R&D NESTER

14 NL fev 2019

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QUIZ - This specific Quiz deals with concepts related to substations. The definitions have been taken from www.electropedia.org



EDITORIAL

Dear Reader,

Europe is increasingly engaged in the development of an Interoperable Pan-European Electrical Network Services Architecture to serve as an interface between the electrical system (TSO and DSO) and customers, enabling smooth and coordinated operation of all interested parties in the use and acquisition of common services.

This architecture should explore, make use and benefit from leading edge digital tools, such as blockchains and big data management, and offer new opportunities for participation in the electric market, thus engaging consumers in the new market structures, which will be designed to tap Distributed Energy Resources.

For these innovations to materialize and become a reality, the INTERRFACE European Project, started in January 2019, in which R&D Nester participates, addresses precisely these aspects.

Additionally, the ingredient of Flexibility is key in the architecture mentioned above. This flexibility need arises from the fluctuating nature of the increasing amount of generation coming from renewable energy sources, and is supported by the availability of technologies that allow the system and the consumers to react accordingly, e.g., via storage devices, via controlling and managing consumptions in a fast manner, via increased precision on the forecast of generation and consumption, among others.

For these flexibility to be widely and smoothly used, interoperability between manufacturers and devices, and standard procedures for operations and communication (such as IEC61850) are key. Again, the innovation project OSMOSE in which R&D Nester is involved together with other 30+ European partners aims at bringing these innovations to real life, thus making the network operators and other agents fit and ready for the future in an effective and efficient way.

You can read more about these innovation projects and topics below, and about others such as managing critical infrastructures, planning for increased integration of renewables and increased market integration, Global Energy Interconnection, use of IP-MPLS communications for protection of electrical devices, peer-to-peer electricity trading platforms and balancing markets in Europe. Don't forget to test your knowledge on energy trivia with our Quiz below and to follow us on our LinkedIn page (https://www.linkedin.com/company/r&d-nester), where these and other updates are often highlighted.

We hope you find these minutes spent with us both relevant and rewarding.

Enjoy your reading and please continue to share with us your feedback!

Sincerely,

Nuno de Souza e Silva
Managing Director

HIGHLIGHTS

R&D NESTER PARTICIPATES IN INTERRFACE EUROPEAN PROJECT



R&D Nester is partner in INTERRFACE - 'TSO-DSO Consumer INTERFACE aRchitecture to provide innovative grid services for an efficient power system', a project awarded for financing by the European Union under the Horizon 2020 program. H2020 INTERRFACE H2020 project counts with the participation of 42 partners, from 15 countries (Belgium, Spain, Italy, Portugal, Germany, Slovenia, Greece, Finland, Bulgaria, among others), including ENTSO-E, five others ORT, 6 ORD, and several partners from industry.

The project has a duration of four years, starting in 2019 until 2023.

REN is a Consortium member, and R&D Nester it's involved as a third party from REN.

The project INTERRFACE main objectives are:
· Design, develop and exploit the interoperability of a pan-European network service architecture to act as an interface between the TSO and DSO and customers;
· Enable the integrated and coordinated operation of all stakeholders for the use and acquisition of common services.

Project description:

With the growth of renewable energies, the growing interconnection of European networks, the development of local energy initiatives and the specific requirements in TSO-DSO cooperation as set out in different Network Guidelines and Codes, TSOs and DSOs face new challenges that will require greater coordination.

The European Commission has adopted legislative proposals on the energy market that promote cooperation between network operators as they engage in balancing, congestion management and ancillary services.

The measures encourage the acquisition of transmission and distribution services, recognizing that this will allow a more efficient and effective network management and increase the level of demand response and renewable generation capacity.

TSOs and DSOs now have to define the services they wish to acquire in collaboration with market participants and should identify ways of acquiring them in coordination.

Computerization is a key factor for the coordination and active management of the grid system, allowing TSOs and DSOs to optimize the use of distributed resources and to ensure a safe and profitable electricity supply, but also enables end users to become participants market, supporting self-generation and providing flexibility in demand.

To support the transformation, the INTERRFACE project will design, develop and operate an Interoperable Pan-European Network Services Architecture to serve as an interface between the electrical system (TSO and DSO) and customers, enabling smooth and coordinated operation of all interested parties in the use and acquisition of common services.

Leading edge digital tools based on blockchains and big data management will offer new opportunities for participation in the electric market, and thus engage consumers in the market structures proposed by INTERRFACE, which will be designed to tap Distributed Energy Resources.

These European project will develop the following Work Packages:
· WP1: Project Management and Quality Assurance
· WP2: SOTA (State-of-the-Art) Analysis/Assessment and End-user requirements
· WP3: Services and Market Design - INTERRFACE Architecture
· WP4: INTERRFACE IT platform development/ integration
· WP5: Pilot Deployment, demonstration and Evaluation - demo Area 1 (congestion management)
· WP6: Pilot Deployment and Evaluation - demo Area 2 (peer-to-peer trading)
· WP7: Pilot Deployment and Evaluation - demo Area 3 (pan-EU clearing market)
· WP8: Business Opportunities - cascade funding
· WP9: Exploitation, Dissemination & Communication

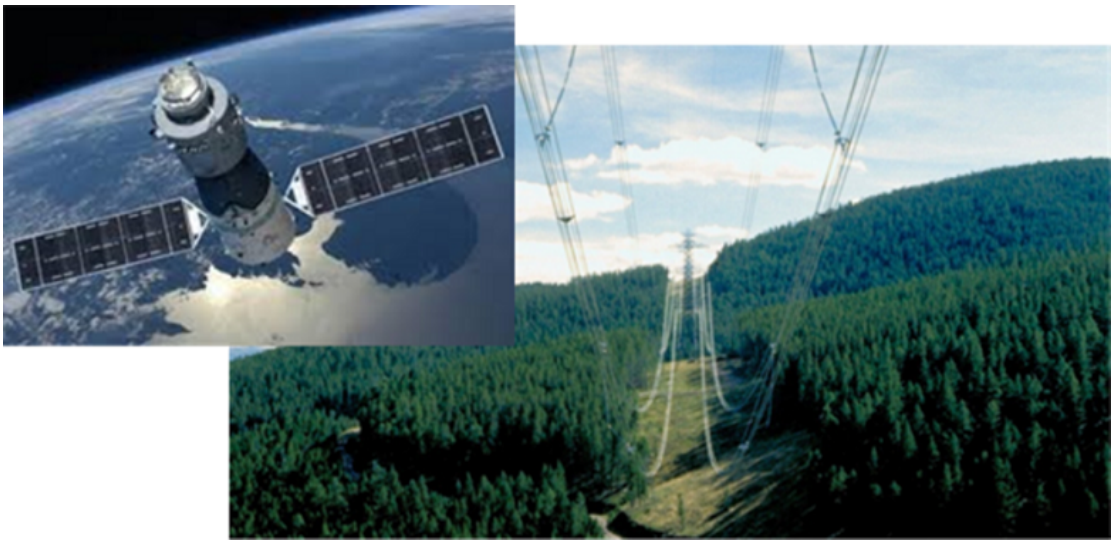
From these 9 Work Packages, REN and R&D Nester will contribute mainly on WP2, WP3 and WP9.

R&D Nester and REN were present in the recent kick-off meeting of the European project. The event happened on 16 and 17 January in Brussels. The meeting intended to initiate the activities of INTERRFACE, bringing together project's partners.

For more info http://www.rdnester.com/en-GB/fields_and_projects/projects/project_23___interrface/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824330

R&D NESTER / REN WIN NEW PROJECT WITH EUROPEAN SPACE AGENCY (ESA)



Following the proposal submitted in May 2018 to the Tender "Services Supporting Critical Infrastructure", the European Space Agency (ESA) confirmed the approval and decision to finance the project entitled "Space-based services to support Resilient and Sustainable Critical Infrastructure" (RESUCI).

The project proposal was submitted by R&D Nester, together with the company GMVIS SkySoft, and with support from REN as end user and stakeholder.

ReSuCI delves with the technic-economic analysis of using satellite information to develop three decision-support services to (i) monitor right-of-way for obstacles and activity detection, (ii) manage and control field management operations and (iii) assess landslide risk. The project duration is nine months.

Close cooperation between R&D Nester, REN teams and GMV started in November 2018.

The Kick-off meeting held last November established the ground zero of the project activities, but the close cooperation between the consortium and stakeholders proceeds since the proposal phase.

Following the Kick-off meeting with ESA, R&D Nester organized the first stakeholders meeting with REN. This working session delved with the definition and requirement analysis of space-based decision support service for right-of-way monitoring.

More information here.

R&D NESTER PARTICIPATES IN OPTIGRID PROJECT



R&D Nester is co-promotor in the OptiGRID project, which main objectives are the development of an operational tool and a methodology using Dynamic Line Rating to facilitate an increase of RES integration in the power system and to reduce the number of separation hours of markets.

R&D Nesters' main contribution for this project englobes an analysis to real power systems, analysis to the interchange capacity (import and export) available between markets and its bids on the intra-day and day-ahead markets, analysis to case studies with different scenarios (region with wind distributed generation, region with solar distributed generation, market splitting scenario) and analysis to the improvements obtained with the use of the developed tool in this project.

This project is a partnership between R&D Nester and LNEG, with a duration of 36 months, starting in end of 2018 and finishing in 2021.

The project is financed by the P2020 program.

More information here

R&D NESTER PUBLISHES WORK ON TOOL FOR GRID PLANNING STUDIES



RD Nester published a scientific paper related to a software tool that allows to calculate the reception capacity of an electric grid. This tool developed by R&D Nester team, is designed to support grid planning studies and aims at obtaining optimized solutions to maximize the nodal capacity to receive new energy sources without jeopardizing the operational security of the grid.

The paper was published in the first edition of the SEST Conference, which main focus was on smart grids and intelligent power systems. The conference occurred between the 10th and 12th of September in Seville, organized by the University of Seville and sponsored by Endesa and IEEE.

The conference has gathered multiple experts in intelligent power systems and smart grids, from different sectors including universities, research centres, industry and national and international authorities. Six plenary sessions have taken place, focusing in hot topics in power systems such as: smart technologies for massive integration of renewable energy, resiliency, energy storage and grid codes. Additionally, it also took place a panel session under the scope of the European project Integrid and a technical session related to two different research projects leaded by Endesa, complementing a total of 22 sessions for presenting scientific papers and results.

For more information and contacts: www.rdnester.com

R&D NESTER PRESENTS A METHODOLOGY TO EVALUATE THE WAVE ENERGY POTENTIAL, DEVELOPED IN H2020 BIGDATAOCEAN PROJECT

BIG DATA OCEAN

R&D Nester presented a scientific paper related to the work that has been being developed under the scope of the BigDataOcean project, in which R&D Nester is a consortium member.

The presented paper describes a methodology to evaluate the potential of wave energy and to verify the effect that the resource variability might have in the production of electric power. This methodology can be used through the utilization of the BigDataOcean platform.

This project is financed by the European Commission through H2020 and has a total of 10 European partners, allowing users to execute services related to the maritime landscape including services related to wave energy assessment studies.

All information related to BigDataOcean can be accessed in the project webpage at www.bigdataocean.eu. Additionally, R&D Nester team can also provide further information on what services are already available or envisaged to be included in the platform.

This paper was presented at the SEST - International Conference on Smart Energy Systems, which main focus was on smart grids and intelligent power systems. The conference, organized by the University of Seville and sponsored by Endesa and IEEE, occurred between the 10th and 12th of September in Seville and gathered multiple experts in intelligent power systems and smart grids, from different sectors including universities, research centres, industry and national and international authorities. Six plenary sessions have taken place, focusing in hot topics in power systems such as: smart technologies for massive integration of renewable energy, resiliency, energy storage and grid codes. Additionally, it also took place a panel session under the scope of the European project Integrid and a technical session related to two different research projects leaded by Endesa, complementing a total of 22 sessions for presenting scientific papers and results.

Facebook: https://www.facebook.com/bigdataocean
Twitter: https://twitter.com/big_data_ocean
RDNester: http://www.rdnester.com/en-GB/fields_and_projects/projects/project_9__bigdataocean/

R&D NESTER HOSTS PLENARY MEETING OF EUROPEAN H2020 PROJECT BIG DATA OCEAN



R&D Nester was responsible for the organization of a plenary meeting of the BigDataOcean project, from which is a member of the consortium. The meeting took place in Sacavém, on the 20th and 21st of September and all consortium partners of this H2020 project were represented. The meeting had the main objective of checking the current state of all project activities and defining the strategy for the tasks to be performed in the upcoming months by all partners.

The main activity going on in the project is related to the optimization of the Big Data platform, which is already functional and is currently being tested by the consortium and external partners that showed interest in following the project activities. This platform will be released to the general public till the end of the year and will already include services related to the assessment of the potential of wave energy, implemented by R&D Nester with the collaboration from different consortium partners and also partners external to the consortium but with a great importance in order to improve the quality of offered services, such as ENONDAS.

With the participation in this project, R&D Nester continues to develop skills and know-how related to data processing and related techniques and algorithms, which brings added value and refers to a growing need considering the current context of power systems.

All project information can be accessed at the website: www.bigdataocean.eu.
Additionally, any person interested can already have access to the platform to test and see existing services.

R&D NESTER HOSTS MEETING OF OSMOSE H2020 EUROPEAN PROJECT (“OPTIMAL SYSTEM-MIX OF FLEXIBILITY SOLUTIONS FOR EUROPEAN ELECTRICITY”)



R&D NESTER hosted the meeting of the team that participates in the 'interoperability' task of the OSMOSE European project, which took place at its Sacavém facility, on the 1st and 2nd of October 2018. This project aims to study the application of flexibility solutions for the optimal integration of renewable energy sources and the demonstration of technological solutions and innovative flexibility services in electric energy systems, such as energy storage systems.

In particular, the task of 'interoperability', involving R&D NESTER researchers Ricardo Cartaxo, João Saragoça and Nuno Amaro, has the purpose of producing a demonstrator to prove the correct operation of a system consisting of IEDs (intelligent electronic devices) from different manufacturers, communicating according to IEC 61850, which defines communications in power systems, having interoperability as its first objective.

Since the results of this task are expected to be disseminated to IEC 61850 stakeholders, the leader of the IEC 61850 working group of ENTSO-E (Grégory Huon) and the responsible for the edition of IEC 61850 and other standards related issues (Christoph Brunner) are part of the team.

Thus, this task is being developed in coordination with the mentioned working group, which objective is the improvement of the standard, both in terms of the data model of the devices and the respective configuration process. R&D NESTER plays a central role in this task, as the demonstrator will be installed in its laboratory in Sacavém. This demonstrator will simulate two substations, connected by a transmission line, each one having a storage system, which objective will be to minimize the possibility of occurrence of overloads in the line.

The installation of the demonstrator and the respective tests will take place during next year, having the team felt the need to carry out preliminary tests, at software level, which resulted in the schedule of this meeting. In addition, it was also essential for the team to have contact with the laboratory, for a better planning of future actions, fact that defined the location of the meeting.

In this meeting, the team also reviewed some of the deliverables, as well as the next tasks to be performed.

REN is also a partner in this project, which counts with the participation of several entities such as RTE (French TSO), Elia (TSO Belgian), REE (Spanish TSO), Efacec, Siemens, ENTSO-E, among others.

https://www.osmose-h2020.eu/

RDNester: http://www.rdnester.com/en-GB/fields_and_projects/projects/project_19__osmose/

R&D NESTER CONTRIBUTES TO INTERREG EUROPEAN PROGRAM IN THE SCOPE OF ARCWIND PROJECT

R&D Nester, REN and ENONDAS participated in an international workshop whose main topic was on floating offshore wind energy.

This workshop took place in Lisbon, on the 10th of October. It was organized by Instituto Superior Técnico, in the scope of the ARCWIND project, funded by the INTERREG Atlantic Area programme, and in which R&D Nester is a consortium member and REN and ENONDAS are stakeholders.

The workshop had an active participation of multiple entities related to offshore wind energy, focused in floating solutions, and included presentations from an European Commission JRC, from DNV-GL and from two promotors of floating platforms for offshore wind energy (SAITEC and ESTEYCO), among others.

The topics addressed included the presentation of multiple solutions related to floating offshore wind technologies including the design of innovative platform, showcasing of new materials whose characteristics make them interesting to be used in offshore solutions and solutions to monitor offshore equipment.

Finally, and because this is a core topic to the development of floating offshore solutions, different funding opportunities at an European level and the trends in research topics were also presented.



R&D Nester also participated in a plenary meeting of the ARCWIND project, which is funded by INTERREG Atlantic Area and which main goal is to contribute to the development of floating offshore wind technologies. The meeting, which was organized by Instituto Superior Técnico, took place in Lisbon on the 11th and 12th of October, and had representatives of all consortium members, which come from the five countries inside the European Atlantic Area (Portugal, Spain, France, United Kingdom and Ireland).

ARCWIND project aims to contribute to the development of floating offshore wind solutions and has multiple partners, which are experts in the involved areas, from the resource assessment until the design and prototype testing of floating platforms including also the evaluation of the economic viability of projects and monitoring of offshore systems.

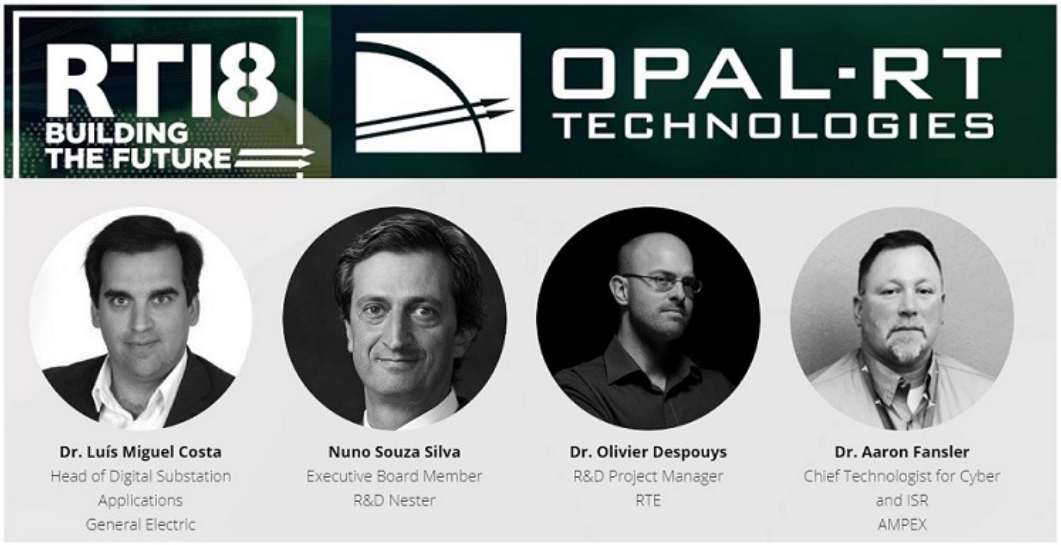
The main task of R&D Nester is related to the study of the impacts that the installation of these technologies could have in the electric grid, through the study of the capacity that the grid has to receive new generation sources and the impact that these new sources might have in the grid operation and identify possible needs for grid reinforcements. These studies are performed for the multiple areas identified has having more energy potential, in the five countries under study.

Through an active participation in this project, R&D Nester contributes to the planning of the introduction of floating offshore wind energy. This is of upmost importance since this is one of the solutions foreseen for the next years in order to improve the quota of renewable energy in the generation mix at a European level, particularly in regions with a high depth, like the Atlantic Ocean, where fix offshore wind is not a viable solution.

All project details can be accessed at: www.arcwind.eu.

RDNester: http://www.rdnester.com/en-GB/fields_and_projects/projects/project_15__arcwind/

R&D NESTER KEYNOTE SPEAKER AT THE “OPAL-RTS 10TH INTERNATIONAL CONFERENCE ON REAL-TIME SIMULATION”



Last year Conference "OPAL-RTs 10th International Conference on Real-Time Simulation" was held in November at Paris. R&D Nester was Keynote Speaker at the event.

Nuno Souza e Silva, Managing Director of R&D Nester addressed the theme "Challenges for the Power Sector in the 21st Century - From energy trends to real-time simulation".

With a particular focus on the electric sector, the event had on the agenda topics such as "Power Systems Simulation", "Microgrids & Cybersecurity", "Power Quality Challenges", "Power System Control", "HVDC applications", among others.

The event also featured presentations by French and Brazilian operators, RTE and ONS respectively, as well as manufacturers such as GE.

More information here

ACTION PLAN OF GLOBAL ENERGY INTERCONNECTION TO PROMOTE THE IMPLEMENTATION OF THE PARIS AGREEMENT" RELEASED AT COP24



R&D Nester was present at the COP24 and attended the GEIDCO (Global Energy Interconnection Development and Cooperation Organization) event where the report "Action Plan of Global Energy Interconnection to Promote the Implementation of the Paris Agreement" was released.

The Action Plan puts forward the goals, plan and roadmap of Global Energy Interconnection (GEI) development. Altogether, Ten Actions and Five Cooperation Mechanisms are proposed based on the status quo of the economic, social, energy and power development in different continents.
The Ten Action include concept promotion, clean development, universal access to electricity, power grid interconnection, electricity replacement, smart grid, energy efficiency enhancement, innovation driven, capacity building and policy support.

The Five Cooperation Mechanisms include global power grid planning, transnational project construction, global electricity trade, interconnected power grid coordination and collaboration in technical standards.

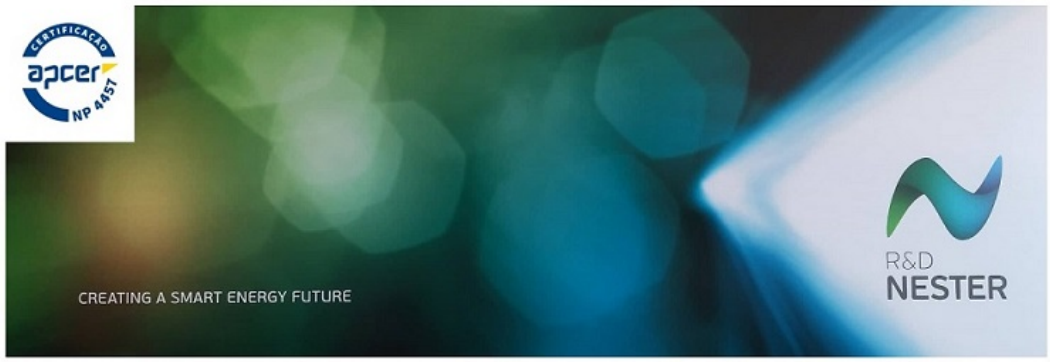


The theme of the event was "Building Global Energy Interconnection, Promoting the Implementation of Paris Agreement".

In the same event there was the Opening Ceremony of the Think Tank Alliance for GEI (Global Energy Interconnection).

The event counted with the presence of Mr. Ovais Sarmad, Deputy Executive Secretary of UNFCCC, Mr. Liu Zhenya, Chairman of GEIDCO and Sir. Philip Lowe, Executive Chair of World Energy Trilemma, World Energy Council.

R&D NESTER OBTAINED THE RENEWAL OF ITS CERTIFICATION IN RDI



R&D NESTER obtained the renewal of its certification in RDI (Research Development and Innovation) by the Portuguese Standard 4457:2007, for a further period of three years, as a result of the audit conducted by APCER - Portuguese Certification Association at the end of the previous year.

Notice that R&D Nester obtained the certification in RDI for the first time on December 2015, meaning the recognition of its Management System for Research, Development and Innovation (SGIDI), according to NP 4457: 2007.

Focusing on the management of RDI activities in an efficient and effective manner, in order to achieve innovative results and consequently create value for R&D Nester and for its shareholders, the current RDI management system is supported on three key processes: i) capture and evaluation of ideas, ii) knowledge sharing and iii) development of RDI projects in house or in partnership with external entities.

The participation and commitment of all the R&D NESTER team have been fundamental for the success of each of these key processes and consequently for system operation as a whole.

The renewal of this certification in RDI "recognizes the existence in R&D NESTER of an organizational culture where innovation is not just about new technology, but also on the processes and organizational models that aim to support the management of cross-cutting activities behind a dynamic of all research, development and Innovation ".

TECHNICAL INFORMATION

PROT.MPLS PROJECT R&D NESTER AND REN TEST LINE DIFFERENTIAL PROTECTION AND TELEPROTECTION OVER AN IP/MPLS COMMUNICATION NETWORK





R&D Nester laboratory, testing rack with line protection relays

In transmission grids, the differential protection and the distance impedance protection together with teleprotection schemes (PUTT, POTT, POTT+WEI,...) are the backbone of the protection system for transmission lines. They are able to assure a quick acting and selective fault protection. Both differential function and teleprotection schemes require real-time wide area communication between both ends of the transmission line, which requires a robust communication network backbone, with redundancy and resilience to network errors, ensuring uninterrupted communication between both ends.

Nowadays, SDH (synchronous digital hierarchy) networks are widely used in transmission grids, being a robust, easy maintenance, easy to configure technology, which conforms to the tight specifications of protection functions, and work seamlessly with protection devices (relays or teleprotection communication devices). SDH ensures a deterministic communication, that is, the travelling time of the data packets are known.

This technology, however, is on its way to obsolescence, with telecommunication device manufacturers discontinuing their production and support in a mid-term future, focusing their efforts instead in more modern and adaptable technologies, such as IP-based networks. However, as these technologies are not deterministic, there are doubts on their applicability to protection functions.

Taking this in mind, network operators are preparing themselves for the future, in which SDH networks may cease to exist to give way for newer technologies, which cannot compromise the dependability of their protection system, by assessing the applicability of IP-based communication to protection systems.

To do so, REN and R&D NESTER are working on a project, to test the performance and dependability of the line differential and teleprotection functions, in which the wide area communication connecting the protection relays at both ends of the transmission line is achieved through an IP/MPLS network.

The objective of this project is to reach a solution that can be implemented in the future, assuring the performance of the protection system, in line with or better than the implemented today and, very important, scalable to the whole transmission grid and allowing for a gradual implementation.

For this project, a two-fold testing platform was built. R&D NESTER, in its laboratory, making use of its RTPSS (Real Time Power System Simulator, simulating the power system) and network testing equipment, prepared a test bed with three models of differential relays, from three manufacturers, allowing to efficiently run closed-loop tests in an automated way. These relays are those used by REN in its substations.

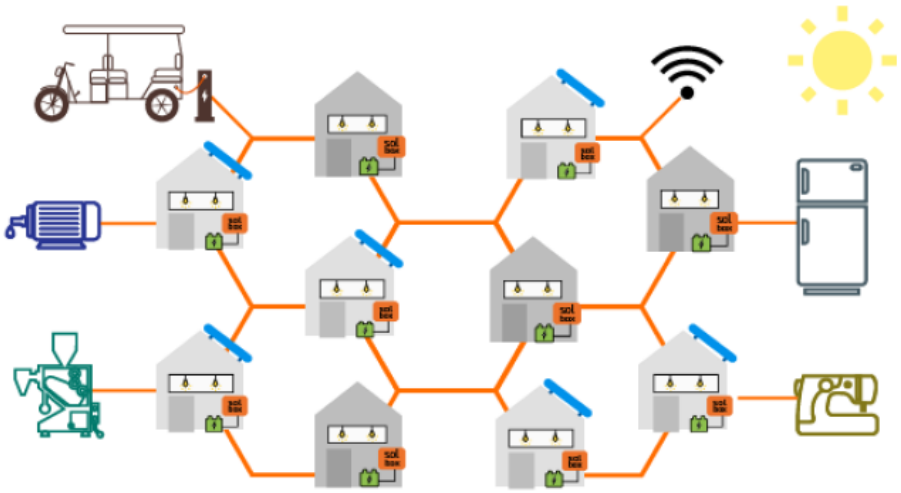
The communication setup of these tests was also prepared, implementing both SDH and IP wide area networks, using real fiber optics in the guard lines between the laboratory site and two of its substations.

In terms of communication network setups, three scenarios have been designed. Scenario 1 consists of a SDH network, configured similarly to the one actually used today, to be used as a baseline for performance validation. Scenario 2 corresponds to a transition scenario from the first to the third scenarios, in which part of the network is SDH, and part of it is IP/MPLS. Finally, scenario 3 is a purely IP/MPLS network, and pretends to emulate the future network, as it will be configured for real applications.

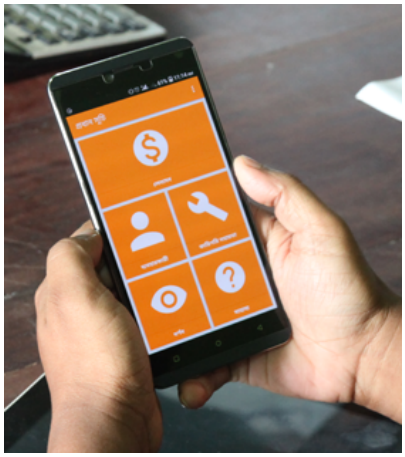
Currently, having concluded a majority of the tests, the results for IP/MPLS implementation are promising, both performance wise and in the scalability of the solution. The IP-MPLS network showed to be a robust solution that can withstand traffic congestion without performance implications for the protection functions. REN and R&D NESTER will be doing further testing in order to gauge the resilience of this solution.

PEER-TO-PERR TRADING PLATFORM FOR SOLAR ELECTRICITY HOME SYSTEMS

SOLshare has developed the world's first peer-to-peer solar electricity trading platform that leverages existing solar home systems (SHS) in an off-grid context to create a bottom-up smart grid.
The SOLbox is our direct-current (DC) bi-directional power meter, solar charge controller and machine-to-machine (M2M) communications enabled end-user device that functions as an individual node of the electricity trading network.



The plug-and-play nature of the SOLbox allows the trading network to grow dynamically from the 'bottom-up' as more users connect over time. Our ICT back-end (SOLweb - our PAYG and grid management portal and SOLapp - our payment and user management Android application, and integration with local mobile money providers) facilitates secure peer-to-peer electricity trading between users; integrating mobile money payment, data analytics and grid management services.



This cooperative initiates, allows small consumers to convert the excess of solar power during the day in local currency, that other consumers can buy using the mobile phone. They share the use of the local distributed network, maximizing the solar production and so minimizing the power from fossil fuel (normal in development countries).

https://www.me-solshare.com/how-it-works/
https://www.edp.com/pt-pt/noticias/2018/09/27/edp-investe-em-startup-que-leva-eletricidade-a-zonas-isoladas-do-bangladesh

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LITERATURE REVIEW

ELECTRICITY BALANCING IN EUROPE

publication available here





European Network of Transmission System Operators for Electricity

entsoe

EVENTS

19 -20 Mar 2019

TUCSON, ARIZONA

2019 SPRING INDUSTRY CONFERENCE, HYDROPOWER & STATIONS

2 -3 Apr 2019

OSLO, NORWAY

R&D CONFERENCE 2019 CONTRIBUTION TO NORWEGIAN, NORDIC AND EUROPEAN ENERGY SYSTEM TRANSFORMATIONS

15 -16 Apr 2019

MILAN, ITALY

FUTURE SOLAR ENERGY SUMMIT

13 -14 May 2019

BRUSSELS, BELGIUM

2019 INNOGRID2020+ CONFERENCE

3 -6 Jun 2019

MADRID, SPAIN

CIRED - 25TH INTERNATIONAL CONFERENCE AND EXHIBITION ON ELECTRICITY DISTRIBUTION

26 -30 Aug 2019

BUDAPEST, HUNGARY

ISH2019 CONFERENCE INTERNATIONAL SYMPOSIUM ON HIGH VOLTAGE ENGINEERING

9 -11 Sep 2019

OPORTO, PORTUGAL

SEST 2019 2ND INTERNATIONAL CONFERENCE ON SMART ENERGY SYSTEMS AND TECHNOLOGIES

31 -4 Oct /Nov 2019

SINGAPORE

30TH ASSEMBLY OF ADVANCED MATERIALS CONGRESS "ENERGY STORAGE TECHNOLOGIES"

LINKS

Some useful links:
ON RESEARCH, DEVELOPMENT AND INNOVATION

Portugal:

- Portugal 2020
- Programa Operacional Competitividade e Internacionalização (COMPETE 2020)
- Agência Nacional de Inovação
- COTEC Portugal

Europe:

- Energy Research Center of the Netherlands (ECN)
- European Energy Research Alliance (EERA)
- Horizon 2020
- Nordic Energy Research
- JRC Publications - Joint Research Centre - Smart Electricity and Interoperability
- ETIP SNET - European Technology and Innovation Platform Smart Networks for Energy Transition
- European Space Agency

Rest of the World:

- American Energy Innovation Council (AEIC)
- China Electric Power Research Institute (CEPRI)
- Electric power research institute (EPRI)

OTHER ORGANIZATIONS

Portugal:

- Laboratório Nacional de Energia e Geologia (LNEG)
- Polo de Competitividade e Tecnologia da Energia (EnergyIn)
- Associação de Energias Renováveis (APREN)

Europe:

- European Network of Transmission System Operators for Electricity (ENTSO-E)
- The European Wind Energy Association (EWEA)
- World Wind Energy Association (WWEA)

Rest of the World:

- CIGRE - International Council on Large Electric Systems

QUIZ

1) NORWAY IS ONE OF THE LEADING COUNTRIES IN SALES OF ELECTRIC VEHICLES. IN 2018, EV'S REPRESENTED WHICH PERCENTAGE OF ALL CAR SALES IN THIS COUNTRY?

- a) 12.2 %
- b) 24 %
- c) 31.2 %
- d) 48.9 %

2) MARCH 2018 REPRESENTED A NEW ACHIEVEMENT IN THE PORTUGUESE POWER SYSTEM. IN THIS MONTH, ENERGY PRODUCED FROM RENEWABLE SOURCES WAS (IN AVERAGE) ENOUGH TO FEED WHICH SHARE OF THE LOAD?

- a) 75 %
- b) 80 %
- c) 90 %
- d) 100 %

3) IN MARCH 7TH 2018, THE PORTUGUESE POWER SYSTEM REACHED A NEW MAXIMUM VALUE FOR ELECTRIC ENERGY GENERATION. WHAT IS THE MAXIMUM POWER GENERATED DURING THIS DAY?

- a) 9240 MW
- b) 12043 MW
- c) 14726 MW
- d) 16138 MW

4) IN 2018, PRODUCTION FROM RENEWABLE ENERGY SOURCES WAS ENOUGH TO FEED 52% OF THE PORTUGUESE LOAD. WHICH RENEWABLE ENERGY SOURCE HAD THE HIGHEST SHARE IN THIS RENEWABLE GENERATION, TOTALIZING 23 % OF THE LOAD?

- a) Wind
- b) Hydro
- c) Wind and Hydro with the same percentage
- d) Solar

5) IN JANUARY 10TH 2018, THE FRENCH TRANSMISSION SYSTEM OPERATOR RTE DECIDED TO PERFORM A LOAD SHEDDING DUE TO A DROP IN THE SYSTEM FREQUENCY, WHICH IS STILL UNDER INVESTIGATION. WHAT WAS THE AMOUNT OF LOAD THAT WAS REDUCED IN THIS EVENT?

- a) 750 MW
- b) 1000 MW
- c) 1500 MW
- d) 2000 MW

6) IN 2021, THE EUROPEAN COMMISSION WILL RELEASE A NEW R&D PROGRAMME NAMED HORIZON EUROPE, REPLACING HORIZON 2020. THIS NEW R&D PROGRAMME IS GOING TO TAKE PLACE FROM 2021 TILL 2027 AND IS, ACCORDING TO THE COMMISSION, THE MOST AMBITIOUS EVER RELEASED. WHAT IS THE TOTAL ENVISAGED BUDGET FOR HORIZON EUROPE?

- ○ a) 75 Billion Euros
- ○ b) 90 Billion Euros
- ○ c) 95 Billion Euros
- ○ d) 100 Billion Euros

Correct answers will be provided to you soon.
If you have problems answering this quiz, click here to answer this via browser.

Answers of the Quiz

1. Answer: c) 31.2 %
2. Answer: d) 100 %
3. Answer: b) 12043 MW
4. Answer: c) Wind and Hydro with the same percentage
5. Answer: c) 1500 MW
6. Answer: d) 100 Billion Euros

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