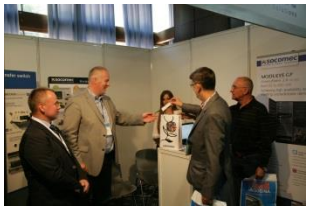


Institut Mihajlo Pupin
Schneider Electric
DMS NS
Schneider Electric
Elnos Group
ABB
General Electric
Siemens
Minel Dinamo
Marti Komerc
Sipronika
Elektroinštitut Milan
Vidmar
Konvereks
Gross
Omicron

ETI B
Fabrika mernih transformatora
Avalon Partners
Weidmuller
SNE Energy
Elektrotehnički institut
DEC
Minel Trafo
Elektro-Koil
SRC Soft
SATURN Electric
Enel PS
Elektromontaža-Roaming
Somborelektro

NHBG Žiks Hard
Geachem
I E D
Feman
Inving Invest
Inžinjering
Socomec
Mitcubishi Electric / Division Visual Solution
Telegroup
PFIFFNER Instrument Transformers
Noark-Electric
Melco Buda
EL-CO
Konvex Electric

Rasina
Tectra
Nidas
Sigmateh
Villbek Kft. Szeged
Vesimpex
IPS-ENERGY.RS
ELTEC Export-Import
Schrack Technik
MICOM TM International
Feromax
Triton Oil / Shell
L'Aqua vita & Raw



DRUŠTVENI PROGRAM / SOCIAL PROGRAM

Svečano otvaranje / *Openning Ceremony*

Svečano otvaranje X Savetovanja muzički je ispratila veličanstvena Lena Kovačević

Nakon što je diplomirala na prestižnom muzičkom konzervatorijumu u Amsterdamu, Lena Kovačević izdala je dva albuma za domaće tržište. Njen muzički stil odiše jedinstvenim spojem pop i džez muzike. Lena se smatra jednim od najvažnijih muzičara nove generacije, karijeru je započela 2004.godine turnejom sa jednim od najboljih orkestara u Holandiji, nastupala je na brojnim festivalima u Evropi. Sarađivala je i nastupala sa Belgijskim producentom Buscemi em (Blue Note) i imala čast da saradjuje sa poznatim kontrabasistom i umetnikom John Clayton. Zajedno sa svojim bendom nastupa širom Srbije i regiona. 2014. godine imala je čast da bude jedan od retkih muzičara koji će nastupati na venčanju teniskog asa Novaka Djokovića.

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 opening ceremony of the X Conference was musically accompanied by the magnificient Lena Kovačević.

Graduated from the Music Conservatory of Amsterdam, Belgrade-born singer-songwriter Lena Kovacevic is one of the most famous musicians of ex-Yugoslavia. She has released two albums, which have acclaimed Lena as one of the leading singers of the new generation. Lena has performed at pop and jazz festivals in Holland, Belgium, Cyprus, Serbia, Montenegro and the region. She has collaborated with producer Buscemi (Blue Note) and performed with some of the best orchestras in Holland. While living in Belgrade she had a chance to perform at many different music halls and venues and partake in various interesting events, including a special appearance at the gala wedding celebration of tennis ace Novak Djokovic.

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.

Siemens veče / Siemens Dinner

Siemens je svoje tradicionano veče organizovao u White Club-u gde je napravio fantastičnu žurku uz pratnju muzičkog sastava.

Siemens has organized its traditional evening in White Club where it has made an excellent party accompanied with the musical performance.

Zajednička večera / *Dinner Ceremony*

Nakon četiri radna dana za sve učesnike kao i organizatore svečana večera bila je prilika za opuštanje i druženje sa starim i novim prijateljima.

After four day working program a dinner ceremony was an opportunity for relaxation and bonding with some old and new firends.