

## Multiple Discussion Topics:

### Dispatcher Training, Dynamic DTS and Voltage Recovery

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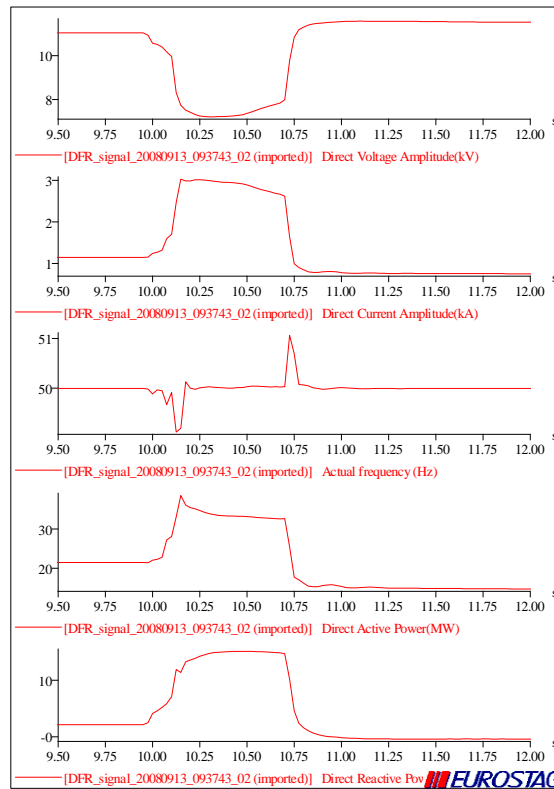
#### Abstract

##### **ADVANCED TRAINING FOR DISPATCHERS ON EMERGENCY PROCEDURES**

FAST the advanced dispatcher training simulator developed by Tractebel Engineering can reproduce in details the dynamical behaviour of the ETN. It uses an extended electromechanical model that is able to reproduce using a single database not only long term and quasi steady state phenomena but also the fast phenomena, electromechanical swings, loss of synchronism and detailed protective devices. The use of such advanced model adds another dimension in the training of the dispatchers that are able to analyze the impact of their actions not only on the observables that are represented in the classical Man Machine Interface (MMI) but also on the electromechanical and control variables (e.g. machine speeds, prime mover or exciter variables...). In the frame of the collaboration between ELIA and Tractebel Engineering a new scenario has been jointly developed to inform the dispatchers about the emergency procedures defined in ENTSOE policy 5 (ENTSO-E, P5 - Policy 5 - Emergency Procedures v1.0/03.05.06, 2006) that have to be used in case of strong disturbances and severe frequency deviations in the interconnected ETN. The scenario and the general structure of the simulator will be briefly presented.

##### **IMPACT OF THE SELF-DISCONNECTION ON THE VOLTAGE RECOVERY IN CASE OF LARGE PRESENCE OF ROTATING LOADS**

A significant part of the load supplied by the distribution systems in some countries during hot summer period has an air conditioning (AC) nature. The driven rotating load is supplied directly or through inverter interface by motors. The under-voltage and over-current relays must be adequately taken into account to predict the plausible behaviour of the system following large disturbances and the possible consequences (Figure 1). The load intermittent behaviour should be also modelled also in the control centres by the tools assessing the security of the system. A possible modelling approach for the load will be presented and discussed.



**Figure 1 : Recording of a load rejection as consequence of a fault on the system.**

## **FULL DYNAMIC DTS FOR LARGE SCALE SYSTEMS**

In the frame of PEGASE FP7 R&D project, a large scale real time DTS is being developed. It will be able to calculate in real time the behaviour of the European power system from an electromechanical model of the PAN-EUROPEAN ETN including more than 120.000 variables and detailed topologies for more than 12.000 substations. The discussion will introduce the aim of the project, the status of the development, the expected results and challenges and the interests for a European dynamical training simulator for operators.