

STAKE HOLDER CONSULTATION PROCESS OFFSHORE GRID NL	
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Work stream	Technical
Topics:	T.15 Installation interface management
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QUALITY CONTROL		
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1. Moments of feedback

Feedback	Abbreviation
Expert meeting 27.11.2014	EM01
Expert meeting 29.01.2015	EM02
Expert meeting 18.03.2015	EM03
Expert meeting 15&16.04.2015	EM04
Expert meeting 12&13.05.2015	EM05
Consultation website March	WS01
Consultation website April	WS02
Consultation website May	WS03
Consultation website June	WS04
Consultation website November	WS09
Bi-lateral meetings	BL01

2. Feedback and action

Feedback	Feedback moment	Action
General: Please clarify which standard is used for harmonics.	WS09	Feedback was received after closing date of the topic. See "ONL TTB-3041 T15_Harmonic emission limits_PP_v2".
P3: Emission limits seem to be too conservative. please consider to measure harmonics on bus bar for the full wind farm.	WS09	Feedback was received after closing date of the topic. See "ONL TTB-3041 T15_Harmonic emission limits_PP_v2".
What is the procedure if we cannot comply to the standards?	WS09	Feedback was received after closing date of the topic. See "ONL

		TTB-3041 T15_Harmonic emission limits_PP_v2".
P4: "As part of this consultation the OWF shall specify the root loci for which compliance can be achieved without filters. " This statement is too general, as there might be more than one impedance characteristic, with which the specifications can be fulfilled.	WS09	Feedback was received after closing date of the topic. See "ONL TTB-3041 T15_Harmonic emission limits_PP_v2".
P4: " the amplitude of the harmonic current injected by the turbines at the connection point will be measured". This measurement is difficult to perform, being the harmonic currents very small in comparison to the class of the current transformers at HV and higher frequencies. It might be that wrong measurements lead to wrong conclusions.	WS09	Feedback was received after closing date of the topic. See "ONL TTB-3041 T15_Harmonic emission limits_PP_v2".
P4: "OWFs. Therefore the OWF shall take care of the withstandability of their equipment" Please add: According EMC/EMI IEC standards. Other levels will increase the costs and will require new developments(outside the standard)	WS09	Feedback was received after closing date of the topic. See "ONL TTB-3041 T15_Harmonic emission limits_PP_v2".
P4: "The necessary measures to be taken by the OWF to fulfil the requirements with respect to the harmonic distortion, are the responsibility of the OWF." In case this is responsibility of the OWF, the required place for filtering needs to be given in the platform. Another solution, like local filters on each WTG would increase costs unnecessary.	WS09	Feedback was received after closing date of the topic. See "ONL TTB-3041 T15_Harmonic emission limits_PP_v2".
P7: Please apply some factor of simultaneity to the planning limits, as not every turbine will produce the harmonics at the same time and with the same angle.	WS09	Feedback was received after closing date of the topic. See "ONL TTB-3041

		T15_Harmonic emission limits_PP_v2".
<p>Model, simulation requirements:</p> <ul style="list-style-type: none"> We strongly recommend a document describing in all details the models and simulation-studies TenneT requires from the Offshore Wind farm and a delivery schedule for these infos until 1st Dec. 2015 because we need this essential information for the contract with the WTG-supplier. 	WS09	Feedback was received after closing date of the topic. See "ONL TTB-3041 T15_Harmonic emission limits_PP_v2".
<p>Impedance and frequency loki of grid connection for harmonics:</p> <ul style="list-style-type: none"> We would need the frequency loki of the grid connection for harmonics simulations until 1st Dec. 2015 in order to evaluate the suitability of the WTG-suppliers until the bid. 	WS09	Feedback was received after closing date of the topic. See "ONL TTB-3041 T15_Harmonic emission limits_PP_v2".
<p>Annex 4 to CTA: 4) Harmonic emission limits</p> <ul style="list-style-type: none"> Following leads to too pessimistic harmonic level assumption, because the phase angle between the different WTG-emissions is not reflected: "If more than one Offshore PPM is connected to one single 66 kV bus bar, the emission planning level will be distributed proportional to the rated power of each Offshore PPM." This is not according the IEC-Standard and should therefore be justified. 	WS09	Feedback was received after closing date of the topic. See "ONL TTB-3041 T15_Harmonic emission limits_PP_v2".

Other feedback related to the legal agreements are treated in the legal topics Q&A table.