Norfolk Vanguard Offshore Wind Farm

Consultation Report

Appendix 9.25 Onshore Noise Minutes Pre-S42

Applicant: Norfolk Vanguard Limited
Document Reference: 9.25
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Meeting Title: Noise and Vibration

Meeting Date: 20/07/2017

Meeting Location: The Union Building, 51-59 Rose Lane, Norwich, NR1 1BY

Attendees:
Sophie Thompson (RHDHV) (ST)
Ruth Henderson (RHDHV) (RH)
Kathy Wood (Vattenfall) (KW)
Rob Driver (Vattenfall) (RD)
Sue Hammond (Breckland Council) (SH)
Donna Laubscher (North Norfolk District Council) (DL)
Sally Nicholson (North Norfolk District Council) (SN)
Dean Curtis (RHDHV) (DC)
Mark Smith (RHDHV) (MS)
Andrew Hardcastle (GHD) (AH)

Apologies:
Matthew Rooke (Broadland District Council)
Tony Garland (Broadland District Council)
Geoff Lyon (North Norfolk District Council)
James Wilson (North Norfolk District Council)
Mike Brennan (Breckland Council)
Debi Sherman (Breckland Council)

Next meeting date: TBC

Minutes:

Attendee	Comment	Action
1. Introduction		
1.1	KW provides H&S information and goes through introductions.	
1.2	KW provides aim of the meeting to provide an update on the project, and to agreement and feedback on going forward.	
1.3	RH goes through agenda.	
2. Consultation update		
2.1	RH provides update on Scoping Report completion and Expert Topic Group (ETG) meetings to date.	
2.2	S42 to be submitted Q4 2017. Development Consent Order (DCO) application to be submitted in Q2 2018.	
2.3	RH runs through work to date on project since last	

Attendee	Comment	Action
	meetings – surveys, public consultation, landowner discussions, Preliminary Environmental Information Report (PEIR), newsletters etc.	
3. Norfolk Vanguard Update		
3.1	RH runs through refined project areas.	
3.2	**Landfall** RH runs through the key reasons for choosing Happisburgh South as the preferred landfall location. SN raises the issue of erosion at Happisburgh. AH explains that the coastal erosion study will give us enough information to ensure the set back and drill profile avoids potential future erosion exposing any assets.	
3.3	**Cable relay station** RH explains why cable relay station search zones 5 and 6 are currently being considered for siting co-located cable relay stations for Norfolk Vanguard and Norfolk Boreas.	
3.4	**Onshore cable corridor** RH explains that the consent will include a 100m wide corridor. Currently 200m wide. Trenchless crossing techniques are being considered for various crossings including main rivers, landfall etc. PS asks about the air quality and particle emissions and how that is being assessed. RH explained there is a separate air quality assessment, and a Health Impact Assessment report which will be available at the PEIR stage, which will bring together topics such as traffic, air quality etc.	
3.5	**Onshore project substation** AH explains that the onshore project substation refined from 3km area to smaller area close to Necton with 4 co-located (Norfolk Vanguard (NV) and Norfolk Boreas (NB)) options. By the time of the DCO application this will be refined to one onshore project substation location. SH asks if the substation footprints include the entire compound.	**ACTION: Circulate slides but add Dudgeon compound to the substation options figures.**

Attendee	Comment	Action
	AH confirms this is the case and runs through the footprint options. SH suggests adding the Dudgeon substation footprint on the figures for comparison. A discussion was had clarifying the High Voltage Alternating Current (HVAC) / High Voltage Direct Current (HVDC) solutions and the assessment of both.	
3.6	**Assessment scenarios** RH runs through HVAC and HVDC assessment scenarios and phasing options.	
4. Noise and Vibration		
4.1	**Actual survey locations and amended methodology** **Onshore substation** DC runs through original survey methodology for the baseline noise surveys. Substation locations were proposed to have week (7 days) long monitoring. DC runs through weather monitoring, data validation/calibration. Decision to take attended measurements for 1 hour and then 2 non-consecutive 15 minute night time samples (11pm and 2am).	
4.2	**Onshore cable corridor** Surveys were undertaken for half an hour in the daytime and 15 mins at night time. SH asks about night time construction activities. AH confirms that some drilling activities for trenchless crossing techniques might need to occur overnight.	
4.3	**Cable relay station** DC explains that access limitations for some locations, however the data collected is representative. Attended measurements occurred during the day and night time to ensure some data for the receptors. Up to seven days data.	
4.4	**Landfall** DC explains receptor positions, and attended measurements during the day (up to 30 minutes taken twice) and night (15 minutes).	
4.5	**Results from baseline noise monitoring surveys**	

Attendee	Comment	Action
	DC runs through analysis for the data measurements and the results at substation, cable relay station, landfall and cable corridor.	
4.6	**Construction** DC runs through how the construction phasing has been considered in the assessment. The worst case of assuming plant associated with the installation of the ducts along the cable corridor will be at the extent/nearest point to receptors of the 200m cable corridor width. SN asks how long a stretch of trenching can be done at one time. AH explains the approach to the mobilisation areas, and a 100m length (1 week) at a time before moving to the next section, with multiple work fronts at any one time.	
4.7	**Construction equipment** Indicative equipment and the assumption is the plant will be under the worst case (at the closest point to the nearest receptor).	
4.8	**Operational modelling** Rigs operating at the closest point to the nearest receptors (worst case scenarios) and consistent approach. Also assumes that drilling and plant are operating at the same time. DC notes that the results at this stage are unmitigated. HVAC is considered the worst case due to the requirement for the cable relay station and is based on both cumulative and independent scenarios. Expectations of the plant noise on site for HVAC is conservative. Indicate layouts of the sites, size of plant and location on the site, were also taken into account. Cable Relay Station to be modelled in accordance with BS4142:2014 to determine potential impacts.	**ACTION: DC check traffic assessment for peak hour flows.** **ACTION: RHDHV follow up meeting with Vattenfall to discuss Operational Phase assumptions.**
4.9	SH asks for clarification that figures for operational noise are based on housed structure. MS confirms this is the case.	

Attendee	Comment	Action
	DC notes that remodelling will occur when other potential designed-in mitigation are known (e.g. topography, berms etc).	
4.10	SH asks for clarity on the noise levels expected at the National Grid substation. AH confirms the National Grid extension works include passive equipment only (operational phase).	
4.11	DC runs through the traffic noise assessment, based on existing total flows and change in HGV levels, in accordance with DMRB (Design Manual for Roads and Bridges), and the potential dB (decibel) change and what significance it has. Maximum is 2.7dB change (categorised as minor). DC explains this is a small short term impact on a small number of routes. This is based on version 2 of the traffic data. Another version (3) of the traffic data will be screened shortly as a result of the Traffic and Transport Expert Topic Group (18th July 2017). PS asks if these changes are done at any one time or dependent on the frequency. DC explains that these are based on 18 hours traffic flows. Annual average weekday traffic flows as the basis for the CRTN (calculation of road traffic noise).	
4.12	SN asks about deliveries. AH confirms these will be throughout the day. However delivery of large plant will only occur at the start of the construction. PS asks if these deliveries will be considered in the air quality impacts. RH confirms this will be considered in the air quality assessment.	
4.13	**Dudgeon** DC asks if the condition 35dB (32dB linear) for the Dudgeon substation would be the potential benchmark for the Norfolk Vanguard. SH confirms that no threshold shift is expected. DC notes that some assessment work has been done for Dudgeon to date and a commissioning report produced. SH confirms this, but that a full capacity report has been requested. DC discusses the survey at Dudgeon. The experience	**ACTION: SH to send over the Dudgeon condition in relation to noise limits.**

Attendee	Comment	Action
	was of low levels of noise. RD asks if the transformers at Dudgeon of are in any enclosures. DC confirms that enclosures were used at Dudgeon. SH notes that this will be of benefit as the noise has been lower than expectations of local communities. SH explains that the noise levels were set for Dudgeon based on the Little Dunham site, and the nearest receptor was much nearer at Little Dunham.	
4.14	**Confirmation of noise sensitive receptors** DL asks how close the nearest receptors are to the cable relay station options. The group viewed the nearest receptor at Summers Farm to cable relay station option 6b (approximately 200-250m to the field boundary and 250-300m to the edge of the footprint search zone for option 6b).	
4.15	SH asks if the modelling will be attempting to achieve the condition for Norfolk Vanguard, but what are the considerations for Norfolk Boreas. DC confirms Norfolk Boreas will be included in the assessment, and within the Cumulative Impact Assessment (CIA).	
5. Next meeting/AOB		
5.1	SN confirms herself as point of contact at North Norfolk District Council for Norfolk Vanguard going forward.	
5.2	KW notes the preference for the local community to undertake a site visit. This will be discussed further with the Vattenfall Local Liaison Officer, Sue Falch-Lovesey (SFL).	**ACTION: KW/SFL to get in touch with SH regarding a site visit.**
5.3	SN asks about the low frequency noise levels. DC confirms this is the reason for the 100Hz condition and will be considered in the assessment. Dudgeon has been shown to achieve this limit.	
5.4	SN asks about the issue of vibration. MS confirms this is part of the construction assessment. DC notes that for operational vibration, this is built	

Attendee	Comment	Action
	into the design. AH notes that Vattenfall are still investigating any piling requirements for the substation and cable relay station. SN notes piling of housing development at Overstrand and the intrusive nature of it.	
5.5	SH asks if a substation is likely to get noisier as it gets to full power. RD explains that this will only potentially change for the transformers but not the reactors.	
6. Summary of actions		
6.1	**ACTION: Circulate slides but add Dudgeon compound to the substation options figures.** **ACTION: DC to check traffic assessment for peak hour flows.** **ACTION: RHDHV follow up meeting with Vattenfall to discuss Operational Phase assumptions.** **ACTION: SH to send over the Dudgeon condition in relation to noise limits.** **ACTION: KW/SFL to get in touch with SH regarding a site visit.**	

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Meeting Title: Noise and Vibration

Meeting Date: 14/09/2017

Meeting Location: Telecon

Attendees:
Sophie Thompson (RHDHV) (ST)
Rob Driver (Vattenfall) (RD)
Sue Hammond (BC) (SH)
Dean Curtis (RHDHV) (DC)
Mark Smith (RHDHV) (DC)

Aim of meeting:
Follow up from July ETG meeting, to discuss the most appropriate approach for determining noise conditions at the onshore project substation for Norfolk Vanguard.

Minutes:

Attendee	Comment	Action
1. Dudgeon cumulative impact		
1.1	A discussion was had on the potential cumulative noise impact with the existing Dudgeon substation. Public register information not sufficient. The documents covering the commissioning operational assessment and planning conditions are not publically available. Modelling using the Dudgeon Environmental Statement chapter data would introduce uncertainty and inaccuracies without the latest operational reported levels.	
2. Approach for Vanguard		
2.1	**DC** gave an example of the approach taken for East Anglia Offshore Wind (EA1 and EA3) i.e. each site adhered to an independent 35dB limit; however at detailed stage this level was changed to be 35dB cumulative for all schemes in the area.	
2.2	At this stage the most appropriate approach is considered to be BS4142 – this takes into account existing background noise level, includes component from Dudgeon's operational noise levels. It's thought to be more robust, might help avoid scrutiny from peers further down the line. **DC** explained that the BS4142 standard is the current best practice guidance and would be the approach that is used industry wide.	
2.3	Discussed proposed conditions taken from email	

Attendee	Comment	Action
	received from Sue Hammond to Royal HaskoningDHV (dated 29/08/2017 11:08): 1. The noise rating level (defined as set out in BS4142) from the operation of the substation shall not exceed 35 dB LAeq (5 minutes) at any time at a free field location immediately adjacent to any noise sensitive location. 2. Noise from the operation of the substation shall not exceed a limit value of 32dB LLeq (15 minutes) in the 100Hz third octave band, at any time at a free field location immediately adjacent to any noise sensitive location. 3. Prior to the operation of any part of the site, the developer shall submit a scheme to be agreed in writing with the Local Planning Authority, for monitoring compliance with the above noise conditions. The scheme to include identification of suitable monitoring locations(and alternative surrogate locations if appropriate) and times when the monitoring is taking place to demonstrate that the noise levels have been achieved after both initial start-up and six months of operation. 4. In the event of the local planning authority receiving a complaint of noise from the development hereby approved, the operator shall, at its own expense undertake a noise survey to ensure the above noise conditions at the nearest noise sensitive locations are continuing to be met.	
2.4	**SH** explains that because the limit is 35dB for Dudgeon, if the next substation limit is also 35dB, this can actually lead to 3dB higher cumulatively. The wording of the condition needs to be realistic and enforceable, but also to give confidence for local residents. SH indicated she would be comfortable looking at ideas and options for the condition wording. **DC:** There are two scenarios in modelling. First scenario modelled everything (incl. Dudgeon). However there are difficulties with data as explained	

Attendee	Comment	Action
	in paragraph 1.1. Baseline readings were taken in May which will form the basis of the BS4142 assessment. **SH:** Modelling is fine, using background is fine. Want to maintain maximum noise with Dudgeon is not higher than 35dB. **RD** summarises that the BS4142 approach is acceptable by Breckland for maintaining within 35dB on cumulative basis for Vanguard and for Boreas. **SH** raises the practicalities of 4142 approach. **MS:** When Dudgeon is fully operational background levels would actually be slightly higher so wouldn't need so much mitigation to meet this. **DC:** Aspect of cumulative with Norfolk Boreas has been covered. 35dB absolute threshold. **SH** confirmed acceptance of approach is considered the most appropriate.	
3. Summary		
3.1	**DC** explains that at this stage based on the information currently available (regarding site layout, proposed plant, current technology), we propose to model and predict the impacts against existing background using the BS4142 methodology. It would also be astute to consider impacts in conjunction with the proposed conditions highlighted above, namely a 35dB criteria and 32dB linear cumulative for any other schemes (e.g. Norfolk Boreas). Same background level will be used in the BS4142 cumulative assessment reported in the PEIR chapter for Norfolk Boreas. Highlighted that the modelling is based on the current design and existing details of proposed plant associated with the Norfolk Vanguard and Norfolk Boreas scheme. As such a precautionary approach has been taken using indicative plant. The levels reported are likely to be higher than what would be expected as the final detailed design evolves. The overall layout and associated operational phase plant may be subject to change at the detailed design stage taking into account Best Available Technology and any embedded mitigation. Mitigation of any predicted	

Attendee	Comment	Action
	impacts will be considered and an outline approach identifying potentially suitable methods will be discussed in the PEIR. **SH:** For PEIR model Norfolk Vanguard independently and cumulative with Norfolk Boreas. **RD:** Agrees, but explains that design will be outline at this stage for PEIR.	