FEEDBACK REPORT

STAKE HOLDER CONSULTATION PROCESS OFFSHORE GRID NL	
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QUALITY CONTROL		
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Please note that the intention of this feedback report is to illustrate the overall discussion and results. The text should be placed in the greater context of transparency about TenneT 's consultation process. This text is not legally binding and could be modified during the stakeholder consultation process.

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1. Moments of feedback

Feedback	Abbreviation
Expert meeting 27.11.2014	**EM01**
Expert meeting 15&16.04.2015	**EM04**
Expert meeting 12&13.05.2015	**EM05**
Expert meeting 02.07.2015	**EM06**
Consultation website April	**WS02**
Consultation website May	**WS03**
Consultation website July	**WS04**
Bi-lateral meetings	**BL01**

2. Feedback and action

Feedback	Feedback moment	Action
The proposed approach was not challenged.	EM01	Notification
We have concerns on standardising PPM inter-array system. This also depends on the design philosophy of the developer. In the case the developer wants more protection what would be done? Different developers have different protection philosophies. What to do if this deviates from TenneT's standard? Main protection of cable system but also serves back-up protection of the transformer of the wind turbines. Would TenneT be open to add different functions to the protection system? Otherwise we have to add this to the wind turbine and that will be more expensive.	EM04	Incorporated in "ONL 15-080-T6_Protection_PP_v2"
We use differential protection. Does TenneT want to be responsible for switching of the PPM switch gear? In the case TenneT is responsible for protection we should also talk about responsibility for primary equipment.	EM04	See "ONL 15-080-T6_Protection_PP_v2"
How does TenneT being responsible for switching switch gear during commissioning	EM04	Part of connection agreements. Also, refer to PP T.13

work?		
We have never seen the situation from this – never seen different owner of switch gear and protection.	EM04	See "ONL 15-080-T6_Protection_PP_v2": both 66 kV switchgear and protection on the platform will be owned by TenneT. WPO will be consulted on the primary protection of this switchgear. Also WPO will be given the opportunity to specify additional protection requirements.
It would be necessary to define from our side which protection we think is necessary	EM04	Noted
What happens in the case the protection relay is failing? Who is responsible? This should be addressed during the legal consultation and should be specified in agreement.	EM04	Part of legal framework
Before protection will be tendered by TenneT the developer for first tender round is already known – therefore we can be in touch on further specs. We can make a reservation in the design and fill in the potential additional protection by choice of developer.	EM04	Incorporated in "ONL 15-080-T6_Protection_PP_v2"
I don't see the reason in why TenneT is protection our assets. There should really be a possibility to have differential protection. What is the reason TenneT wants to protect our equipment? > access to the platform, better coordination of activities of the platform; reduce PPM's activities on the platform.	EM04	See "ONL 15-080-T6_Protection_PP_v2": For the 66 kV switchgear on the offshore platform, WPO will be consulted on the protection of their inter-array cable bays and will be given the opportunity to specify additional protection requirements. Although not foreseen at this moment, differential protection of the inter-array cabling is possible if required by WPO.
I don't see the issue on who owns the protection. It is only a legal issue in case of failure due to TenneT's maintenance or other causes and that should be defined in the legal agreements.	EM04	Noted
I can also imagine the Project developer wants information from the protection system.	EM04	Incorporated in "ONL 15-080-T6_Protection_PP_v2"
Who will provide the earthing of the system and will TenneT also be responsible the integrity of the system?	EM04	TenneT will provide this and is responsible
TenneT wants to standardize the protection on	WS02	Incorporated in "ONL 15-080-

all platforms including, this might be okay if requirements of Windfarms are fulfilled. If not, a standard should implemented that can be upgraded by the requested protection functionalities.		T6_Protection_PP_v2"
If TenneT will own the protection system the protection system technology and the cost sharing should be discussed. E.g. the design of the protection system technology has impact on the choice of a)disconnetors or b)circuit breaker or no switching possibilities for the single cable sections of a string. E.g. differential protection suggests circuit breakers.	WS02	Incorporated in "ONL 15-080-T6_Protection_PP_v2"
We would like to emphasise the legal issue with regards to liability aspects in the case that the protection fails and the WPO is faced with a lot of consequential cable damage.	WS02	Part of legal framework
Protection: The protection design should be made so that the 66kV feeder protection provide full primary and back-up protection of the entire string as well as back-up protection for the WTG MV system and transformer. A standard protection concept should thus include more protection functions than the overcurrent and earth fault protections outlined by TenneT Our standard protection will as minimum include eg distance relays. Additional protections in order to provide back-up protection of the WTG may also be needed.	WS03	Noted
Space requirements will be given later.	WS03	Incorporated in "ONL 15-080-T6_Protection_PP_v2"
The system is earthed through an earthing transformer connected to the MV bus-bar. How will TenneT ensure the integrity of the neutral earthing to guarantee proper protection of the wind farm and protection against overvoltages? Due to the risk of overvoltages we prefer fast tripping in case of earth faults.	WS03	WPO will be consulted in the protection settings on parts of platform 66 kV GIS including tripping time. This will include earthing transformers. Earthing transformer design will be based on a capacitive voltage factor of 1,4 which results in a maximum earth fault current of about 7 kA (final current subject to detailed calculations).

Protection Setting: TenneT shall ask wind farm developer for fault level at the WTG / array cable for their protection setting calculation. Wind farm developer will verify their setting to see settings are correct for our asset.	WS03	The procedure to come to protection settings will be determined in a later phase.
Legal aspect: We agree that the legal aspects of TenneT providing the protection of OWF assets need to be discussed and included in the connection agreement.	WS03	Noted
It is understood that TenneT (under their proposed ownership boundary) intends to supply the array cable protection which will trip the TenneT owned breakers that connect the array circuits. Is this understanding correct ?	BL01	Yes, this is correct.
Under Tennet's model we would wish to be in full control of the specification of the protection systems which protect the OWF array circuits (obviously including compliance with any Grid Code requirements).	BL01	See "ONL 15-080-T6_Protection_PP_v2": For the 66 kV switchgear on the offshore platform, WPO will be consulted on the protection of their inter-array cable bay and will be given the opportunity to specify additional protection requirements.
In the position paper V2 TenneT mention that one protection philosophy can be applied to all platforms and that it is possible to standardize the functional requirements. However, it is also said that TenneT will agree protection scheme with the individual PPMs. Please confirm this more clearly in the position statement. Based on feedback at previous meetings it appear that developers have even very different protection philosophies. As previously agreed, TenneT will provide space for additional protection (such as distance protection) subject to agreement with OWF. TenneT should clarify that any additional relays agreed with the OWF will also be owned and operated by TenneT.	WS04	Noted
Fault ride through capability is one of the stability criteria for grid compliancy. This should be part of a separate document with	WS04	Noted

requirements for Grid Compliancy.		
Please clarify that the WTG/OWF protection system is operated and owned by TenneT? Furthermore no comments.	EM06	Confirmed