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NORFOLK BOREAS OFFSHORE WIND FARM

Planning Inspectorate Reference: EN010087

Deadline 6

**Natural England's comments on Norfolk Boreas approach to as-built vs
consented turbine numbers and headroom in cumulative/in-combination
collision assessments**

5th March 2020

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1 Summary

Natural England acknowledges the work that Norfolk Boreas and their consultants have done to consider potential headroom in the in-combination/cumulative collision risk figures by assessing the 'as-built' rather than the worst case scenario (WCS).

However, whilst we recognise that there is likely to be some headroom for the general reasons set out by the Applicant, the exact extent of any potential headroom is not agreed. Until the uncertainties set out below are addressed and an industry wide approach is agreed, Natural England recommends that the default 'standard' approach of using the consented WCS is appropriate.

2 Background to issues

Natural England agrees with the Applicant that the standard approach to cumulative and in-combination assessments is to use the consented parameters of each project and to refer to the WCS assessed within the relevant Environmental Statement (ES) taking account of any updated assessments provided throughout the Examination process.

As offshore wind farms (OWFs) are consented based on the Rochdale Envelope approach, the WCS predicted within the ES's are often different to the predicted impacts from the project 'as-built' i.e. once the design is finalised/constructed. Consequently, the use of collision risk estimates calculated based on WCS may lead to a potential over-estimate of the total cumulative or in-combination assessments in terms of both EIA and HRA. However, it is also possible that the predicted impacts from 'as-built' designs are greater than those predicted in the ES e.g. the collision mortalities at Lincs OWF increased after application of the correction factor used when calculating the impacts of 'as-built' development.

Within REP4-014, the Applicant is seeking to reassess/redefine collision risk for some consented projects where it is considered that the 'as-built' or consented scenarios for projects are different to the WCS's that were originally assessed.

Natural England notes that whilst this is recognised as an issue, it is a highly complex one, and **it is important to note that there is not yet an agreed way forward** at present. This approach has also not been subjected to judicial scrutiny. This is why previous Applicants and decision-makers have largely continued to use the standard approach of referring back to the original assessments in the Environmental Statement, in line with Natural England's broad advice on the matter.

3 Natural England's previous advice on assessed vs consented and as-built

As Natural England has stated previously during the Norfolk Vanguard Examination (see our Deadline 2¹ and 8² responses for that Examination), we consider that in order for the Examining

¹ Natural England (2019) Norfolk Vanguard Offshore Wind Farm: Comments on Offshore Ornithological Aspects of Applicant's Response to Section 51 Advice from the Planning Inspectorate. Available from: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-002461-Natural%20England%20-%20NE%20detailed%20comments%20on%20Offshore%20Ornithology%20S51%20Advice.pdf>

² Natural England (2019) Norfolk Vanguard Offshore Wind Farm: Natural England's Comments on Norfolk Vanguard Ltd. Deadline 7 and Deadline 7.5 submissions in relation to Offshore Ornithology Related matter. Available from: <https://infrastructure.planninginspectorate.gov.uk/wp->

Authority/Secretary of State (SoS) to be able to factor in retrospective changes to the collision figures for projects in the cumulative and in-combination assessments, the Applicant would need to:

- Provide documentary proof that the design envelope used to calculate new collision figures is:
 - Secured through a licensing or legally binding mechanism with no further change possible;
 - In addition, for projects that are not built, it should be demonstrated that the design parameters proposed for any updated Collision Risk Modelling (CRM) do not exceed the consented WCS design envelope for collision mortality of the species of concern.
- For projects where revisions to the turbine design parameters can be used to update CRM figures (i.e. where there is a new design envelope which is secured through appropriate conditions or legally binding commitments), Natural England would need to agree the appropriate model/option and parameters for the updated CRM figures.
- Our advice is that in these circumstances CRM should be re-run to generate updated collision figures against any agreed changes to turbine design layouts. Where this is not possible for a project because the original bird density data cannot be obtained, we would need to agree whether it is possible for correction ratios to be calculated (for example following an approach such as that presented in Trinder (2017)³). Natural England advise that simplistic scaling of collision figures based on reductions in turbine numbers from the consented number should not be used, for example due to variation in flight activity at different heights and differences in turbine parameters such as rotor speeds.

Where these requirements cannot be met, cumulative and in-combination assessments should be based on consented WCSs.

4 Norfolk Boreas's position and Natural England's comments on this

4.1 Assessed vs consented schemes

The Applicant has identified three projects (Hornsea Project One, Triton Knoll and Race Bank) where the figures used in their cumulative/in-combination CRM are currently derived from the WCS assessed, as opposed to the final scheme consented. In REP4-014 (see second paragraph of Applicant's responses on ISH agenda item 7, part b) iii) on CRM of REP4-014) the Applicant notes that:

'In each case either the original Development Consent Order, or a non-material change, or a section 36 variation has reduced the parameters in the consent from what was originally assessed as the worst case. Therefore as for the East Anglia ONE decision, which was discussed at the previous hearing, the Applicant's position is that it is without doubt that headroom has been created by those three projects and that such headroom is "legally secured".'

Natural England agrees in principle that if a non-material change or section 36 variation has indeed reduced the parameters which are consented within/ under the DCO or under the DCO as changed/varied, in such instances this could be considered "legally secured".

However, please note that our understanding is that Hornsea Project One applied for a non-material change which increased their capacity from 1200MW to 1218MW, in order to expand the

[content/pc/uploads/projects/EN010079/EN010079-003121-DL8%20-%20Natural%20England%20-%20Deadline%20Submission.pdf](https://www.naturalengland.org.uk/content/pc/uploads/projects/EN010079/EN010079-003121-DL8%20-%20Natural%20England%20-%20Deadline%20Submission.pdf)

³ Trinder, M. (2017) *Estimates of Ornithological Headroom in Offshore Wind Farm Collision Mortality*. Report to The Crown Estate.

Rochdale Envelope to encompass the number and type of the turbines that the project could install. Nevertheless the Rochdale Envelope still allowed various other configurations and therefore the variation of the consent still allowed the WCS to be built.

4.2 Consented vs as-built

On consented versus as-built, in REP4-014 the Applicant notes (see third paragraph of Applicant's responses on ISH agenda item 7, part b) iii) on CRM of REP4-014):

'... There are a number of reasons why the Applicant considered that the as-built schemes (and their associated parameters) is "legally secured". This is partly due to the way in which the Deemed marine Licence (DML) conditions require approval of final layouts and certification of final layouts on completion of construction. In essence the Applicant's submission is no different to the MMO's and Natural England's recent (draft) advice on cable protection, that new areas of cable protection cannot be installed following certification that construction has completed. This is not least because in the 8 cases which the Applicant has so far considered, the age of the environmental information is now in excess of seven years. As Natural England state in their recent position statement on new areas of cable protection, environmental information which is more than five years old would be considered out of date and updated environmental information would be required. This includes any requirement for a further Habitats Regulation Assessment, which would therefore amount to a material change requiring a new consent...'

In response to the above we raise the following points:

- i. It is Natural England's view that for those projects identified above the marine licence and/or DCO/DMLs do not have a specific requirement to provide information on the as-built parameters upon the completion of construction, or a condition that clearly specifies that the built project becomes fixed for the lifetime of the DCO/DML. In addition, phased builds are challenging in this situation as there were no limitations for the timings of any subsequent phases. Therefore, we believe that such situations remain too ambiguous to definitively state the 'as-built' projects are legally secured.
- ii. The 'age of the data' scenario presented above by the Applicant has never been legally tested, and to do so would require regulatory input. We note that one potential implication of the above argument would be that if an Applicant is going to use this data to re run CRM, there would be inherent issues with the age of the data, how data was collected and compatibility with current survey platforms and modelling approaches. It is plausible that the original surveys may have under/over-estimated abundance, distribution and flight height, but there is no way of quantifying this. So it may be overly simplistic to say there is headroom with certainty. If the above approach is to be taken forward there needs to be a consistent strategic approach agreed in an industry wide forum. Natural England also considers that the developer for the project/s in question should have the 'right to reply' on what they think the as-built collision risks for their project/s are.

4.3 Is there headroom Norfolk Boreas could use?

Please be advised that if the Applicant successfully identifies headroom this does not necessarily mean that headroom is the project's to utilise, as there are currently multiple projects ahead of Norfolk Boreas in the Examination process that are not yet consented.

5 Updated CRM undertaken by Norfolk Boreas for Hornsea Project One

We note that in Appendix 4 of REP4-014 the Applicant has undertaken updated CRM for Hornsea Project One (HOW01) using the Band (2012) model for both the consented (5MW turbines) and the non-material change and subsequently constructed (7MW turbines) layouts, and has included copies of the model input and output spreadsheets for kittiwake. It appears from the information presented that the Applicant has used the bird density data from Table C.164 from the HOW01 Environmental Statement Ornithology Technical Report. Natural England is unclear whether Table C.164 of this document does contain the correct density data used in the HOW01 CRM, as there were several iterations of the CRM through the HOW01 Examination, and during the Examination it was unclear to Natural England where the density data used in the CRM came from, and there were unresolved discrepancies between the figures in the tables presented.

In Appendix 4 of REP4-014 for HOW01 the Applicant has focused on presenting the CRM figures for all layouts for Option 1 of the Band (2012) model. Natural England continues to have several significant unresolved concerns regarding the robustness of the site-specific flight height data used in the CRM of Hornsea projects, and has consistently advocated the use of Option 2 in preference to Option 1 outputs for those projects.

During the Hornsea Project TWO Examination, we note that we used an Option 1 figure with a 98.9% avoidance rate of 122 kittiwake collisions for HOW01 in the Hornsea 2 cumulative collision assessment (which has also been used in both the Norfolk Vanguard and Norfolk Boreas cumulative kittiwake collision assessments). We note that HOW01 did updated CRM assessments based on 174 x 7MW turbines in the non-material change application and they had already done various iterations of 240 x 5MW turbines during the HOW01 Examination. Natural England is therefore unsure what the Applicant's updated Band CRM assessments for HOW01 in Appendix 4 of REP4-014 represent. Therefore, due to the uncertainty in the CRM assessments undertaken and agreed for HOW01, we believe there is a high risk that the Applicant's assessments of Headroom in REP4-014 could be incorporating significant errors such that there may not be sufficient headroom.

We note that paragraph 7 in Annex 1 of Appendix 4 of REP4-014 suggests that the turbine parameters presented in Table 1.3 - and hence used in the revised CRM for the 174 x 7MW turbines - come from the HOW01 non-material change document. However, we note that the predicted kittiwake collision figures that HOW01 calculated for 174 x 7MW turbines for the non-material change are different to those presented by the Applicant in Appendix 4 of REP4-014, and we seek clarification regarding this. We are also uncertain of whether the 7MW turbine specifications presented in Table 1.3 are the exact specifications of the 7MW turbines that have actually been built at HOW01. If this is not the case, the revised CRM may not actually reflect the 'as-built' turbines. This would also apply to the adjusted figure from the approach developed for The Crown Estate by MacArthur Green.

6 Use of approach developed for The Crown Estate by MacArthur Green

As set out in our response to Examining Authority question 2.2.38 during the Hornsea 3 Examination (submitted at Deadline 6 of this Examination⁴, dated 7th February 2019), Natural England considers it important to make the overarching point that The Crown Estate commissioned the Trinder (2017) report in order to better understand the potential level of 'headroom' for their own purposes (i.e. potentially to inform their decisions on future leasing rounds) and that it was not the intention that the figures from this report, or the methods outlined within in it, were used to revise the in-combination assessments of current and future applications.

Natural England reiterates the comment made during the Hornsea 3 Examination (at Deadline 6 of this Examination⁴, dated 7th February 2019) that Natural England has not checked the details of the calculation for scaling collisions as set out in Trinder (2017), but in principle Natural England is of the view that the calculation method is valid. However, there are a number of issues which mean that the results obtained will not always be accurate. These include the availability of accurate data on the input parameters used in the original modelling and the actual predicted collision figures eventually arrived at in the course of an Examination, as these may change several times.

Consequently Natural England does not advise that it is used as a method for altering the collision figures of planned and consented projects. We note that during the Hornsea 3 Examination, there was an attempt to update the parameters in Trinder (2017) for some offshore wind farms due to this very issue. However, further errors and/or issues were identified with this update (full details are set out in Natural England's Deadline 6 response of the Hornsea 3 Examination to ExA question 2.2.38⁴, dated 7th February 2019). For these reasons, Natural England does not consider there to be robust evidence available for these corrections. There are also issues regarding the actual turbine specifications for the 'as-built' turbines – in the case of the updates undertaken by the Hornsea 3 Applicant, these were done by simply referencing manufacturer information for particular turbine models as evidence of the 'as-built' layout for the majority of projects. As noted in our Deadline 6 response to ExA question 2.2.38 at Hornsea 3⁴, while these may reflect the actual built turbine parameters for some projects, it is not a sufficiently robust audit trail with respect to an individual project. Therefore consultation with the MMO may be required to obtain the parameters from the construction management plan of each project.

Whilst the Applicant may have demonstrated in Appendix 4 of REP4-014 that taking the approach developed in Trinder (2017) produces the same predicted collision figure as that obtained through recalculation from the original dataset (using the Band spreadsheets) for HOW01, we note that this has only been demonstrated for one project and given the issues noted above, it is likely that this would not be the case for every project.

7 Conclusion

Therefore, given these issues, our position remains that CRM should be re-run to generate updated collision figures against any agreed changes to turbine design layouts. Where this is not possible for a project, because original bird density data cannot be obtained, we would need to agree whether correction ratios can be calculated (for example following an approach such as that presented in Trinder (2017)). Natural England would need to see the full calculation details for these

⁴ Natural England (2019) Hornsea Project Three Offshore Wind Farm – Natural England Written Submission for Deadline 6: ISH 5 Annex G: Natural England's Comments on the Applicant's Response to ExA Q2.2.38 [Ornithology, Cumulative and in-combination Assessment]. Available from: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010080/EN010080-001695-Natural%20England%20-%20ISH5%20Annex%20G-%20Natural%20England%E2%80%99s%20Comments%20on%20the%20Applicant%E2%80%99s%20response%20to%20ExA%20Q2.2.38.pdf>

correction factors. It is Natural England's advice that simplistic scaling of collision figures based on reductions in turbine numbers from the consented number should not be used, for example due to variation in flight activity at different heights and differences in turbine parameters such as rotor speeds. There are also case-specific issues that need to be addressed: Natural England notes that the Race Bank CRM did not use the Band model, being based instead on the Folkerts model (which was also used for Dudgeon).

As noted during the Norfolk Boreas Issue Specific Hearing on 22nd January 2020⁵, Natural England has been raising the issue of whether as-built or consented projects should be considered for in-combination effects with The Crown Estate, and we note the need for a strategic approach to this issue. If conducted simply on a project-by-project basis this has significant risks of inconsistency of approach across applications. Therefore, we consider that this issue needs to be addressed strategically on behalf of the whole sector, including developing consensus on an approach. However we do recognise that this is not possible in the timescale for the Norfolk Boreas Examination.

⁵ Natural England (2020) Norfolk Boreas Offshore Wind Farm: Natural England's Written Summary of Oral Representations made at Issue Specific Hearing 4 on offshore effects including the Draft Development Consent Order. Planning Inspectorate Reference: EN010087. Available from: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-001630-DL4%20-%20Natural%20England%20-%20Written%20Representation%20of%20Oral%20Case.pdf>