HR3 meeting at ENS -11.02.2014 – on grid code compliance

Question	Response
Which grid code version will be applied for the HR3 project?	The tender material will refer to the Danish grid code TF 3.2.5:2010. An updated grid code will be released later this year. However, the operator is not obligated to implement the updated grid code, but has the choice between the updated and the existing from 2010.
Where is the POC, PCC and Voltage reference point?	The POC is at 33 kV on the horn of the low voltage side of the transformer on the platform The PCC is at the 220 kV bus bar at the land based substation The Voltage reference point is at the PCC
More information of the GIS system at the transformer platform was requested? Meeting on platform details?	When the final design specifications of the platform components are released relevant parts will be published. ENS will take action.
Requirements to the electrical simulation model?	As specified in TF 3.2.5:2010, Annex 2
Harmonics – how to calculate these?	ENDK provides impedance plot for the frequency range.
Short Circuit impedance – max, min, typical for the area?	The general short circuit specification given in TF 3.2.5 section 4 can be applied in general design considerations. When the detailed design phase is completed and the specific data for the infrastructure is available a specific impedance plot will be exchanged with the selected developer.
Time reference UTC / GPS?	Time reference options given in TF 3.2.5, section 5.1 shall be selected as the Universal Time, Coordinated (UTC).
Rated power – where to be measured?	The rated power shall be measured at the Wind Power Plant terminals – the POC.
Rapid voltage changes – during switching?	The specifications for Rapid Voltage Changes shall be understood as defined in IEC 61000-3-7, clause 3 and 10.
Available power calculation? Prediction of not delivered production? Compliance test – accuracy of estimated not provided power?	The algorithm, methodology and accuracy for estimation of available production shall be approved as a part of the grid connection compliance process and follow the specifications given in Energinet.dk market regulation E and related annexes. Compliance shall be verified as specified in TF 3.2.5. annex 5.
Protection settings	As per specifications in TF 3.2.5 section 6 and related annex.
Fault recorder?	Fault record systems shall be installed and configured as specified in TF 3.2.5 section 7.4
Vector jump relays – ROCOF?	ROCOF and Vector jump relays must not be installed as they could cause server control situations in case of failures.
High wind ride through requirements?	A high wind ride through functionality shall be provided. According to TF 3.2.5., section 5.7.3 a stepwise reduction in active power in case of high wind, the steps shall be less than 25% of the rated power. The typical time period shall be larger than 3-5 minutes. Typical wind speed range for down regulation is 6 m/s. Wind speed average period shall be 10 minutes.
Voltage levels – max. 36kV at POC?	According to the specifications given in TF 3.2.5 section 3 the maximum voltage variation for the normal operational range

	shall be +/-10%. The specific operational voltage and tolerance within the normal operational voltage range at the POC shall be negotiated between the parties after the detailed design is completed.
Reactive compensation at zero production	The Wind Power Plant shall be compensated in order to be neutral at the POC at zero production according to TF 3.2.5 section 5.9.4.
Loading of cable in case of failure + / - ??	The +/- specification for the max. loading of the transmission cable seems not to be relevant. Only the positive deviation is relevant.
Number of wind turbine in maintenance shall be provided?	Number of wind turbines in operation as well as number of wind turbines in maintenance shall be informed according to TF 3.2.5, Annex 4.