

AC Interference Study on DESFA Natural Gas Pipeline due to the Operation of a 20.8 MW Wind Park

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Abstract:

The paper will thoroughly describe the development of a boundary element model (see Fig 1) by using the HIFREQ module of CDEGS software to enable the AC Interference evaluation on 28.5km of DESFA natural gas pipeline routing near a 20.8MW Wind Park.

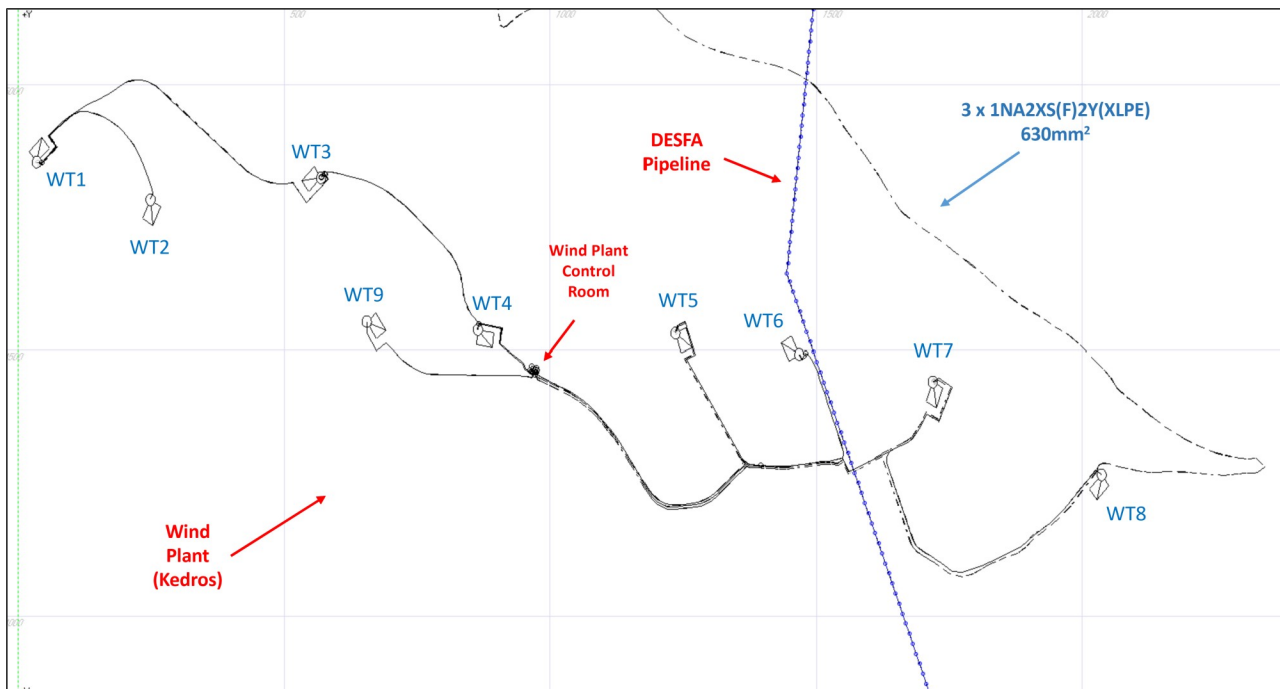


Fig. 1. Geometrically Accurate HIFREQ Template Model – Design Detail of Wind Turbines' Location

The simulation results (e.g. touch voltage, coating stress voltage, in line currents) will pertain to the following energisation conditions:

1. Steady-State Balanced Conditions at rated currents
2. Steady-State Unbalanced Conditions.
3. Single- Phase to Ground Fault Conditions
4. Symmetrical Three Phase Fault Conditions

The above described energisation conditions will be simulated in:

- a) Two-Layer Horizontal Soil Conditions (100 Ω m/ 1000 Ω m)

The paper will also include a description of the mitigation steps that are necessary to ensure that the AC interference on the DESFA pipeline remain within the limits dictated by EN 50443 “*Effects of electromagnetic interference on pipelines caused by high voltage a.c. electric traction systems and/or high voltage a.c. power supply systems*”.