ENTSOE Basic Tests by NEPLAN

The simulations indicated on Control Test Report (November 2013) of ENTSOE are implemented by using NEPLAN Power System Analysis tool. The projects configuration and the results are shown below.

1. **BASIC Test Grid configuration and its Load flow calculation**

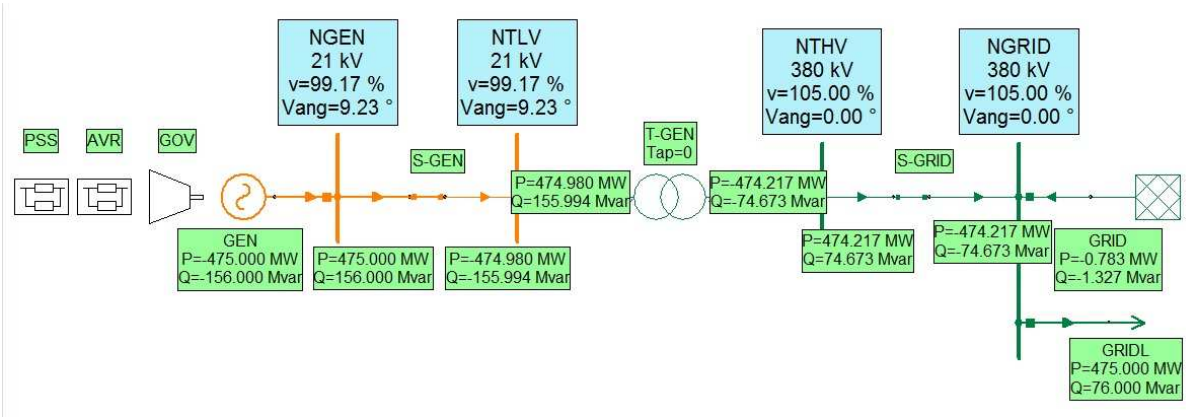

Fig.1: Results of the basic load flow

The results of LF are correct by considering the configuration and the parameter values on ENTSOE report, page 10.

2. **CASE 1 Dynamic analysis**

The following configuration carries out from page 11 of ENTSOE report for the CASE 1

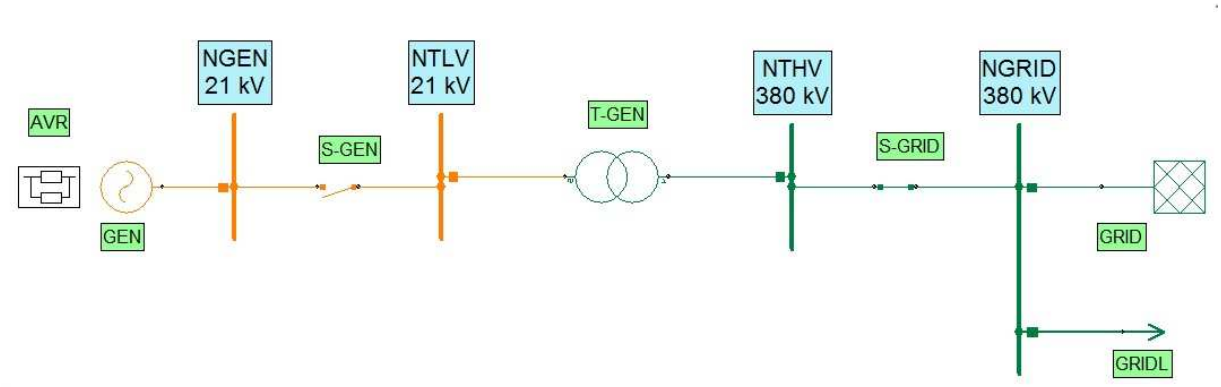

Fig.2: Configuration Case 1

By comparing the below results with the results on page 14 of ENTSOE report, the same behaviour is shown.

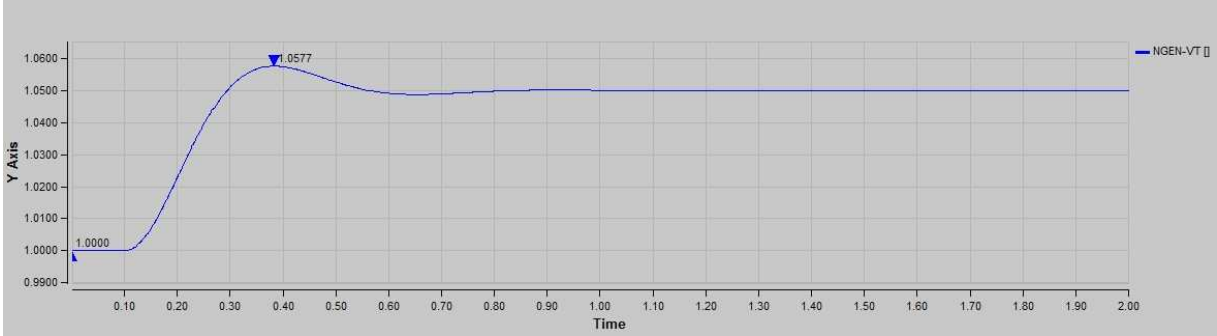

Fig.3: Response of terminal voltage of machine in case 1

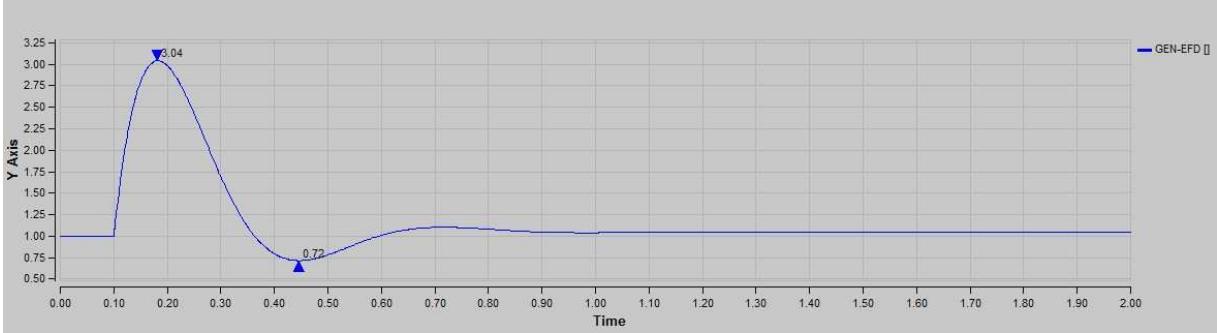

Fig.4: Response of excitation voltage of machine in case 1

3. CASE 2 Dynamic analysis

The following configuration carries out from page 11 of ENTSOE report for the CASE 2

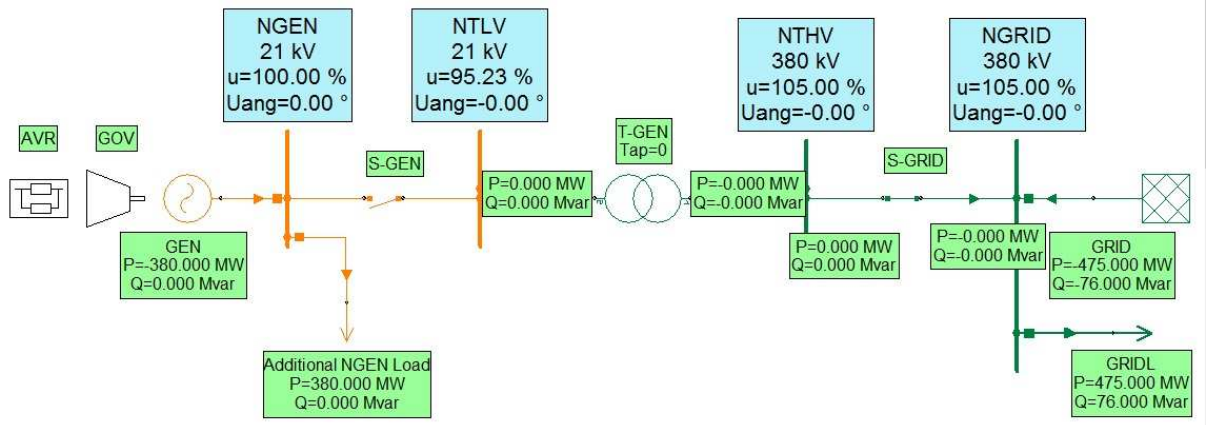

Fig.5: Configuration Case 2

By comparing the below results with the results on page 15 and page 16 of ENTSOE report, the same behaviour is shown.

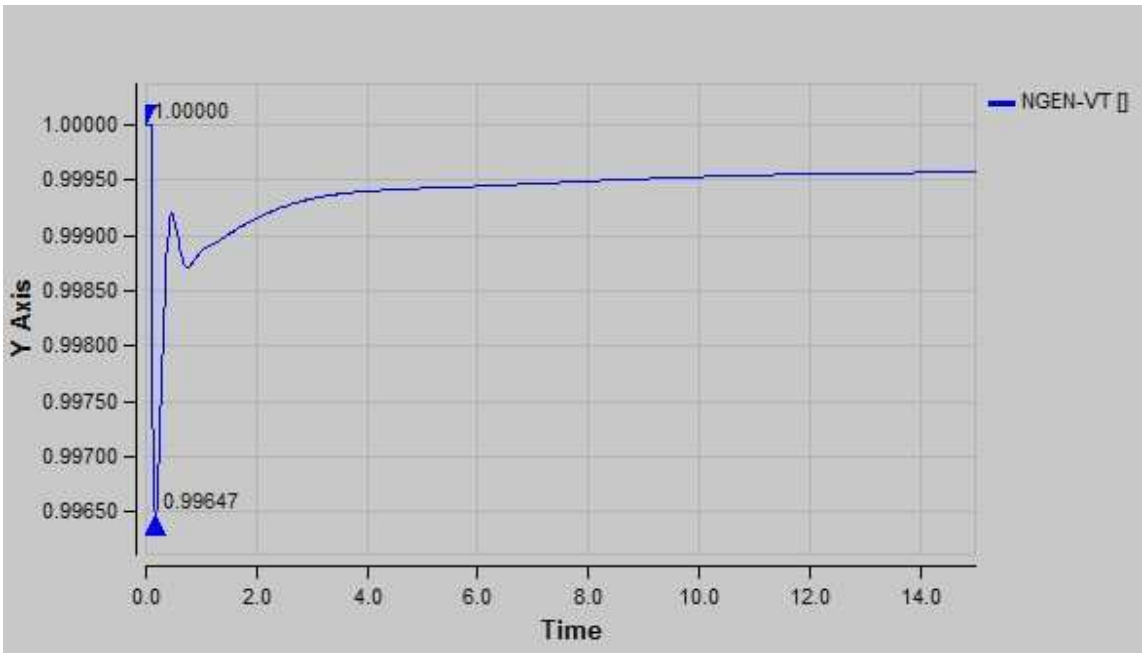

Fig.6: Response of terminal voltage of machine in case 2

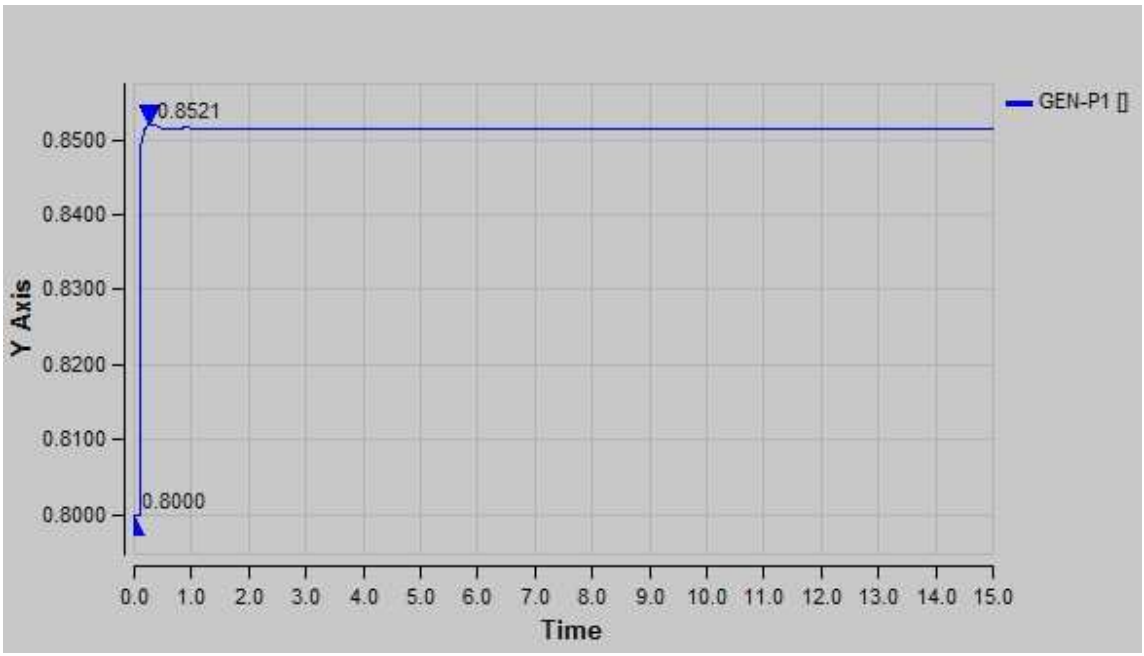

Fig.7: Response of active power of machine in case 2

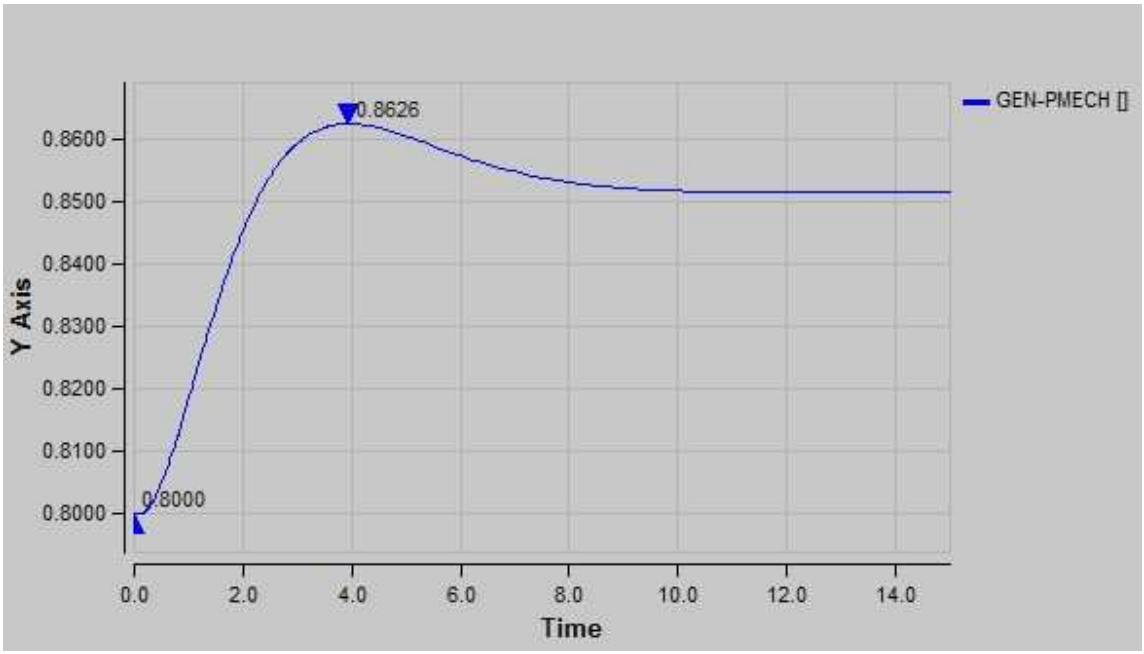

Fig.8: Response of mechanical power of machine in case 2

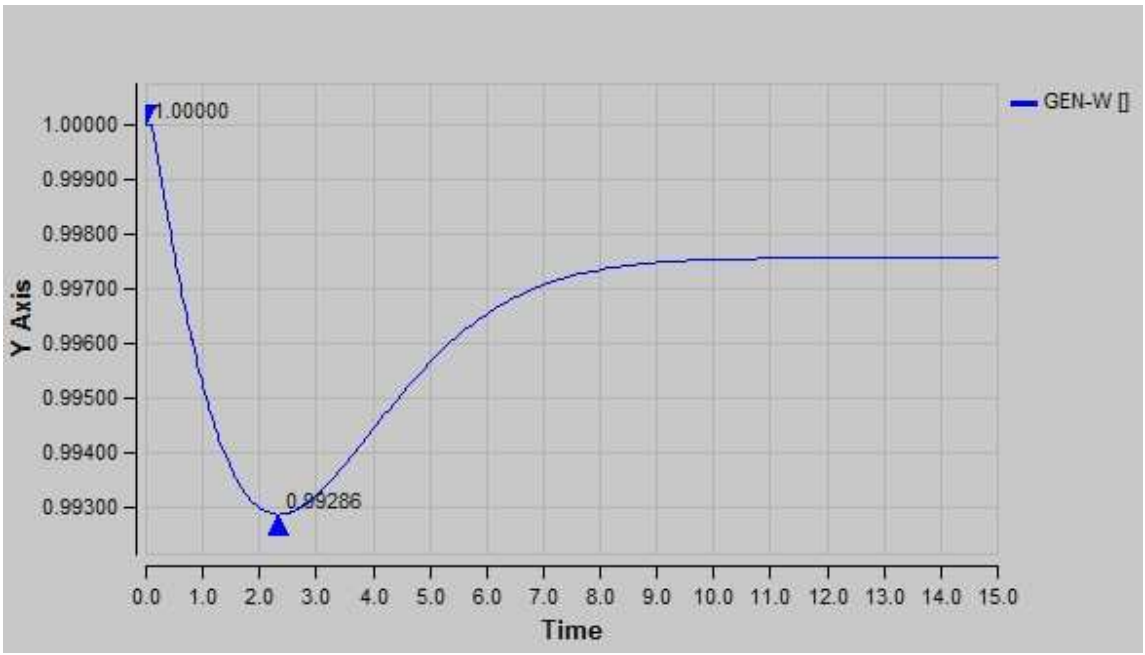

Fig.9: Response of machine speed in case 2

4. CASE 3 Dynamic analysis

The following configuration carries out from page 12 of ENTSOE report for the CASE 3

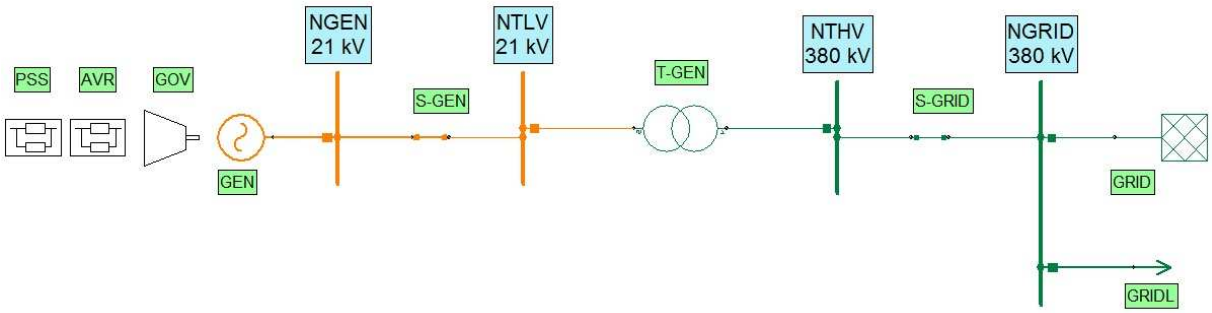

Fig.10: Configuration Case 3

By comparing the below results with the results on page 17, 18 and page 19 of ENTSOE report, the same behaviour is shown.

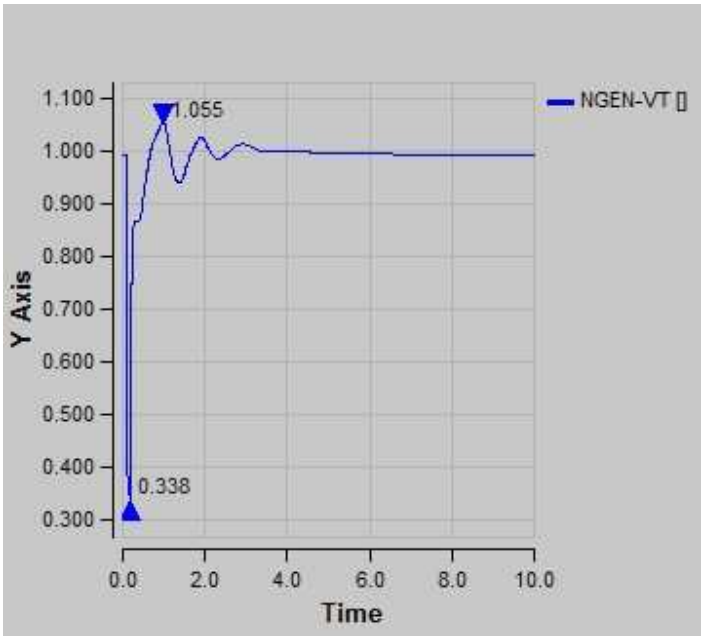

Fig.11: Response of terminal voltage of machine in case 3

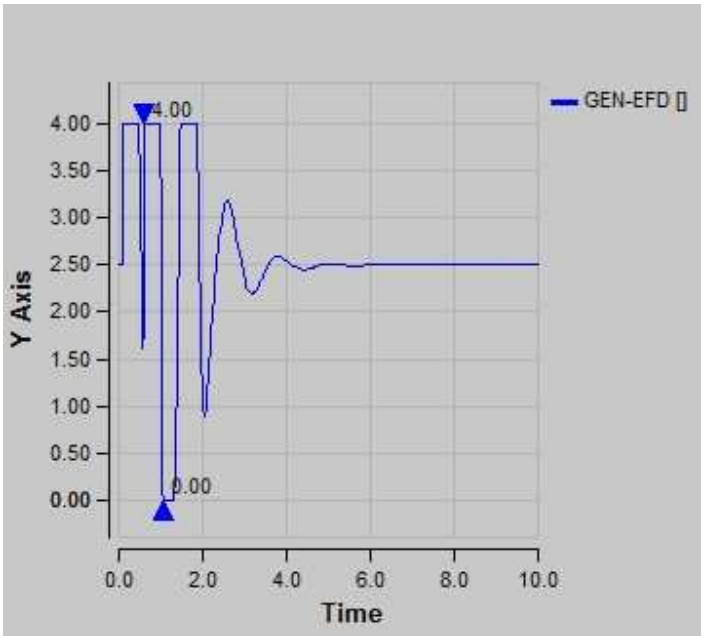

Fig.12: Response of excitation voltage of machine in case 3

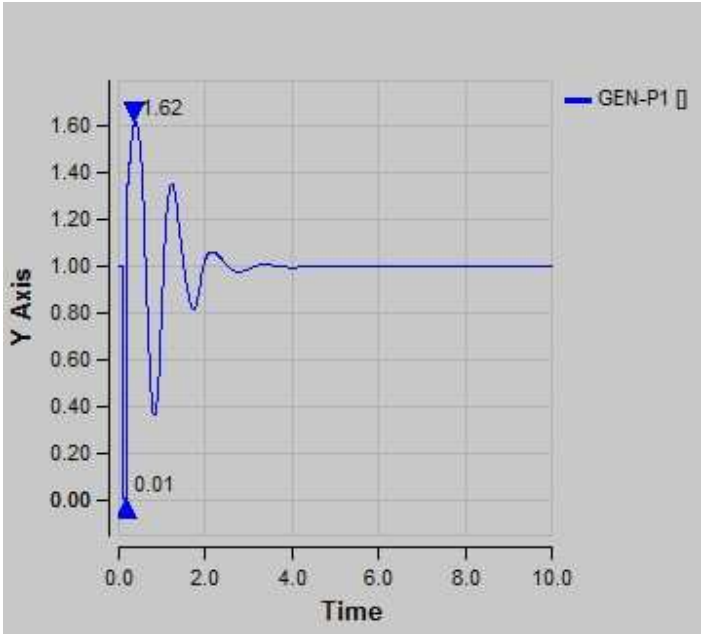

Fig.13: Response of active power of machine in case 3

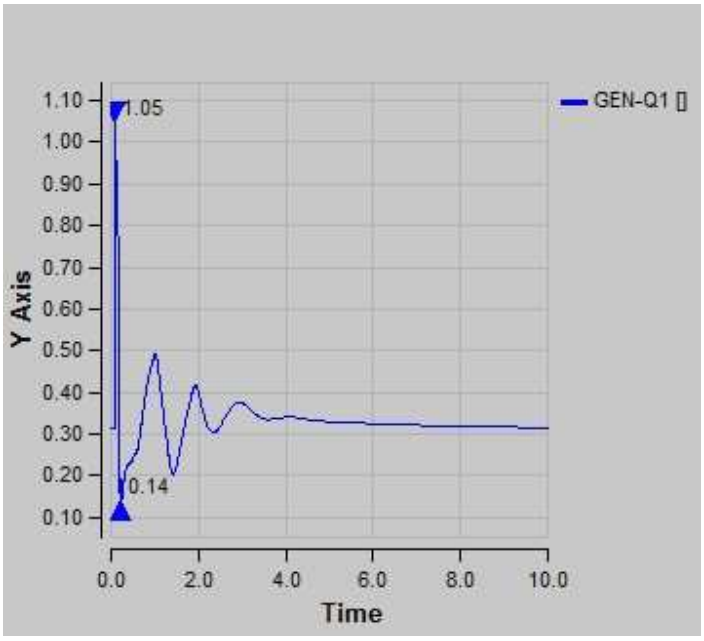

Fig.14: Response of reactive power of machine in case 3

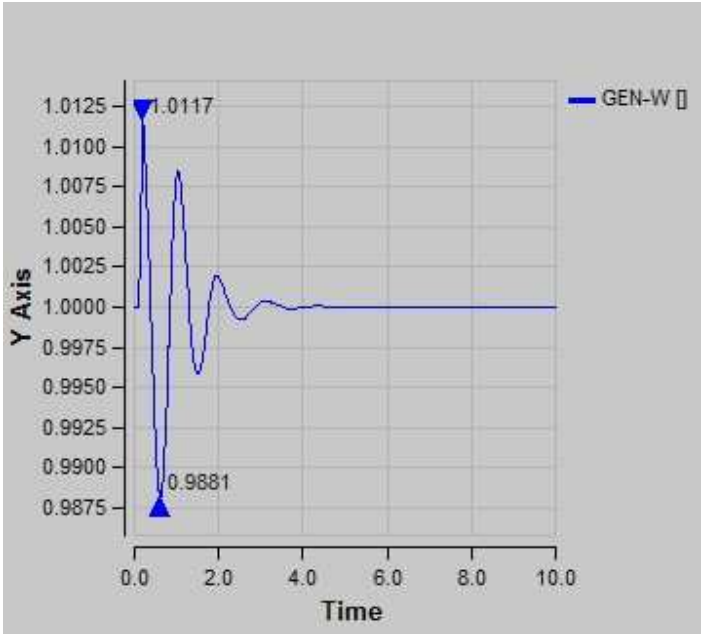

Fig.15: Response of machine speed in case 3

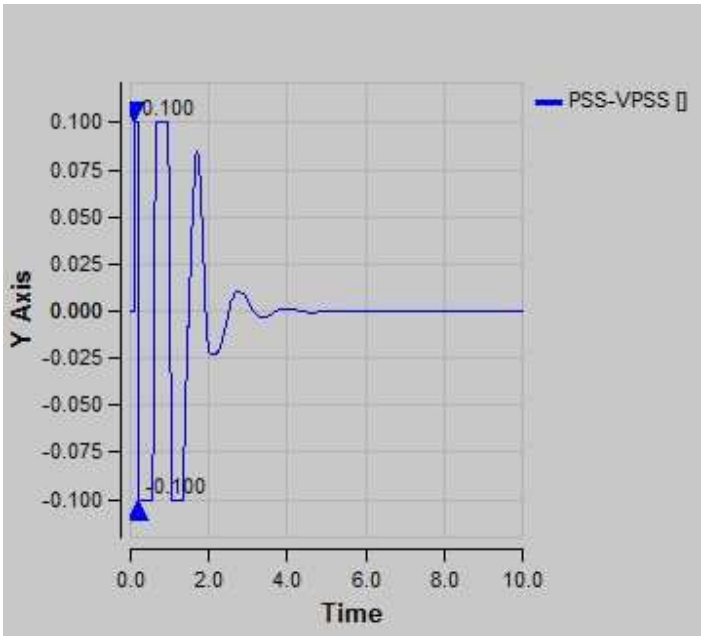

Fig.16: Response of PSS output signal in case 3

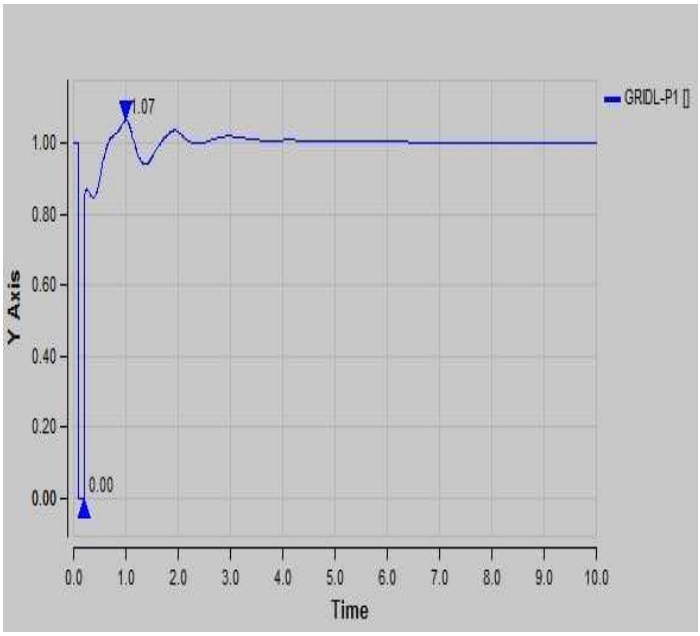

Fig.17: Response of Load Active Power in case 3

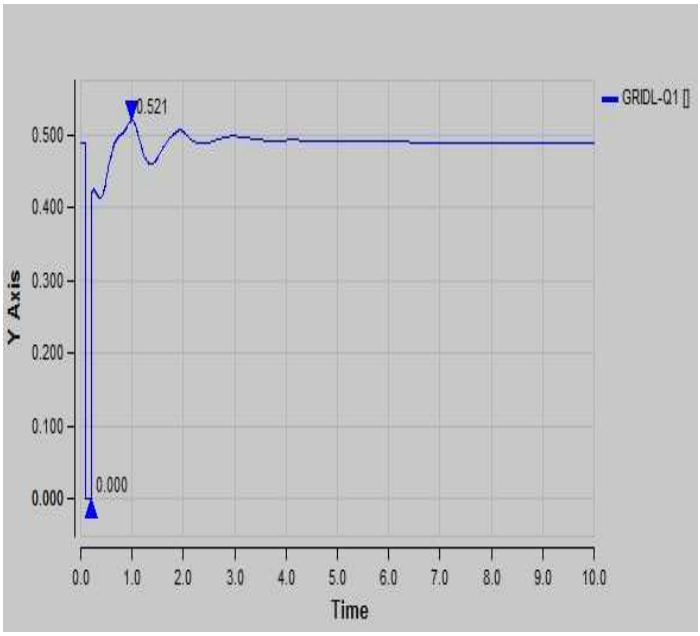

Fig.17: Response of Load Reactive Power in case 3

CONCLUSION

The results show a good accordance between NEPLAN and the others simulation tools with some small deviations due to different model implementations. Most of the identified deviations are neglect able for the purpose of dynamic modelling of the Continental European synchronous power system and the objective of proper frequency response.