

EXECUTIVE SUMMARY

Session 3: Operation, Control and Protection

SUMMARY

For CIRED 2017 about 350 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 the high number of abstracts, Chairman and Rapporteurs of Session 3 had to be – once again – quite strict 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 175 abstracts – about half of the proposals – were accepted by National Committees and the Technical Committee (TC). Finally 156 full papers have been accepted for Session 3. Most authors gave a poster presentation, 23 of them did additionally present their paper in the Main Session and seven papers were allocated to the Research and Innovation Forums (RIF).



Session 3 Team:
Ignaz Hübl, Markus Zdrallek Carsten Böse
See you all in Madrid 2019!

MAIN SESSION 3: Block 1

Operation

This block covered all the classic operation topics like Condition Assessment, Maintenance optimisation, Crisis- and Workforce Management. A new and upcoming topic is providing Ancillary System Service on Distribution Level. Due the massive increase of decentralized renewal generation in Medium Voltage(MV)- and Low Voltage(LV)-grids these voltage levels are becoming more and more important to contribute to System Services, too. This sooner or later calls for a new enhanced role of the Distribution System Operators (DSO).

MAIN SESSION 3 - BLOCK 2

Control

The majority of papers in the Control block covered MV- or even LV-automation systems. This trend of automation systems moving towards voltage levels where they have never been used before has been constantly rising during the last Cired-Conferences since observability and even automatic control of these voltage levels is becoming more and more important. While during the last two conferences mainly pilot projects have been presented, there are now first DSOs are beginning to turn such systems into standard applications. Beside this several improvements in the fields of SCADA- and Distribution Management Systems, Communication and IEC 61850 were presented. Especially Islanding is becoming a more and more hot topic, where the focus of the contributions moved from detection of islands to islanding operation in case of major blackouts.

MAIN SESSION 3- BLOCK 3

Protection

Protection is getting more and more important as changes in functions have to be discussed to face the challenges from decentralized distribution systems. This block does not only cover the protection functions and concepts itself but also questions of locating faults and how to detect earth faults. Since several CIRED conferences new intelligent electronic devices (IED) have been presented in papers, posters and oral presentations but with better communication technologies and cheaper devices the number of field test is still increasing. One major aspect in this year's CIRED was the protection of grids with high degree of renewable / distributed generation. ROCOF (Rate of Change of frequency) was the most discussed algorithms and has also been highlighted by a separate Round Table.

ROUND TABLE 10**Resilience of distribution grids**

This Round Table was chaired and organized by Maria Luisa Pestana, chairwoman of the Cired Working Group (WG) "Resilience of Distribution Grids". Several members of the WG presented their point of view on Organizational Resilience, which implies not only the ability of the system (physical and technological infrastructure) to withstand and recover from critical events, but also how the company as a whole – including its human resources – contributes to ensure the organization's success.

The intensive discussions after the presentations among DSOs clearly indicated how wide spread and important this topic is. Especially those DSOs facing big crisis or blackouts in the past years are very much aware. The Final Report of the Cired WG is expected in summer next year.

ROUND TABLE 12**Control and automation systems for electrical distribution systems**

This Round Table was chaired and organized by Carsten Böse, Rapporteur of TC Session 3. Three presenters have been invited to give an overview about actual projects on network automation in LV and MV networks. With decreasing cost for components, increasing functionality of automation functions and the development of technologies like cloud computing and the use of mobile device the way of operation networks is rapidly changing. Also the requirements for control and automation systems at TSO/DSO interface are presently discussed and content of a CIRED/CIGRE Joint Working Group (JWG C6.25/B5). The report of this JWG will be published soon.

ROUND TABLE 14**ROCOF – functional requirements for frequency protection**

This Round Table has been organized by Richard Marenbach, General Manager of OMICRON in Erlangen, Germany and Ignaz Hübl, Rapporteur of Session 3 and it was chaired by Richard Marenbach. Rate of change of frequency (ROCOF) is a highly discussed topic in several areas of protection. On the one hand this protective function is very important for detecting unwanted islanding in a distribution grid, on the other hand this function is used to protect the system against loss of stability. The round table addressed common hurdles for proper measurement of frequency and their approaches to solve these issues.

RESEARCH & INNOVATION FORUM SESSION 3***Operation, control and protection***

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 power systems. The strong focus of nearly each paper was on integration of renewable, converter-based generation units and storage into the grids.

POSTER TOURS

In eight different, very well organized and attended Interactive Poster Tours mainly guided by members of the Session Advisory Group (SAG) most authors took the chance 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 2017 were especially the upcoming hot topics in the field of Ancillary Services from distribution level, Islanding Operation as well as LV- and MV-automation. Beside this a plenty of small or large improvements and new promising ideas in the field of Operation, Control and Protection have been presented.

But the funniest highlight of course was beautiful Natalie and Zuzi from the Organising Team walking through the Lomond Auditorium during Block 2 of the Main Session 3 when Chairman and Rapporteur watched 350 men heads turning around forgetting to follow even the most impressive technical presentations on the floor... ☺.