FEEDBACK REPORT

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QUALITY CONTROL		
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1. Expert Meeting 27.11.2014

N.A.

2. Expert Meeting 29.01.2015

N.A.

3. Expert Meeting 18.03.2015

N.A.

4. Expert Meeting 16&16.04.2015

TenneT's design considerations (at this moment) are:

- Unmanned platform;
- No helideck
- WPO access to platform only when accompanied by TenneT representative;
- Access to platform for fault location measurements will always be possible (max. response time to be defined)
- Transportation of personnel by TenneT or WPO vessel
- Minimize need for WPO access by limiting WPO equipment on offshore platform. This will be covered in: T.6 Protection; T.8 / T.10 SCADA / Data links / communication; T.9 Metering

Feedback from the meeting attendees:

You are missing out on the possibility of using the platform for O&M purposes of the WF. In Denmark the helideck is also used for O&M service for WF.

This will be a challenge - last winter 87% of the time the platform was not available due to CTV limitation and no helicopter platform.

I don't see how you can manage and maintain a platform without helideck.

We have wind farms at 20km offshore and 40km offshore without helideck. They have different O&M arrangements and are still looking for the optimum O&M strategy. We would like to maintain flexibility and would therefore opt for a helideck.

Helideck is only 2 million. So why are we having this discussion.

We have a windfarm at 50 km offshore and no helideck. But the size of the wind farm is smaller.

Why is the position on access to platform different with TenneT Germany? [by helicopter only and not CTV].

What is your availability objective for the platform? [TenneT]: ~98%

TenneT requests to provide numbers on accessibility and results on influence and prices of helideck to support input of current study?
Does this mean that if we can provide numbers on why a helideck would be beneficial to the cost of the wind farm would this be reflected upon? [TenneT] yes please provide numbers and arguments.

If you lose the platform you do not only lose production but also you also cannot provide electricity to the WTG. Therefore damage to the WTG will occur. Who is taken that risk? Please check with your colleagues because there has been a platform from TenneT which has had a total black out during the commissioning.

In Denmark we have full access to the platform. We have to inform the TSO and follow the agreed safety rules and after that can access the platform. This works well.
In Germany it is the other way around. Platform is owned by WF operator and TenneT only has access while being accompanied by WF Operator.

We need to have access and will have to agree on how we adopt your safety rules. In the UK we have an interface agreement with TSO in order to access platform.
Does this also takes into account subcontractors: yes they sign and comply with the same rules.

The good news is there is access and in which way this is organised is a formality. Good that access can be granted.

5. Expert Meeting 12&13.05.2015

Summary of concerns based on feedback during the Expert Meeting

- One of the concerns are the HSE issues with regards to a heli hoist and heli deck. This should be further investigated and included in the study
- OWF would like to know what the increase of redundancy compared to added investment by TenneT would be

Feedback from the meeting attendees

How do we arrange access to rooms we (OWF and TenneT) should both have access to? 'other areas' will have to be accessed under accompany of TenneT.

Will there be separate rooms if the two connected WF are from separate owners? OWF would prefer separate rooms with separate access.

Will there be room for DTS communication and would that be the same room? TenneT makes one room available and the OWF has to let TenneT know what is needed in space.

Good; specs will be provided by OWF. Plus some topside room is needed as well (for meteo station, cameras, LIDAR etc) is that also relevant for this paper? No you can access this from the outside.
OWF: but TenneT will have to provide some sort of access to the topside

What happens if OWF has to service cable measurements or has an event on equipment which is not inside our room? [TenneT] then the visit has to be combined. [OWF] this could be on short notice and within short reaction time e.g. tree days. Could you agree on reaction time? We will have to look into this and will have to arrange for that. Emergency crew also needs to be available for TenneT and is also available for OWF. Response time will be included in the connection agreement. Please provide your (OWF) general response time. OWF will investigate internally and will get back on this during next expert meeting.
Is the heli-hoist the only way and/or primary way of accessing platform or do we use the heli-hoist is an emergency access.

We also use the heli-hoist is for (medical) emergencies only.

Is access by CTV possible as well? Yes.

TenneT is currently executing a study on the helideck. Amongst platforms within 30km offshore 75% don't have a helideck.

Principal access method is CTV not heli.

The bigger the WF the bigger the financial effect of downtime of platform. According to my colleagues there was not question on why not to install a helideck with this size of WF at this location.

Heli-hoist can be used in case of an emergency. OWF: yes but a medical emergency is something else than a technical emergency. For non-medical emergencies hoisting is seen as a non-preferable way of access.

We would suggest to make a cost benefit analyse. TenneT has made a comparison and the investment of a helideck will add to the redundancy but will not pay off.

This does not only concern the primary system on platform but also your ancillary system. For instance- HVAC, fire detector. If this is not working we need to shut down or have people out there 24/7.

Is the study also looking into improvement of HSE. Helideck also has large HSE risks, landing a helicopter is one of the most dangerous actions offshore. Please also assess negative effects in your study.

Two OWF would never develop this platform without helideck.

Could we get access to the comparison study? We (TenneT) have looked into two main components: cable and transformer offshore. These are major influence factors and we have compared outage probability and outage time to the non-availability of electricity transmission.

Have you also taken into account the fact that many more things go wrong offshore compared to onshore? You should also calculate what extra availability you gain if you add a heli-deck to CTV and heli-hoist?

What is the definition of an emergency? Is unplanned maintenance an emergency or only medical/dangerous cases and emergency?

Who is making the decision heli-deck or not? Is it TenneT or is it a social capital issue (with regards to financial compensation)? Is it free for TenneT to decide or the ministry?

6. TenneT stakeholder consultation website April

We don't agree on the rationalities behind TenneT position, the safety aspects of the OWF/PPM using the TenneT platform helipads for set-down of maintenance crew, and the availability of SCADA rooms for the generators systems on the platforms. Both issues will lead to extra costs and potentially to lower safety, and the potential need for placing SCADA systems on land and distributed in WTGs will mean that new technical solutions will have to be developed.

It doesn't seem that allocating a room to Generator in the OSP can disrupt the standardization of the platform. But if TenneT wants to keep this new way of operation, then a new design in SCADA has to be developed. See further comments to T8 SCADA.

The Danish concept

The Danish set-up is different. As we understand the Dutch government has chosen what they call the 'Danish model' for offshore wind this may serve as good reference.

In Danish projects the PPM first of all does own equipment on the platform such as:

- *Earthing resistors for the MV system*
- *MV switchgear and array cable systems*
- *Communication and SCADA*
- *Aux. supply panels etc.*
- *Specific rooms are allocated to PPM equipment.*
- *The PPM has unlimited access to the platform 24/7 to the complete platform. The TSO control room need to be advised at arrival.*
- *Helideck can be utilized for transport of personnel.*

All the above is governed by an Operation Agreement which also regulates safety procedures, coordination, responsibilities, etc. etc. and works well.

Access to the platform must be possible, e.g. to operate & maintain SCADA, communication and failure diagnostic on cables etc. Availability via CTV is not sufficient. Eg. for German project, during last winter we have seen up to 90% WoW. Helideck is needed to ensure fast reaction in case of failures. E.g. one day outage can cause feed in losses far above the costs for a helideck.

7. TenneT stakeholder consultation website May

It's important to have well defined response time to expect from TenneT both for planned maintenance and in case of faults.
In case of faults a response time no longer than 8 hours is preferred.
Also if TenneT must be present at all times during developers access to the platform, it is important that TenneT have enough manpower to attend a situation that arise with short notice and that could extend to an offshore operation that could last 36 hours continuously.

In the abstract of the CAP437 (Standards for Offshore Landing Areas, www.caa.co.uk); Chapter 11 winching (hoist) operations is clearly stated that a hoisting area is not a normal method of transfer.
We propose to use a helicopter landing area (deck) for the transfer operation.

1. TenneT stakeholder consultation website June

For the decision on whether or not to install a heliplatform [We] advise to do a cost benefit analysis and share it with the market.
Space and access to that space is needed for the equipment described below in the feedback on topic T8.
Response time needs to be agreed upon.

Other spaces (such as 66 kV infield spaces) are only accessible under supervision of TenneT. A response time for TenneT should be agreed on. What response time for TenneT is found reasonable by OWF?
Eight hours is considered as long if the response time is the time between the occurrence of the failure and the presence on the OHVS, especially when the complete wind farm is down. If a Heli Hoist is considered a shorter response time seems possible and desirable.
This issue can also be solved by appointing people in the OWF organisation that are allowed to access and enter the spaces under consideration without the supervision of TenneT.
Third parties on land (provided they are sufficiently qualified and educated) also have access to TenneT stations.
This requires a working permit and a reporting requirement.

Are there any specific HSE topics requiring special attention in this phase?
OWF proposes to refer to the 'Arbocatalogus Windenergiebedrijven' when establishing HSE requirements. The basic safety rules for working in offshore wind farms are already included in there. Possible additional

rules can be added later when TenneT also becomes a member of the working group.
Additional important points of attention are:
-Adequate fire extinguishing system, preferably without a choking agent but with a water spray.
-Rapid evacuation of multiple persons in case of fire e.g. by using a chute.
-AED and First AID equipment present on the platform, to prevent that the CTV has to take this along every time.
-Adequate coordination between the works of different teams.

What is the opinion of OWF on the discussion on access to platform with a CTV and emergency access through a heli hoist.
OWF thinks that an important breakdown is an emergency. Therefore a Heli hoist should be possible in such situations when CTV access is not possible.
The platform is a heliport when heli-access to the platform is possible with a Heli deck. In that case also the required space that one is prepared to reserve is important (concrete: obstacle free zones throughout the wind farms). No high expectations should exist given the limited space within the areas.
With regard to CAP 437 it is important that TenneT discusses timely with the 'Inspectie Leefomgeving and Transport (V&W) to determine under which regime the flight paths to and away from the platform will be assessed. After all, it concerns new heliports.
The OHVS of our WF1 WF2 is accessible through winching out of a helicopter. The space requirements of a winch area is less and a lot less demanding than a landing spot. Then the it is also not a heliport, so no flight paths to and away from the platforms have to be determined.
High expectations should not exist of this, there is just one helicopter which can perform this type of hoists. In case of high winds this heli is largely used for depositing sea pilots. It could be possible that an expansion of the helicopter fleet is considered when the activities of Wind op Zee are expanded.

Which requirements does OWF have with respect to communication with shore?
OWF proposes to provide IP-telephones in every space which will be connected with the public telephone network on land. In this way it will always be possible to call someone onshore from the platform.
Additionally, UMTS within the wind park is very practical since the O&M crew can just use their cell phones.
Additionally with respect to maintenance, it is very desirable to have WIFI in every space the platform. Maintenance personnel is increasingly making use of e.g. tablets to check online drawings etc.

2. Bi-lateral meetings

It is assumed that the OSP location is fixed. TenneT should clarify if this is the case and provide detailed rationale for choice of location to potential bidders.

*Irrespective of the final ownership boundary at the OSP the developer should be provided access to the OSP. Even with the proposed ownership boundary suggested by TenneT (array cable sealing ends) the wind farm owner will require access to their equipment (even **if** just cable sealing ends). For example, if a failure occurs at a cable sealing end it is not credible that the wind farm owner is unable to inspect their damaged asset. Placement of an O&M contract with TenneT for wind farm owned assets on an OSP, if agreed upon, does not remove the assets owner's requirement for access.*

It is noted that TenneT require and have access to developers' OSPs in Germany. Similarly, in the UK developers' have access to the TSOs' a.c. OSPs.

Access also presents HSE&S benefits, e.g. safe haven.

3. Other

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