



Safe and Smart Grids: The Grid Training Centre in Cottbus, Germany

Hans-Jörg Dorny
50HERTZ TRANSMISSION GMBH
RGI-Workshop in Montreux, January 2011

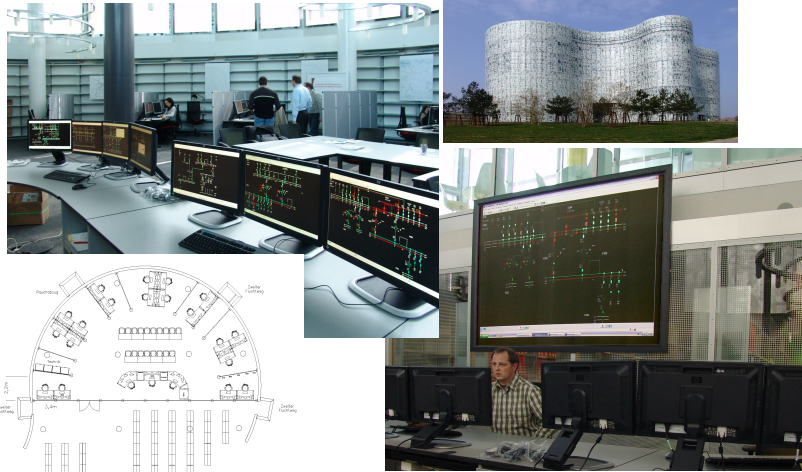


Table of contents

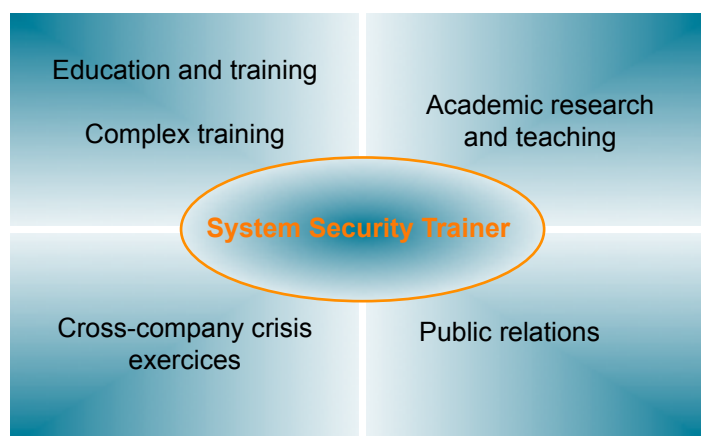
1. The Grid Training Centre in Cottbus
 2. Motivation for building up the Grid Centre: Challenges of the future
 3. Realisation: Technical details
 4. Simulation of critical grid situations
 5. Perspectives for the future: Simulating Smart Grid structures
-



Grid Training Center in cooperation with the Brandenburg University of Technology



Project scope





Education and Training / Complex training

- **Individual or group training of several TSOs and grid connection customers,** such as system-critical situations training in order to avoid partial or total grid collapse:
 - Grid elements malfunction
 - Grid elements overload
 - High renewables supply under different load conditions
 - Malfunction at the customer or production unit level
- **Grid restoration training**



Until grid extension more training for all actors is an urgent necessity

TSO – DSO

The cooperation set out in the agreements takes place on request and as appropriate; the first DSOs have already provided their data to the System Security trainer

TSO – TSO

International TSO-TSO Training according to the recommendations of ERGEG after the serious system failure on 11/04/2006 and to the instructions of the European network ENTSO-E

System responsibility in accordance with the German Energy Industry Act (EnWG)

According to the model contract of the BDEW (Federal Association of the Energy and Water Industries), the tense grid situation was unparalleledly discussed with all actors during the annual security conference; behaviors were decided, agreed in contracts and put into practice.



Energy Regulators/ Crisis Teams

Option: education, training and common exercises by and with the Energy regulation authorities and civil protection services of the Länder (German federal states).

The System Security Trainer at the BTU Cottbus is operational today, and provides for a training under real conditions.

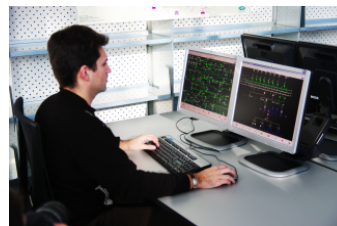


Motivation

1. Ensuring our collaborators' highest level of know-how
2. Meeting the ENTSO-E regulations (i.e. Inter-TSO Training)
3. Meet new and growing challenges (i.e. Integration of renewables into the electrical system; EU Internal Market; Smart Grid Technologies)

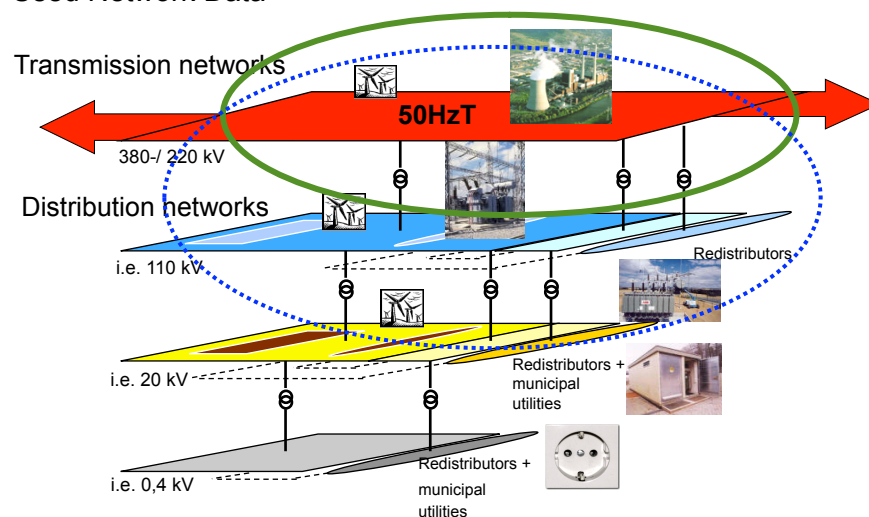
Gradients in the Grid of 50Hertz

• In 2005	
• within 15 min:	+/- 300 MW
• within 60 min:	+/- 1.000 MW
• within 24 h:	+/- 5.000 MW
• In 2009	
• within 15 min:	+/- 1.000 MW
• within 60 min:	+/- 3.000 MW
• within 24 h:	+/- 7.000 MW



Realisation

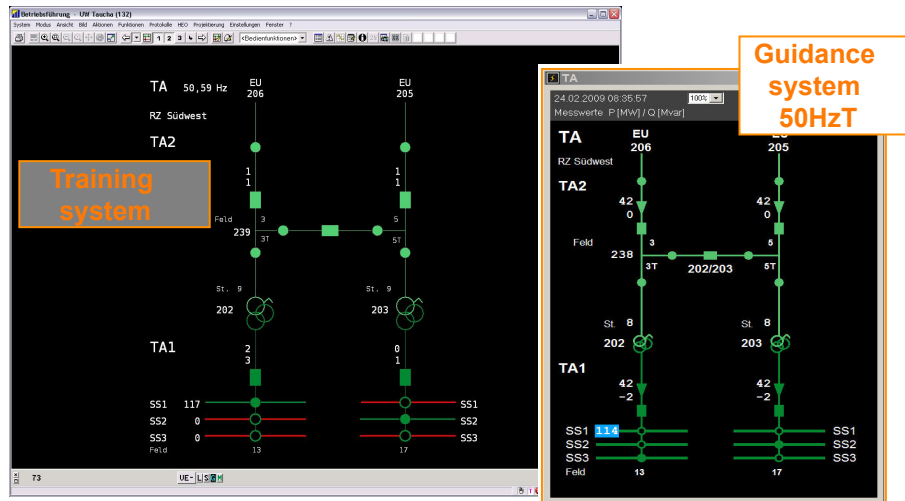
Used Network Data



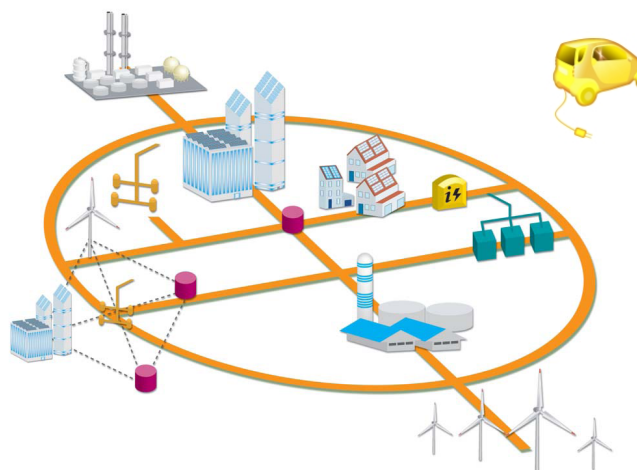


Realisation

Visualisation – User related interface



Perspectives for the future: Simulating Smart Grid structures





Many thanks for your attention
