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THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE)
RULES 2010

HORNSEA OFFSHORE WIND FARM - PROJECT TWO APPLICATION

International Mainstream Renewable Power Limited and Siemens

Project Ventures for:

The construction and operation of Hornsea Offshore Wind Farm Project Two, a 1,800 MW with up to 360 turbines wind farm located approximately 89km off the East Riding of Yorkshire coast, and 50km from the median line between UK and Dutch waters.

Planning Inspectorate Reference: EN010053

WRITTEN SUBMISSION FOR DEADLINE 2

Dated 10th August 2015

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Submitted as a separate document

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INTRODUCTION

- 1.1 Natural England has already submitted its Written Representations to the Planning Inspectorate on 15th July 2015. Since submitting these representations Natural England has continued to engage with the Applicant to resolve outstanding matters where possible.
- 1.2 This document has been produced in response to material submitted at Deadline I and provides Natural England's response to relevant matters. The document is structured as follows:
 - a. Section A– Comments on the Written Representations (WR) and response to the Examining Authority's First Written Questions
 - b. Section B – Comments on the Offshore Ornithology clarification notes submitted by the Applicant at Deadline I
 - c. Section C – Written submission of Natural England's oral case given at the Issue Specific Hearing on the draft Development Consent order held on 30th July 2015
 - d. Appendix I (submitted separately) – Natural England's position regarding offshore windfarm developers as S28G bodies under the Wildlife and Countryside Act 1981 (as amended by CROW 2000).

SECTION A – COMMENTS ON WRITTEN REPRESENTATIONS AND RESPONSES TO THE EXAMINING AUTHORITY’S FIRST WRITTEN QUESTIONS

The Applicant’s Response to Deadline 1 (dated 15th July 2015)

Part 1 – The Applicant’s Written Representation

- 2.1 Although Natural England has engaged in discussions with the Applicant there are still a number of outstanding matters with regards to the assessment of impacts on designated sites, particularly with regards impacts on ornithological receptors from the operational wind farm. Full details of instances where Natural England currently considers there remains reasonable scientific doubt as to the absence of effect on the integrity of designated sites are provided in our Written Representation.
- 2.2 Natural England does not consider that some sections of the draft Development Consent Order (DCO) and Deemed Marine Licenses (DMLs) are drafted adequately and therefore outstanding issues remain. Please see Natural England’s Written Representation paragraphs 6.6.37 – 6.6.44. Natural England is continuing discussions with the Applicant to resolve these matters where possible.

Part 2 – The Applicant’s responses to Examining Authority’s First Written Questions

- 2.3 **G1** – Natural England would like to highlight that discussions are on-going with the Applicant regarding responsibilities conferred and permissions required under section 28 of the Wildlife and Countryside Act 1981 (as amended). Please see paragraphs 6.6.32 – 6.6.33 of our Written Representations and Appendix I of this document for further information.
- 2.4 **PN2** – On the issue of the relationship between parties involved in the development of Hornsea Project two, in particular between the joint Applicants, Natural England has concerns on the implications of separating the project out between two operators. Any in-combination (sequential and in-parallel) impacts with consented plans/projects, including if the project may be split (post-consent) into more than one project, need to be fully considered in the Secretary of State’s (SoS) Appropriate Assessment (‘AA’). This would need to include impacts arising over the lifetime of the projects. Natural England notes that the Environmental Statement (ES) is based on a single project but the Applicant is proposing to effectively split the project into two separate projects.

In this context, it is unclear whether the ES accurately establishes a reasonable worst case scenario regarding the delivery of the proposal as if it was two separate developments. Accordingly, Natural England does not believe there is enough information in the ES to do an in-combination assessment of the impacts of two separate developments; we have particular concerns over access across and activities within the Humber Estuary SAC and Humber Estuary SPA over the lifetime of the project.

- 2.5 **GE1** – Natural England would like to make the Examining Authority aware that discussions are ongoing with the Applicant regarding certain mitigation measures; therefore the table in the ES Volume 4 (Annex 4.5.5) may require updating in the future. Paragraphs 6.6.38 – 6.6.44 of Natural England’s Written Representations set out these outstanding issues.
- 2.6 **GE3** - Natural England would like to highlight there are ongoing discussions with the Applicant regarding the application of Section 28 of the Wildlife and Countryside Act 1981 (as amended). Please see paragraphs 6.6.32 – 6.6.33 of our Written Representations and Appendix I of this document for further information.
- 2.7 **EOO1** - Under the Summary of matters not agreed the Applicant states that in relation *“to the use of site specific flight height data and the use of the Extended Band Model (for kittiwake and gannet) for quantifying collision risk.... There has not been a change in position from either side in relation to these topics since these debates were last had”*.
- 2.8 Natural England note that while there has not been a change in our position regarding the use of the Hornsea Project site specific flight height data and the use of the Extended Band Model for gannet and kittiwake, since the close of examination for Hornsea Project One the Marine Scotland Science report on *“The avoidance rates of collision between birds and offshore turbines”* has been published (Cook et al. 2014). In response to this, the SNCBs published a position statement (JNCC et al. 2014) which sets out SNCB recommendations with regards to the use of the Extended Band model for a range of species, and which also covers some issues relating to the use of site specific flight height data in the different Band Model options.
- 2.9 **EOO2** - (f): This ExA question relates to the assumptions used to apportion birds to SPAs in different seasons, for kittiwakes, gannets and auks in relation to the Applicant’s ornithological assessment for the Hornsea Project 2 alone.
- 2.10 In the Applicant’s response to EOO2 – Extended response Appendix M to the Response submitted for Deadline I Application Reference: EN010053 it is stated that: *“In their Section 42 response, Natural England recommended the*

use of the apportioning approach applied for the Dogger Bank Creyke Beck project. It was agreed at a consultation meeting on the 18th August 2014 that this approach would be implemented for the Project. The Applicant therefore followed this approach for the designated breeding populations of gannet, kittiwake, guillemot, razorbill and puffin at Flamborough and Filey Coast pSPA.”

- 2.11 Natural England notes that the Applicant’s response under EOO2 (f) appears to refer to apportioning impacts from Hornsea Project 2 in the breeding season. That being the case Natural England did not recommend the use of the apportioning approach applied for the Dogger Bank Creyke Beck project in our Section 42 response or in subsequent consultation meetings, or agree that this approach should be followed for the designated breeding populations of gannet, kittiwake, guillemot, razorbill and puffin at Flamborough and Filey Coast pSPA (FFC pSPA).
- 2.12 For auk species, Natural England notes that advice given to Forewind as part of the Dogger Bank Creyke Beck application was in response to discussions regarding the likely origin of auks within the Dogger Bank Creyke Beck project area during the breeding season which is likely to be different from the situation at Hornsea Project 2. For example, for Dogger Bank Creyke Beck the use of a 200km foraging range for guillemot was used to reflect that breeding birds from both the Farne Islands SPA and FFC pSPA could be present in the Project area during the breeding season. This assumption would not necessarily hold for Hornsea Project 2, which lies much closer to FFC pSPA than it does to the Farne Islands SPA. Additionally the Forewind apportioning work did not cover puffin.
- 2.13 In relation to gannet apportioning to SPAs in the breeding season it has been agreed with the Applicant that as Hornsea Project 2 is within the mean-maximum foraging range of FFC pSPA and this is the only SPA within this range, 100% of birds would be apportioned to FFC pSPA during the breeding season. This differs from the approach taken at Dogger Bank Creyke Beck where the maximum foraging range was used and birds were apportioned to both FFC pSPA and also Forth Islands SPA based on tracking evidence specific to the Dogger Bank project areas.
- 2.14 For kittiwake, where the Applicant proposed a variety of apportioning approaches, it was agreed that for projects that were located between the mean-maximum and maximum foraging range of a relevant SPA (such as Hornsea Project 2 in relation to FFC pSPA), the Applicant would present a range of apportioning values up to and including 100% apportioning of birds to the SPA during the breeding season.

- 2.15 For the non-breeding season Natural England advised the Applicant that apportioning should be based on population scales and sizes in the published Furness (2015) BDMPS report which had not been published at the time of the Dogger Bank Creyke Beck examination.
- 2.16 **EOO4(a)** - Natural England welcomes the work done by the Applicant to address the uncertainty in the collision risk estimates and present a range of values that allows for interpretation of uncertainty in species density, generic flight height data and avoidance rates in the assessment of predicted impacts on species. However, Natural England is not aware that it agreed with the Applicant that mean values (or 'best estimates') are the "*appropriate metrics to inform the collision risk assessment for the Project*", or that this is stated anywhere in Table 4.1 of the SoCG between the Applicant and Natural England (Appendix ZZ of the Response). Natural England's view is that the confidence limits around collision estimates represent the range of collision risk values within which the real value lies (with a given probability), taking account of the uncertainty in some of the key input parameters in the modelling – namely the avoidance rates, species density data from baseline surveys and flight height variability. Natural England considers it important that the full range of uncertainty around the collision estimates is understood and can be considered when assessing the potential impacts that might arise from the operation of the project due to collision mortality.
- 2.17 **EOO4(b)(ii)** - Natural England does not agree with the Applicant's view that a precautionary 98% avoidance rate (AR) is appropriate to use for gannet and kittiwake with Extended Band Model Options 3 and 4. Cook et al. (2014) did not recommend an avoidance rate for kittiwake or gannet for use with Option 3 of the Extended Band model, due to a lack of species-specific data to support any recommendation as to an appropriate AR to use. The SNCB recommendation is, therefore, that it is not appropriate to use the Extended Band Model in predicting collision figures for gannet and kittiwake at this time (JNCC et al. 2014). Further, Natural England does not recommend the use of "Option 4" of the Extended Band Model. This is because there is no evidence to support what might be an appropriate avoidance rate with an "Option 4" model for any species, and also because of the unquantified uncertainty around one metre resolution flight height data derived from the site-specific surveys, and the unquantified sensitivity of the Extended Band Model to the assumed flight height distribution of birds at the site.
- 2.18 **EOO4(b)(iii)** - Natural England does not anticipate that the level of mortality for migratory species in this assessment will reach levels approaching significance. However, Natural England remains unclear of the methodology used for the migratory bird collision risk modelling analysis for Arctic skua, great skua, Arctic

tern, common tern and little gull, including information on the derivation and population numbers used in the analysis as well as the population scales (and sizes) and baseline mortality rates that have been used to assess predicted impacts against. Natural England has advised that the results of these analyses are an important element of the assessment of impacts for this, and other, projects and need to be presented in a clear and transparent way.

2.19 **EOO4(b)(iv)**- Natural England does not agree with the Applicant's statement that "*Natural England has previously emphasised PBR over PVA*" as a tool to assess the implications of mortality (e.g. arising from collision or displacement) for a population. In Natural England's Deadline V submission during the Hornsea Project One examination we stated that "*Natural England would like to clarify that PBR is not our preferred method of determining thresholds for assessing population impacts. Natural England has considered the use of a PBR modelling approach in cases where up to date, colony specific PVA models have not been available, as PBR offers a simpler modelling approach that requires the input of less population data in order to assess potential population impacts. If relevant PVA models exist for populations being considered then Natural England would consider the outputs of these models alongside any other evidence that exists to enable us to assess the predicted impacts on populations under consideration*".

2.20 Since the close of the Hornsea Project One examination the SNCB's have had further discussions regarding the use of PBR and PVA tools for assessing population impacts resulting from collision or displacement mortality predicted for offshore wind farms. Natural England currently advises that wherever possible the population level impacts of predicted mortality from developments should be assessed using PVA models as these allow the effects of factors such as density dependence and varying demographic parameters to be explicitly investigated in terms of their effect on the population trajectory. PVA models also allow relative comparisons of population level effects with and without the additional mortality to be considered in a way that is not possible with PBR.

2.21 **EOO5(b)** - The Applicant states that Herring gull has been screened out of the EIA assessment on the basis that numbers on the project site did not exceed 1% of the regional population. Natural England note that we have advised that for determining whether further assessment of population impacts is required the key criterion is whether predicted mortalities would exceed 1% of the baseline mortality assessed at the relevant population scale. For the non-breeding season this 1% of baseline mortality threshold for Herring gull would be around 775 birds at a North Sea BDMPS regional scale. Natural England also note that the non-breeding season for Herring gull is September to

February (following Furness 2015) and not August to April as stated by the Applicant.

- 2.22 However, while it is likely that the low survey coverage in December of both years will have affected estimates of the number of birds using the area during the non-breeding season, based on the numbers recorded during other non-breeding season months Natural England considers that it is unlikely that the non-breeding numbers of Herring gulls in the Project 2 area are such that that a regionally important population has been missed, and the screening out of herring gull in the EIA is considered appropriate.
- 2.23 **EOO8** - Natural England would like to highlight there are ongoing discussions with the Applicant regarding the cumulative and in-combination assessment impacts. With regards the Applicant's comments under EOO8 (f), Natural England agrees with the Applicant that the spatial scope of the assessment during the breeding season depends on the defined foraging ranges of each species. However, we do not agree with the Applicant's statement that foraging ranges have been agreed for all species. Natural England is in discussion with the Applicant regarding appropriate ranges to use and, therefore, which projects would be scoped into a cumulative or in-combination assessment for the breeding season months.
- 2.24 **EOMM10 (3)** – Natural England does not agree with this paragraph which states that “*it is likely marine mammals will tolerate this predicted increase in vessel disturbance.*” Natural England refers the Examining Authority to paragraphs 6.6.14 – 6.6.16 of our Written Representation, where we acknowledged that the physical disturbance of a boat is short lived however that we still have concerns around tipping points in terms of vessel disturbance and reduced harbour porpoise foraging. We accept that this concern is a wider issue than just the Hornsea Project 2 application and, therefore, recommend that a strategic overview is needed within the region and the wider North Sea area to consider cumulative effects of vessel disturbance.
- 2.25 **EOMM14 (6)** – In relation to the references to the preliminary results of the DEPONS work, Natural England would like to reiterate our response to question EOMM14 at Deadline I which stated that Natural England were told at a recent DEPONS meeting that the results were only to show that the model worked, using empirical data from a much smaller wind farm that had employed noise reduction technologies (bubble curtains). To Natural England's best knowledge, site specific variables from individual wind farms have not yet been introduced into the DEPONS model (e.g. hammer energies/pile diameters/predicted sound levels and attenuation), therefore the preliminary results should not be used to support recovery of porpoise.

- 2.26 **EL9 (a)** – Natural England advises that any in-combination (sequential and in-parallel) impacts with consented plans/projects, including if the project may be split (post consent) into more than one project, needs to be fully considered in the Secretary of State’s Appropriate Assessment (AA).
- 2.27 Natural England’s main in-combination concerns are in relation to impacts on intertidal Annex I features of the Humber Estuary SAC and Humber Estuary SSSI during construction, through:
- Accessing the site in parallel with other projects if access routes are unable to be shared which would increase the area of impacts; and/or
 - Sequential impacts that would increase the duration of the impacts and potentially affect the recovery of the site.
- 2.28 As the construction phase for each of the Hornsea projects is outside of the over-wintering period we do not believe that there is an in-combination/cumulative impact on the Humber Estuary SPA from construction works. However, please see previous comments in relation to impacts over the lifetime of the project (paragraph 2.4).
- 2.29 **EL11** – Natural England refers the Examining Authority to paragraphs 6.6.32 – 6.6.36 of its Written Representation, where we have raised concerns regarding the cumulative effects of Hornsea Project 2 over the lifetime of the project. Natural England has particular concerns regarding the implications of long-term access across and activities within the Humber Estuary SAC and Humber Estuary SPA and the associated disturbance to their interest features.
- 2.30 **DC20** – As highlighted in our WR (paragraph 6.6.42) the in principle monitoring plan (IPMP) should specify the objectives of different monitoring/survey requirements rather than detail how surveys will be undertaken. The IPMP simply provides the means to expand on the conditions in the Deemed Marine Licences. It provides a record of agreement regarding the rationale behind the monitoring being required, whilst providing the flexibility for amendments to be made should monitoring needs change based on new information. This is particularly useful should the project be sold on or the project team changes, or if significant time passes between consent and construction.
- 2.31 Natural England is currently working with the Applicant to resolve issues relating to the assessment on ornithological impacts. Depending on the output of these impact assessments, Natural England may advise that specific monitoring should be carried out. The IPMP would provide the space to agree the objectives of such monitoring, and explain how any monitoring will assist in either validating predictions in the Environmental Statement or addressing key uncertainties.

Other Written Representations

Environment Agency's response to First Written Questions Submitted for Deadline 1 (dated 15th July 2015)

- 2.48 **EL6** - Natural England would like to highlight it does not have a statutory role with regard to the Hedgerow Regulations and therefore does not have any comments to make. Local authorities are responsible for enforcing the Hedgerow Regulations.
- 2.49 **EL3** – Based on the information provided Natural England is content there will be no ecological impacts to Donna Nook National Nature Reserve (NNR) from the intertidal corridor and working area. As mentioned in our response to question EOMM25 at Deadline 1, construction works in the intertidal area will be limited to April and September as secured in Conditions 20(3) and 20(4) of deemed Marine Licences A2 and B2 contained within the projects draft DCO, this will avoid the main pupping season for grey seals (October – December).

Written Representation for the Royal Society for the Protection of Birds (RSPB) for Deadline 1 (dated 15th July 2015)

- 2.50 Natural England notes that the RSPB is concerned about the use of a 7.7 m tide at Grimsby to control operations over the intertidal zone, as set out in section 20(4) of the DMLs (as well as in Schedules I and K in the draft DCO). The provisions currently limit works “*within one kilometre seaward of the seawall during the period of time commencing two hours before a high tide greater than 7.7 metres (as measured at Grimsby) between 1 April and 31 May (inclusive) and 1 August to 30 September (inclusive)*”. There are concerns about tides that are greater than 6.5m when measured against Ordnance Datum at Tetney. Grimsby has a 1.2m sill, and if it is not included in the 7.7m measurement at Grimsby there will be few, if any, high tides at Tetney at which works associated with cable laying would stop.
- 2.51 Natural England agrees with the concerns raised by RSPB and recommends that the draft DCO is amended to include the same reference to tidal conditions as recently used for the Tetney Sea-Line Replacement Project. The Planning Consent and Marine Licence for this project contained conditions stating that ground works shall be suspended “*two hours either side of high tides predicted to exceed 6.5m CD [Chart Datum] at Grimsby*” (conditions 7 and 3.25 respectively). The purpose of these conditions is to reduce disturbance to birds when the area of exposed beach is at a minimum. This is Natural England's standard best practice approach for all

plans/projects in this area of coastline, to ensure that there is no Adverse Effect on Integrity (AEOI) on the Humber Estuary SPA and Ramsar site.

SECTION B – COMMENTS ON THE OFFSHORE ORNITHOLOGY CLARIFICATION NOTES SUBMITTED BY THE APPLICANT AT DEADLINE I

Comments on Offshore Ornithology Baseline Data Clarification Note. Appendix L to the Response submitted for Deadline I.

- 3.1 Natural England acknowledges this additional work by the Applicant to update the tables of baseline data on bird numbers and associated population estimates, so that the numbers used in the subsequent impact assessments (e.g. collision risk modelling and displacement assessments) are clear.
- 3.2 Natural England can confirm that the Applicant has provided all the data tables for raw data, associated population estimates and associated confidence limits at the scales used for the different analyses, as requested by Natural England in our Relevant Representations (at paragraphs 8 and 9).
- 3.3 Natural England notes that the Applicant has not provided a fully worked example to show how the raw counts of birds on the water have been analysed in Distance or the coefficients of variation for the monthly Distance estimates, as requested in our Relevant Representation (paragraph 7). However, Natural England acknowledges the Applicant's explanation that the discrepancy between the raw counts and derived population estimates highlighted by Natural England in paragraphs 3 to 5 of our Relevant Representations is due to the inclusion of "*out of transect*" data in the original ES raw data tables, which were subsequently excluded from the Distance analysis to generate population estimates for birds on the water.
- 3.4 Natural England remains unclear about the details of the analysis method for calculating population estimates of birds in flight from the snapshot counts as well as details of the Distance analysis including information about model selection and fit. However, given that the Applicant has now provided information on the population estimates and associated confidence limits for all relevant species at the scale used for both collision risk modelling and displacement assessment, Natural England consider that the effects of the variability and uncertainty in the data used in the impact assessment can now be evaluated.
- 3.5 Natural England queries several of the numbers presented in Table 1.11 of Appendix L, where there seems to be a mismatch in the data for some months and species compared to the original figures in the Ornithology Technical report. For example, the Ornithology Technical report Table 6.37 gives a population estimate of 504 razorbill in Subzone 2 and a 2 km buffer for January of year 1, but the Tables in Appendix L show that equivalent population estimate was just 16 birds (0 birds on the water from Table 1.11 and 16 birds in

flight from table 1.12). The population estimates for razorbill in January and February of year 1 and all of year 2 seem to be attributed to the incorrect months. Natural England has raised these queries with the Applicant and understands that an updated version of Appendix L with the correct figures will be submitted at Deadline II.

- 3.6 Natural England notes that in Tables 1.1, 1.3, 1.5, 1.7, 1.9, 1.11, 1.12, 1.13, 1.14 and 1.15 of Appendix L, counts and population estimates are entered for December of survey Year 1 as zero values when in reality there was no survey coverage in Subzone 2 and buffer at all in that month and therefore no birds recorded or population estimates generated. Natural England has requested that the Applicant does not present data for December of year 1 in this way as it is misleading to suggest that there were no birds in the Project area at this time.

Comments on Ornithological Survey Coverage Baseline Clarification Note. Appendix K to the Response submitted for Deadline I.

- 3.7 Appendix K addresses the concerns raised in Natural England's Relevant Representations (paragraphs 10-19) about the levels of survey coverage in December of survey year 1 and November and December of survey year 2, and the effect that this might have on a) the generation of representative population estimates for the Project area and b) the subsequent assessment of potential project impacts on relevant species.
- 3.8 Overall Natural England concludes that:
- Notwithstanding our comments below about the Applicant's comparison of eastern and western transects by the Applicant, Natural England consider that given that the non-breeding season does not represent the period of peak abundance for the key species at the project area, and given that any east-west gradients of density are predicted to be greater in the breeding season months, the November year 2 survey data can be used in the assessment.
 - The Applicant has clarified that for the collision risk modelling (CRM) where monthly density estimates are required, the December year 2 density data has been used for December year 1 as well. While we consider that the December year 2 estimates have limitations and there may be better methods for dealing with the missing data from December year 1, Natural England do not consider that these would have a material effect on the results compared to use of the December Year 2 density data. However, Natural England note that calculation of species densities for CRM using transect data from a wider area than just Subzone 2 would improve the sample size for December Year 2.

- For the displacement assessment whereby the mean of the peak seasonal counts across years is taken, the Applicant has not provided a method for dealing with the missing December Year 1 data and has not adequately demonstrated that the population estimates derived from the December Year 2 data are representative. Natural England consider that this remains an issue for the assessment of Razorbill impacts in the non-breeding season (because this only uses November and December data) but acknowledge that this period is not the most important season for razorbill in the development area. Accordingly, Natural England will base our assessment on the available peak mean data with a caveat about the uncertainty in the data.

- 3.9 In our Relevant Representations, Natural England has highlighted the lack of any baseline survey data for December Year 1 in Project 2 areas used in both the collision risk and displacement assessments, and the fact that population estimates derived for December Year 2 were based on data collected from only 10 transects (out of the approximately 24 transects that fall within Subzone 2 and a 2km buffer) all in the east of the Subzone. Camphuysen et al. (2004) recommend that 20 transects per sampling area are needed for Distance analysis, although this will depend on the number and distribution of individuals in the survey area and potentially higher numbers of transects might be required.
- 3.10 This survey coverage issue in December of year 2 is further compounded by the fact that the portion of the 10 eastern transects that actually falls within the Project 2 area is considerably shorter than the western transects due to the irregular shape of Subzone 2 and the way the transect lines have been arranged within the survey area. Due to the shape of Hornsea Project 2 approximately 75% of each transect line in the eastern part of the Subzone falls outside the Subzone 2 area, so that for the collision risk modelling only around 25% of the data from an individual transect line would have been used to calculate a population estimate for birds in flight.
- 3.11 In November of year 2, while coverage is better with data from 19 transects apparently overlapping Subzone 2, there is no coverage of the westernmost transect lines in the survey area. Natural England has previously noted (Relevant Representations paragraph 12) that the lack of coverage in the western most transects in November of year 2 could have an effect on the generation of population estimates for the area, particularly if there were systematic differences in species density across the site in an east-west gradient.
- 3.12 The Applicant states that it is typical for boat-based offshore windfarm survey programmes to be incomplete and that the Applicant is “*unaware of statutory*

guidance specifying a minimum level of survey coverage in the event of adverse weather conditions”.

- 3.13 The survey design for baseline surveys needs to account for spatial and temporal variation (e.g. seasonal variation in bird numbers at the site) at a project site so that surveys of the distribution and abundance of marine birds in offshore environments will normally consist of a series of repeated survey visits extending over two or more years for site characterisation surveys (e.g. Jackson & Whitfield 2011). The timing of survey visits needs to be carefully planned so that they are as temporally representative as possible and in particular should be representative of seasonal cycles for seabird populations (e.g. breeding, moulting, non-breeding and migration periods). Additionally because the distribution and abundance of marine birds can be highly variable year to year, particularly in offshore areas, assessment of baseline conditions should be based on a minimum of two years survey data and this has become the standard for offshore wind farm surveys (Jackson and Whitfield 2011).
- 3.14 Natural England notes that the Applicant’s Evidence Plan (PINS Doc Ref 12.6.1) states that the data to be used to characterise bird activity in the Project Two area would include monthly boat-based surveys conducted across Subzone 2 and the wider Hornsea Zone over a two year period, commencing in March 2011 and ending in February 2013 and that this was agreed by JNCC in 2010. Natural England also note that subsequent to the survey period ending the Applicant indicated that there had been incomplete coverage in some months due to poor weather conditions and shorter day lengths.
- 3.15 Natural England note that in cases where developers have been unable to undertake surveys in individual months within a survey period due to adverse weather conditions we have often requested that additional surveys are carried out during the same season (for example two surveys in one month with at least two weeks separation between surveys) to ensure that a full two years of survey data are collected.
- 3.16 In Appendix K, the Applicant suggests that Natural England considers 80% coverage as being a threshold indicative of a complete count (i.e. if survey coverage is below 80% it is incomplete). Natural England is not suggesting that 80% coverage is some kind of threshold that determines whether coverage is complete or incomplete as this is dependent on species distribution patterns, numbers, temporal variability, survey method and survey area. This figure was used to demonstrate the relative effect of the missing and incomplete coverage in November and December for the non-breeding season assessments for different species. There was no survey coverage of Subzone 2 in December of year 1, coverage in December of year 2 was only 30% and restricted to less than 10 transects in the eastern end of the Hornsea P2 area where only a low

proportion of the transect lines fall within the Subzone 2 boundary due to the shape of the subzone. Further in year 2, 25% of the November transect coverage is missing and this missing coverage is not randomly distributed across the Project area but represents the transects in the western part of the site which Natural England in its Relevant Representations considered to be a limitation to the survey data for November of year 2. For Distance sampling it is recommended that at least 20 transects are sampled and these should be evenly distributed across the area, and ideally run parallel to any density gradients to reduce variance between transects (e.g. Camphuysen et al. 2004).

- 3.17 At a meeting with the Applicant on 3 June 2015, Natural England suggested a number of approaches that the Applicant could take to determine whether the November and December Year 2 data were sufficient to produce representative population estimates for the assessment. The Applicant also provided their own scope of work for assessing survey coverage. Appendix K represents the Applicant's assessment of the adequacy of survey coverage, although does not include all of the elements outlined in the scope of works originally presented to Natural England.

Baseline data used to inform the assessment of displacement and collision impacts.

- 3.18 In sections 1.4 and 1.5 the Applicant asserts that survey coverage is sufficient to provide a representative population estimate for the various species based on a description of the survey coverage in the different months. However without an analysis of the variability of the counts in relation to sample size it is not possible to conclude whether the survey coverage is sufficient to provide a "representative abundance" estimate.
- 3.19 Natural England notes that for the collision risk modelling it is necessary to have a density estimate for each survey month. Since there was no density estimate for December of year 1 the Applicant has used the December year 2 density values for both survey years. However as outlined above there are potential inadequacies with the survey data for December of year 2 in particular as the calculation of bird densities for use with the CRM are based only on the restricted amount of data collected from transect coverage falling within Subzone 2.
- 3.20 Baseline survey data are typically collected for an area greater than the windfarm footprint area – i.e. including a buffer area. Therefore, depending on the distribution of birds across the survey area, a range of different density estimates could be derived dependent on whether buffer areas are included in the calculations of bird density. Decisions regarding whether to include buffer areas in the calculations of population density depend on balancing the need to have a representative sample size, for calculating bird densities in the area, against differences in the number and distribution of birds in the project area

compared to buffer areas. This could lead to different calculations of densities according to whether data from the buffer area was included. Where reducing the analysis area to the project footprint only results in very few birds recorded in the sample, but where there is no ecological reason why numbers in the buffer might differ, then calculating densities of birds for CRM using data from buffer areas could provide a more robust density estimate. This is particularly relevant for Hornsea Project 2 during December of year 2 where survey data that fall within the Subzone 2 boundaries is insufficient for generating robust population estimates. It is unclear why the Applicant did not explore the use of additional data from outside the Subzone 2 area for generating density estimates, in particular for December of year 2.

Comparison with other Projects in North Sea.

- 3.21 The Applicant has made a visual comparison of seasonal patterns in counts for several species at Dogger Bank Creyke Beck, Dogger Bank Teesside and Hornsea Project One. The Applicant asserts in section 1.6 of Appendix K that since densities of razorbill decline between the post-breeding and non-breeding season and this pattern is mirrored on other projects like Dogger Bank there is a “*very low risk that the density in December of Year 1 would be significantly higher than that assumed in the assessment*”. Natural England notes that the density of birds in December of year 1 was 0 for all species because there were not any counts within Subzone 2 during that month. It is therefore highly likely that the density in December of year 1 would be significantly higher than that assumed in the assessment.
- 3.22 Additionally the Applicant indicates that razorbill numbers were generally higher on the project site during year 1 compared to year 2 which emphasises the reason why multiple years of survey data are required to adequately reflect the between year variability in seabird numbers as well as the seasonal variation within years. Natural England also note that the population estimates for razorbill at Dogger Bank Teesside do not support the Applicant’s conclusion that numbers of razorbill at North Sea project sites show a pattern of declining numbers from the post-breeding to non-breeding period. Natural England therefore does not consider that the qualitative comparison with data from other Projects undertaken by the Applicant provides any validation that the Hornsea P2 December population estimates are representative or statistically robust.

Missing coverage of western transects in November of Year 2.

- 3.23 To test whether the missing western coverage in November of Year 2 is an issue for the generation of population estimates for the whole survey area, the Applicant has made a visual comparison of the densities of birds recorded in the five westernmost transects 15-19 that were not covered in November of year 2, with transects 20-40, further east to see if there is any evidence of

systematic differences in species densities between the east and western parts of the survey area. The Applicant concludes that for the winter months there are no differences in species densities for the relevant species between transects 15-19 and 20-40. Natural England note that this does not provide a statistically robust assessment of the effect of the survey coverage and Natural England had suggested at the meeting on 3 June 2015 that the Applicant could, for example, undertake a more detailed assessment by generating population estimates and confidence limits using transects 20-40 and comparing these to population estimates generated using all transects 15-40 for those winter months where complete coverage was achieved (this was suggested for species like puffin and guillemot where the non-breeding months were wider than for razorbill).

- 3.24 Natural England also note that the Applicant could undertake a similar assessment for transects 15-29 compared to transects 30-39 to investigate the effect of only having survey data from transects 30-39 in December of year 2 for the estimation of densities of birds in flight used for the collision risk models. This would need to consider the coefficients of variation generated as well as a comparison of the population counts generated from the survey data.

Comments on the Collision Risk Modelling; Addressing Uncertainty clarification Note. Appendix J to the Response submitted for Deadline I.

- 3.25 Appendix J is additional work by the Applicant to address concerns that Natural England raised in our Relevant Representations concerning the collision risk modelling approach taken by the Applicant, in particular the treatment of uncertainty around the input parameters in the collision risk modelling.
- 3.26 Natural England can confirm that the Applicant has provided the Basic Band model outputs requested for gannet, kittiwake, lesser black-backed gull and great black-backed gull and additionally for lesser black-backed gull and great black-backed gull the Extended Band model Option 3 outputs using the requested parameter ranges as well.
- 3.27 Natural England note that the additional outputs presented for gannet and kittiwake using Option 3 of the Extended Band Model do not represent an approach that the SNCBs support or recommend (JNCC et al. 2014) for these species.
- 3.28 In the methodology section (1.2.1) the Applicant refers to the use of the avoidance rates recommended in Cook et al. (2014). Natural England notes that these avoidance rates differ in some cases from those recommended by the SNCBs (JNCC et al. 2014) – see also Natural England’s response to ExA question E004 in our Deadline I submission – although Natural England

acknowledge that the Applicant has provided outputs covering the full range of SNCB recommended avoidance rates for each species.

- 3.29 Natural England remains unclear about the methodology used to produce population estimates from the snapshot data of birds in flight and in particular the rationale for weighting the GLM of densities of birds in flight by the number of snapshots in each transect. Given that Hornsea P2 is an irregular shape with transects in the eastern part of the zone being considerably shorter than those in the western part, weighting the GLM by the number of snapshots per transect (which means that transects with fewer snapshots make a smaller contribution to the mean density for the site) could introduce bias into the analysis if birds are distributed unevenly across the survey area. However, Natural England acknowledges that the Applicant has demonstrated that the population estimates generated using the GLM method are not significantly different from estimates that would have been generated using the standard methodology, and Natural England welcomes the incorporation of the variability around the birds in flight densities into the collision risk modelling process as this represents a key area of uncertainty in the assessment of collision impacts.

Flight height distribution data to inform Band Model options 2 and 3:

- 3.30 The Applicant states that they do not have confidence in the use of the upper and lower confidence limits around the flight height curves from the Johnston et al. (2014a & 2014b) data. The issue the Applicant raised was that the frequencies of birds in the upper and lower 95% CLs of the flight height curves presented in Johnston et al. (2014a & 2014b) do not sum to unity and need to be normalised so that they do for use in the collision risk models. Natural England have spoken to one of the authors of the paper, who did not consider that it would be appropriate to normalise the curves and confirmed that they did not consider there to be an issue with using the upper and lower CLs as presented in Johnston et al (2014a & 2014b) in the CRM. However, Natural England suggested that if the Applicant was concerned about the validity of using the upper and lower CL curves in this way, then a solution would be to run the CRM using the 200 flight height curves that were created by Johnston et al (2014a & 2014b) for the original bootstrapping analysis, and to derive the upper and lower 95% CLs for the collision estimates from the distribution of CRM estimates produced from these (since the frequencies of birds within each of the 200 bootstrapped curves sum to unity).
- 3.31 Natural England notes that several of the CRM outputs presented by the Applicant in the results section of Appendix J are not those requested or recommended by Natural England – notably the outputs based on Option 4, and the outputs based on Option 3 for kittiwake and gannet.

3.32 The Applicant has presented the CRM outputs with CLs separately for the variability in species density data, flight height variability and AR variability. Natural England welcomes the presentation of CRM outputs that reflect the uncertainty in these variables and it is useful to see the effect of variability in each of these parameters separately. It would also be desirable to combine the different elements of uncertainty to give the full range of possible values for collision mortality that encompasses all aspects of uncertainty in the input variables. However, Natural England will use the ranges of collision mortality presented by the Applicant in Appendix J of its assessment of collision risk impacts.

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SECTION C – WRITTEN SUBMISSIONS OF ORAL CASES

Draft DCO issue-specific hearing on 13th February 2014

Matter 1

Item 2.1 Ownership, undertaker and liability – including various options for project development.

- 4.1 On issue of the relationship between parties involved in the development of Hornsea Project 2, in particular between the joint applicants, Natural England raised concerns on the implications of separating the project out between two operators. Natural England notes that the assessments presented in the application documents are based on a single project but the Applicant is proposing to effectively split the project into two separate wind farm projects. Natural England highlighted that the ES describes the access to the intertidal for maintenance visits over the lifetime of the project being required for 2-3 weeks a year. Natural England questioned whether separating the project would infer each undertaker was therefore able to access the intertidal area for 2-3 weeks, resulting in maintenance visits extending beyond the levels assessed in the ES (this matter was further discussed under Item 2.4 and Item 2.10 – see below).

Item 2.4 Description of Works – alternative construction schedules, including multi-phase; min-max apportionment for Wind Turbine Generator (WTG) layout

- 4.2 Regarding discussions around the phasing of works between the Panel and the Applicant, in particular on the issue of ducting and phasing, Natural England highlighted it would be useful for the Applicant to review the East Anglia 1 offshore windfarm (EA1) application which had a similar experience. For that project ducting for more than one project (EA3 and EA4) was agreed as part of the consenting process for EA ONE and not, as proposed by the applicant, through post-consent agreement between project owners.
- 4.3 On the issue of the description of works and accessing the foreshore Natural England highlighted to the panel that this was an area of ongoing discussion with the Applicant.
- 4.4 Natural England noted that the granting of the DCO would mean the Applicant would have permission to undertake any activity included in the DCO (i.e. cable installation and associated activities such as site investigations works and operation and maintenance over the life time of the project). The

applicant would also be considered under the Wildlife and Countryside Act (WCA), a Section 28G body (i.e. a statutory undertaker), and therefore would have several conservation and biodiversity duties. Please see Appendix I of this submission.

- 4.5 Natural England highlighted that access across and activities within the Humber Estuary SAC and Humber Estuary SPA over the lifetime of the project is an outstanding issue about which limited information has been provided by the Applicant. Natural England's preference would be that everything the Applicant will have permission for (i.e. what is included in DCO) is assessed during the consenting process rather than at a later stage. Natural England stressed that open-ended consents, under the Wildlife and Countryside Act (as amended), cannot be provided – and therefore the broad, worst-case scenario presented in the ES to assess impacts to the protected features from cable installation works could not be used to inform consents relating to the life time of the project, especially as there was no agreed access route and associated impact assessment presented in the ES. Natural England has flagged these concerns with the Applicant and has advised putting in place a Management Agreement for the lifetime of the project to undertake operations and maintenance activities, and that this should be agreed with Natural England prior to construction and secured as a condition in the DCO.
- 4.6 Natural England notes that there is a limited amount of information presented in the ES regarding access and impacts over the lifetime of the project. Therefore at this stage Natural England does not agree with the assessment presented. Natural England also highlighted that the AA should include consideration of impacts arising over the lifetime of the project; there are risks associated with deferring the assessment and resolution of impacts to subsequent permissions in an AA, and so the SoS would have to be comfortable with the robustness of such an approach.
- 4.7 Please see Appendix I of this submission regarding Natural England's position on Offshore Windfarm Developers as S28G Bodies under the Wildlife and Countryside Act 1981 (as amended).

Matter 2

Item 2.9 Codes of Conduct and various Management Plans – including In Principle Monitoring Plan, relationship of monitoring plans

- 4.8 On the issue of the In Principle Monitoring Plan (IPMP) Natural England highlighted the importance of the document. Natural England emphasised that

the plan will outline the types of monitoring that will be required over the lifetime of the project and specify the objectives of any monitoring (not how the monitoring would be done); this is important as after a project gets consent it may be sold on or new project teams are put in place. Therefore it is important to understand the purpose of any monitoring conditions.

- 4.9 Natural England agrees with the MMO that the IPMP may sit well in Article 14 of the DCO as a certified plan but wouldn't be held as a condition.

Matter 3

Item 2.10 DCO/DMLs and Conditions – various issues including hedgerows, dredging, piling, unaccounted debris, intertidal vehicle movement, method statement for landfall aspects of cabling works

- 4.10 Natural England explained that our Written Representation highlighted particular issues we would like to see included as conditions within the DCO/DMLs. These included: (1) the IPMP; (2) a requirement to undertake scheduled maintenance works over the intertidal outside the over-wintering period (October to March inclusive) due to possible disturbance the Humber Estuary SPA features; (3) the inclusion of strategic bird monitoring as an approach to validate assumptions used in the ES; and (4) depending on on-going discussions with the Applicant regarding offshore ornithology, Natural England may advise the inclusion of a condition for colony-specific monitoring.
- 4.11 Natural England also highlighted that with regards to scheduled maintenance works it considered that these would have a likely significant effect on the Humber Estuary SPA, and therefore that this element of the project requires consideration in any AA.
- 4.12 In particular Natural England has concerns when considering the splitting of project between two undertakers; the Applicant would need to consider potential impacts (e.g. disturbance) over 2 to 3 weeks for two projects. Natural England also noted that for "one off" requirements where works were particularly needed over the intertidal during the winter period, this could be addressed through the assenting process. However, Natural England considers the condition establishing the winter period as a restricted period for maintenance work to be an important one. If no agreement can be reached on this then Natural England would need to be precautionary in our advice to the SoS, as we consider 2-3 weeks disturbance to passage and overwintering birds to be significant. This may result in greater restrictions being placed on the developer.

4.13 Additionally, the use of a vehicle to access the site to carry out scheduled maintenance works would also need to be assessed as Natural England has concerns in relation to impacts to Humber Estuary SAC habitats.