

## Operation of interconnected systems under emergency conditions – Experiences made in Inter TSO training sessions

Udo Spanel  
DUtrain GmbH, Germany

### Abstract

The transmission system operators (TSO) of the continental European interconnected power system (ENTSO-E RGCE – the former UCTE system) have to comply with the rules of interconnected operation written in the so called ENTSO-E RGCE operation handbook [1]. The operation handbook is chaptered into different policies. Of most relevance for the control room activities are the policies about ‘Load frequency control and performance’ (Policy 1), ‘Operational security’ (Policy 3), ‘Emergency Operation’ (Policy 5) and ‘Operational training’ (Policy 8). In policy 8 it is recommended to have common training sessions on an operator training simulator.

DUtrain is an independent training centre for power system operation and control. The company maintains its own operator training simulator. The activities in common training sessions for TSOs – called Inter-TSO training has started in 2007.

The existing simulator has to be upgraded to new challenges forced by this training. This covers technical issues as the data model, the specific functionalities like N-1 calculation and multiple AGC as well as handling the multiple control rooms in parallel. At the same time the handling of the overall power system including generation and load dispatch from the trainers’ perspective during the training session and during the training scenario preparation has to be enabled.

Further, the organization of such kind of training is a challenging task. Starting with commonly agreed dates for the training, the organization task comprises some logistic efforts, the definition of the scenarios to be handled in the training, the evaluation of each particular training session. A yearly final evaluation closes the feedback loop.

The performance of a training session itself requires new abilities of all participants. According to the Operational handbook English is used as the common language which is a non-native language in continental Europe. Specific operational solutions of individual TSOs have to be respected. This covers the technical infrastructure of the power system under regard but also the legal and commercial environment.

The presentation will give an overview about the experiences made. It covers the technical issues of the operator training simulator used, the organization and the performance of Inter-TSO training sessions. The scenarios used are briefly outlined. Further it is mentioned how the results from this Inter-TSO training are used.

[1] Operation Handbook of ENTSO-E Regional Group Continental Europe  
<https://www.entsoe.eu>