

EXECUTIVE SUMMARY

Session 3: Operation, Control and Protection

SUMMARY

For CIRED 2019, nearly 450 abstracts have been received in Session 3 showing the still enormous need of further development in the area of operation, control and protection of distribution grids. Due to this record number of abstracts, Session 3 Team had to be stricter than ever in rejecting papers. Since the quality of abstracts and full papers has been constantly increasing during the last years, even well written abstracts had to be rejected in order to keep a manageable number of papers during the conference. Therefore 180 authors –about one third of the proposals– were asked to submit a full paper. Finally, 156 full papers have been accepted by National Committees and the Session 3 Team.



Session 3 Team:
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See you all in Geneva 2021!

MAIN SESSION 3 - BLOCK 1/2

Operation

The topics of Operation were covering a wide area starting from maintenance and condition assessment. Highlights of this block were the presentations on using Augmented Reality in grid operation applications. For maintenance strategies the use of artificial intelligence, data analytics and IOT was reported. In the field of Distribution Management the central question addressed was, how to create additional use-cases for smart meters. For example grid monitoring, topology and phase detection have been proposed. Related to the topic Crisis management several contributions reported about improvements of prognosis of weather and even prognosis on faults expected to be used for best preparedness with human and material resources. Some papers were discussing the more and more important subject of coordination between DSO and TSO, ICT-tools and interfaces pointing out the importance of common standards. Most of the Papers regarding ancillary services were presenting flexibility used to avoid congestion instead of reinforcement of lines. Also in the field of reactive power provision, the majority of papers focused on congestions due to voltage violations. Enhanced concepts of voltage-var control, combined with optimized power flow as well as technical and economic performance were discussed.

The real highlight of this block was the last contribution from two “elder statesmen” from the Netherlands complaining the more and upcoming problem of lack of expert-knowledge at DSOs, but at the Vendors side, too. This led to a controversy, but fruitful discussion about over-specification and oversized international standardisation. Finally, everyone agreed that well-educated and experienced engineers were needed in the past and will be needed in the future, too.

MAIN SESSION 3 - BLOCK 3

Control

Most of the Control-papers were dealing with automation of medium and low voltage networks followed by communication and islanding. In the field of LV- and MV-Automation and even Self-healing grids most DSOs haven been carrying through pilot projects, but still we are far away from a roll-out of such systems as a standard. Islanding is an upcoming subject, which will for sure gain more attention after the next large

blackout. The number of papers on SCADA and distribution automation topics has decreased since the last CIRED conference in Glasgow.

MAIN SESSION 3 - BLOCK 4

Protection

The block Protection covered the topics Fault Location, Earth Faults, Applications, Algorithms and Simulations. New developments and improvements of protection functions as well as methods how to detect faults easier and more reliable were discussed in several papers. The upcoming communication technology 5G –as a new topic– could be a part of protection-functions in the future, but IT-security will be a big issue. Also very interesting were the results of practical field-tests and investigations of protection in the MV- and LV- network.

ROUND TABLE 2

Single Line Faults and Earthing

The Round Table addressed the “never ending story” of single line fault detection and localisation. After decades of research and experiences, several different more or less good solutions have been developed, depending on the neutral point treatment. But still there is no final or best solution covering each fault situation, so there is still research work to do to be presented and discussed during the next CIRED. ☺

ROUND TABLE 4

DSO/TSO Interactions

All participants from the DSO- as well as from the TSO-side agreed in the fact, that the role of DSOs is becoming more and more important since in the future most of the generation capacity will be on distribution level. So sooner or later the DSOs have to take at least partly responsibility for all system services, therefore DSOs and TSO should cooperate on eye-level. Optimising the system as a whole leads to lowest overall costs for the customer, but is difficult to achieve with different ownership of DSO and TSO.

ROUND TABLE 6

Grid Operation 2030 – Digitalisation of Distribution System Operation

The general statement of all participants was that digitalisation offers great new possibilities to the grid operators in the field of grid control and operation, but on planning, too. Upcoming IT-security problems seem to be solvable. Involving the private and industrial customers is necessary in order to overcome their data security concerns.

RESEARCH & INNOVATION FORUM SESSION 3

The RIF gave an overview about all more scientific paper of Session 3. Several European Universities presented their research in operating, controlling and protecting distribution grids. The highlight was the presentation of the Best Young Academic Paper Award Winner of Session 3 (Sebastian Palm) about island detection.

POSTER TOURS

In eight different, very well organized and attended interactive Poster Tours (three Operation-Tours, three-Control-Tours, two Protection-Tours) mainly guided by members of the Session Advisory Group (SAG) most authors took the opportunity to present their Poster in detail. After the Poster-Tours a lot of intensive and long lasting discussions occurred along the Poster lane.

CONCLUSIONS

Highlights of Session 3 at Cired 2019 were especially the upcoming hot topics in the field of Ancillary Services from distribution level, Islanding Operation as well as LV- and MV-automation and specially the discussion about the lack of knowledge. Beside this a plenty of small or large improvements and new promising ideas in the field of Operation, Control and Protection have been presented.