



# EXECUTIVE SUMMARY

## Session 3 – OPERATION

### SUMMARY

Session 3 covers all topics related to the operation of electrical distribution networks. In 2025, this session started with the Round Tables and RIF. The next day, the four blocks of the main session followed. The final event was the poster session with around 100 posters. The participation and interest in the topics was very high.

### MAIN SESSION 1 - BLOCK 1/2

#### Condition Monitoring and Maintenance Strategy

Main session 3 started with condition monitoring and maintenance strategy topics as the thermal modelling and degradation analysis of LV cables from UK, AI based vegetation management in Portugal and a condition-based maintenance of air insulated HV circuit breakers from Germany. Strategies for generation, storage and flexible loads were covered by two presentations about field demonstrations for validation of simulations for curtailment based on state estimation in Germany and a case study on Island Sao Miguel (Portugal) focusing on demand side management at EV charging. The challenges and an IT/OT architecture for managing LV Grid were presented by another German contribution. A systematic analysis of options to mitigate overvoltage in LV Grids and their application was reported from Belgium.

### MAIN SESSION 3 - BLOCK 2/3

#### Operation Center

Related to the tasks in the operation center there were three presentations from Netherlands and Norway regarding thermal rating and one related to the reliability of an urban HV grid in Switzerland on optimizing congestion management. A systematic long-term visualization of reactive and active loading to support the planning of operation was presented from an Austrian DSO. A contribution from France introduced a test of customers requested to mitigate their load to prevent system from Blackout resulting in reduction of 3GW/10 Mio households. A presenter from UK reported a solution to continue operation in case of loss of communication with data from machine learning. DSO and SCADA developers from Germany reported about successful preventive automated LV network control and management in a field trial. Customers' requests in case of loss of supply are running many times into wasted interventions as customers' installations fail. A presented AI solution analyzing customers' requests saves 3,7 Mio EUR per year all over France.

### MAIN SESSION 3 - BLOCK 4

#### New use cases and applications

New use cases and applications in the field of operation were reported from Croatia where the assessment of constrained areas and available hosting capacity is performed based on measurement data. A system performing state estimation from real time smart meter data and voltage control by transmitting setpoints via smart meter communication tested in the field was presented by French Authors who addressed the risk of temporarily loss of communication. Also, from France the test of an AI based Home Energy management System was reported, demonstrating less uncertainty compared to rule-based ones. The first LVDC network operated by a public DSO to be used as a living lab was reported from Belgium. An Austrian contribution presented a new application to improve the interoperability unified vocabulary for energy management systems applied at energy communities, including a pilot test. The session closed with a report on applying PMU devices in LV Grid for observing, monitoring, dispatch and control of the network.

### ROUND TABLE 2

#### Modelling customers profile and response to optimize network operation

RT2 addressed the need for models of new customers' behavior such as PV, EV, and storage for a good operation of the distribution network. Several topics were debated: granularity of models depending on their



application (short or long term forecasting for example), dynamic tariffs, how to ensure good data and models coordination between DSOs and TSOs, especially when TSOs need flexibility from assets connected to the DSOs' perimeter.

## ROUND TABLE 5

### Management of Distribution System Operation during Crisis

RT 5 focused the management of distribution system operation during crisis. The RT was moderated by the Session Advisory Group member Marina Cavlovic. Four panelists from UK and Germany discussed needs and opportunities of distribution system operators during crisis situations. The large outage in Spain and Portugal was still in mind and the panelist showed which kind of actions are needed to withstand crisis. After 1.5 hours there were still so many topics which have to be discussed, but the awareness of preparing measures before crisis situations occur is getting more important.

## ROUND TABLE 6

### Thermal Rating in Distribution Systems

The topic was of interest for about 170 participants. The five panelists from research and industry provided a wide range of knowledge regarding thermal behavior and degradation for several components. The questions from perspective of DSO "how to start applying of thermal rating?" and requirements for monitoring, simulations etc. were intensively discussed. There are still many questions remaining but there is a high potential to apply thermal rating without reducing the levels of safety and secure supply.

## RESEARCH & INNOVATION FORUM

The RIF session focus on universal research in the field of network operation. 9 papers had been presented by young researchers starting with forecasting and ending with sensors placement and state estimation. The RIF has once again addressed the topics that are becoming increasingly important for the future of the operation of the distribution networks. As part of the RIF, this year's BYAA winner, Fernando Lanás, also presented his contribution to forecast methods.

## POSTER TOURS

About 100 posters had been presented during the 6 poster tours on Thursday morning and early afternoon.

## CONCLUSIONS

The theme 3 presentations confirmed a clear trend towards an increasing amount of real-world implementation of new solutions, including the presentation and exchange of gained experiences as well as lessons learned.