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Initial Dynamic Model

NEPLAN 360

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Initial Dynamic Model – Test case

1. General

The document reports statistics and test case results of ENTSO-E Initial Dynamic Model implemented in web-based NEPLAN 360 power systems analysis tool.

The Initial Dynamic Model is a reference model for the Continental Europe (CE) power system, suitable for studies and dynamic evaluations. The model was prepared by ENTSO-E System Protection and Dynamics (SPD) experts based on physical considerations and expert knowledge for the European power system dynamic behaviour [1]. A general overview of the Initial Dynamic Model elements is given in Table 1.

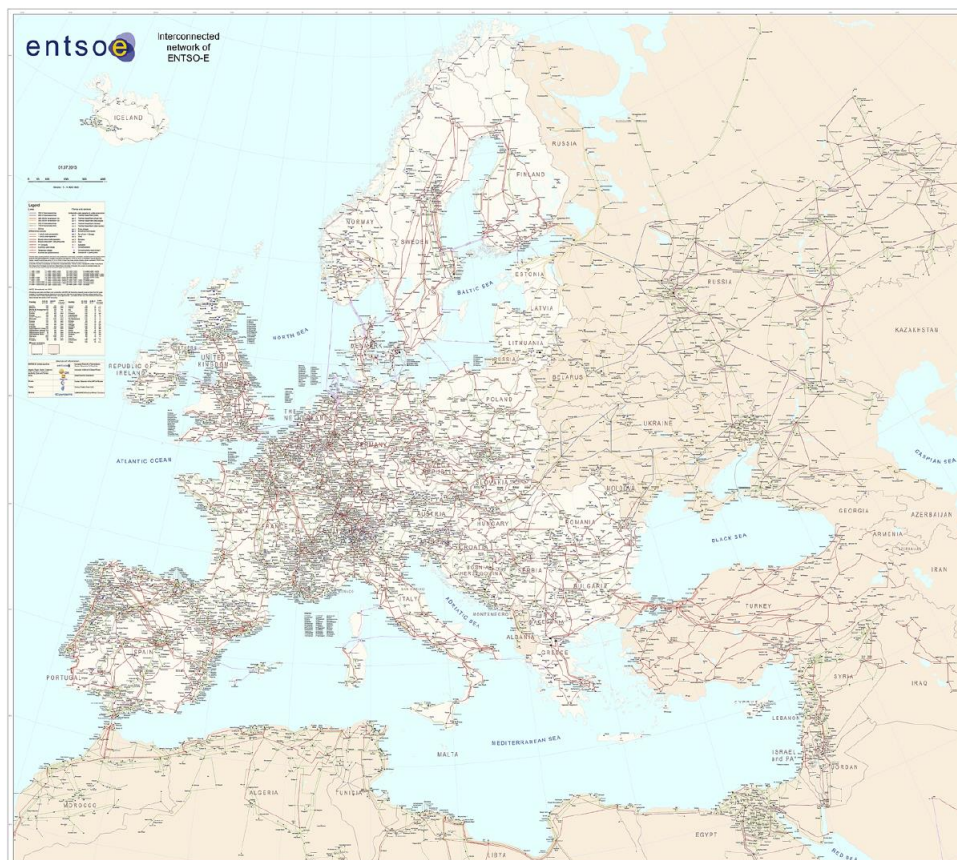


Figure 1 – Interconnected network of ENTSO-E [2]

Type	Number of elements
Busbars	21 506
Synchronous Machines	1 146
Exciters	1 013
Turbines	996
PSSs	996
Lines	18 456
Loads	11 328
2W Transformers	7 879
3W Transformers	1 153
Shunts	760
Equivalent SeriesLF	28

Table 1 – Initial Dynamic Model statistics

2. Simulation results

The Initial Dynamic Model is simulated in NEPLAN 360 by means of Dynamic Analysis module. The simulated disturbance is a generation loss of $P \approx 1\text{GW}$ in Western Europe. The dynamic analysis performs a 50 seconds simulation approximately in 30 seconds. The results are shown in Figure 2 and report the frequency response of three generation units from different European areas.

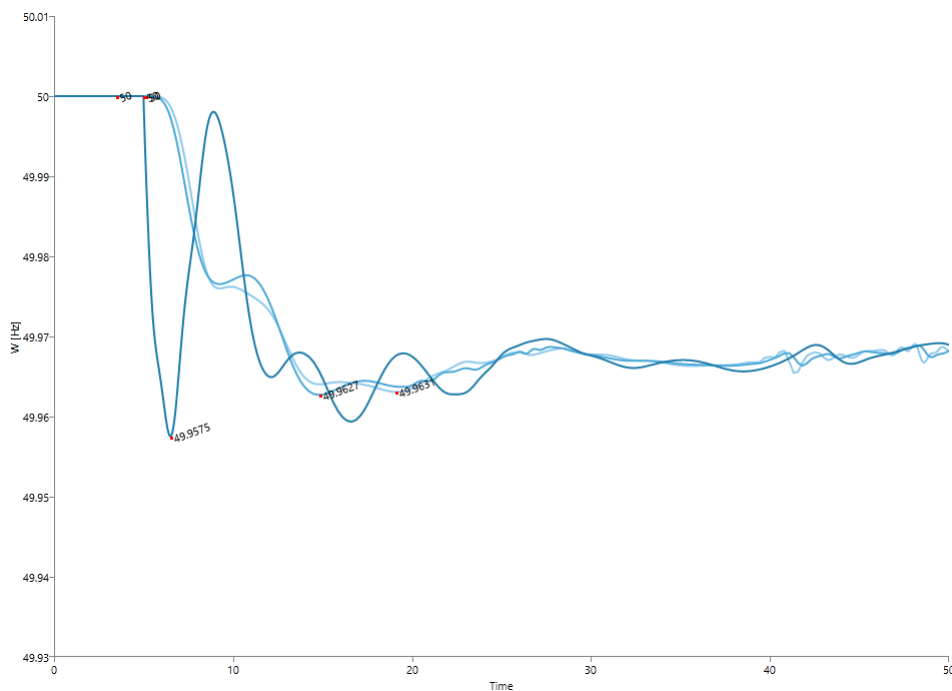


Figure 2 – Frequency response for 1GW generation loss

REFERENCES

[1] ENTSO-E WG SPD, "Instruction manual - Dynamic Study Model: Range of Applications and Modelling Basis, V6.1 / 09.01.2015" <https://www.entsoe.eu/publications/system-operations-reports/continental-europe/Initial-Dynamic-Model/Pages/default.aspx>

[2] A. Semerow, S. Höhn, M. Luther, Walter Sattinger, H. Abildgaard, A. Diaz Garcia, G. Giannuzzi "Dynamic Study Model for the Interconnected Power System of Continental Europe in Different Simulation Tools", PowerTech 2015, Eindhoven