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**Taking probabilistic reliability management from theory to practice: challenges,
lessons learnt and next steps**

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While in theory the potential benefits of migrating towards a probabilistic approach to reliability management are well understood achieving such transition is not straightforward in practice. To be able to realize such theoretical benefits, several challenges still need to be resolved. This discussion will summarize the lessons learnt throughout the GARPUR project (<https://www.sintef.no/projectweb/garpur>) wherein 7 European *Transmission System Operators*, 12 *Research Institutes* along with an *Innovation Management Expert* focused on the question of putting a probabilistic *Reliability Management Approach and Criterion* (RMAC) in the place of the deterministic N-1 approach.

The first part of the discussion will set the scene by introducing the main features of the probabilistic RMAC developed in the GARPUR project. Its functionalities for *reliability assessment* and *reliability control* as well as the potential to consistently apply such approach in all timescales & activities (i.e., from long-term system development, through mid-term asset management to short-term operational planning and operation) will be presented at the high level. Finally, the key upgrades with respect to the deterministic N-1 approach will be underlined.

The second part of the discussion will focus on reliability assessment, drawing upon the practical experience obtained from Landsnet while pilot-testing the GARPUR RMAC on the Icelandic system. The GARPUR pilot test at Landsnet provided experience into how probabilistic tools can be implemented in operation. Of particular interest are the main challenges encountered during development, and the potential improvements of the final tool. These challenges relate to the formulation of the problem, developing scalable algorithms, ensuring results are transparent and understandable, and presenting the results in a useful format for operational staff. Improvements relate to the computational efficiency of the method and making such tools more useful within the day-to-day decision making of operational staff.

The third part of the discussion will present the experience of using the GARPUR RMAC for short-term reliability control, based on developing the GARPUR *Quantification Platform* (GQP) and pilot-testing its use on a representative part of the French HV grid. During the pilot test a number of computational challenges were observed. The biggest challenges stem from obtaining a scalable formulation and simplifications

made to achieve a computationally efficient implementation. This part of the presentation will detail the challenges observed and give recommendations for efficient and more accurate implementations to incorporate probabilistic reliability management in planning and operation.

Please send the Abstract to dsobajic@gridengineering.com by April 12