Study context: Wind energy promotion (Kyoto agreements + liberalization of the electrical market) => Impact on transmission system safe operation.

Objective of the work: Safe management process of modern bulk power systems with an increased wind penetration => Modification of the simulation tool Scanner© (property of Tractebel Engineering) in order to integrate wind generation => *Wind stochastical modeling and realistic implementation!*

Question addressed in this paper: How to quantify an eventual reduction of real transmitted wind power (RWP) due to high powered (non modulable) classical (nuclear, thermal, cogeneration,...) units operating constraints?

Simulation scheme: Real Belgian transmission system

Simulation results at HLII level (integration of transmission constraints)

Simulation results at HLI level (infinite node hypothesis)

Risk of congestions between Rodenhuize and Heimolen: International power flows + offshore wind power

Impact of operational constraints => reduction of transmitted wind energy with the addition of 1.2 GW dispersed generation at the distribution level

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