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THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE)
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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 3

Dated 24th September 2015

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INTRODUCTION

- 1.1 This submission follows the second Issue Specific Hearing (ISH) for the Hornsea Project Two, which took place in the Ashbourne Hotel, North Killingholme, Immingham, between 15th and 16th September 2015.
- 1.2 This report consists of 8 parts
 - a. Section A– Written submission of Natural England’s oral case given at the issue specific hearings on 15th and 16th September 2015
 - b. Appendix 1- An update on ducting in the intertidal area from Natural England
 - c. Appendix 2 (submitted separately) – HRA Kittiwake Collision Impacts on Flamborough and Filey Coast pSPA
 - d. Appendix 3 (submitted separately) – HRA Collision and Displacement Impacts for Gannet on Flamborough and Filey Coast pSPA
 - e. Appendix 4 (submitted separately) – HRA Guillemot Displacement Impacts on Flamborough and Filey Coast pSPA
 - f. Appendix 5 (submitted separately) – HRA Razorbill Displacement Impacts on Flamborough and Filey Coast pSPA
 - g. Appendix 6 (submitted separately) – HRA Puffin Displacement Impacts on Flamborough and Filey Coast pSPA
 - h. Appendix 7 (submitted separately) – Notes from the Natural England and Renewable UK Post Consent Monitoring Workshop

SECTION A – SUMMARY OF NATURAL ENGLAND’S CASE AT THE ISSUE SPECIFIC HEARING ON 15 AND 16 SEPTEMBER 2015

Day 1 Agenda

Tuesday 15th September 2015

3. CL: Construction Onshore and Intertidal

Agenda Item 3.4 – Intertidal Zone Issues

1.3 Natural England acknowledged that a work restriction on tides higher than 6.5m above Chart Datum (CD) is consistent with other projects in this area. This is currently captured on condition 20 (4) of the transmission asset DML’s. Natural England noted that earlier discussions had taken place with the Applicant during which it was acknowledged that stopping works at every 6.5m tide or higher may be too prohibitive to Hornsea Project Two. Natural England therefore advised the Applicant to ascertain how regular the disturbance to Humber Estuary Special Protection Area (SPA) birds would be and whether there are alternative roost areas available for birds during the Hornsea P2 works. The Applicant may be able to demonstrate that the restriction may not be necessary.

1.4 Regarding cable burial depth in the intertidal zone, Natural England confirmed, in line with its Written Representation (paragraphs 6.6.23 – 6.6.26), that it was satisfied with the assessment undertaken by the Applicant. Natural England also noted that there would be an onus on the Applicant to re-bury the cable should the unlikely event happen of the cable becoming exposed.

1.5 Natural England agreed with the RSPB that it would be useful to understand the timing of ducting works for Hornsea Project Two. Consideration should also be given to the installation of ducts for both Project One and Two at the same time as this may help to further reduce the environmental impacts, potentially enabling any conditions to be less restrictive. Natural England acknowledged that it would be useful if it supplied what was agreed for East Anglia 1 and 3 to all parties, where ducting was put in at the same time for both projects (see Appendix 1 for more details).

1.6 Natural England highlighted that it was expecting further information from the Applicant on an Intertidal Access Management Plan. Natural England noted that this plan is expected at Deadline 4 and would address outstanding issues regarding access to the intertidal area over the lifetime of the project.

Agenda Item 3.7 – Criteria for choosing port location for construction work and for Operation and Maintenance (O&M) base.

1.7 Natural England noted that it will be raising the Greater Wash draft SPA in proceedings on September 16th, and summarised that Natural England is considering the implications of Hornsea project 2 on the features of this site, in particular Red-throated Divers. Operational vessel movements are likely to require restrictions to avoid disturbance to rafting birds in the future.

4. CS: Construction Offshore

Agenda Item 4.2 – In-principle monitoring plan (IPMP)

1.8 Natural England agreed with the Marine Management Organisation (MMO) that the IPMP is useful, not just for examination, but to inform future project managers. Natural England's experience with past projects is that detail surrounding the rationale for monitoring conditions can be lost further down the line; therefore, the IPMP is invaluable for undertakers, regulators and advisers. Natural England also added that IPMPs have been included in other DCOs such as in the Dogger Bank Teeside DCO.

Day 2 Agenda

Wednesday 16th September 2015

8. EOO: Ecology Offshore Ornithology

Agenda Item 8.1 - ExA approach to examination of offshore ornithological impacts, recognition of uncertainty and the importance of sensitivity analysis in the assessments

1.9 Natural England confirmed that the Flamborough and Filey Coast potential SPA (FFC pSPA) is an extension to the Flamborough Head & Bempton Cliffs SPA (FHBC SPA) and that an HRA assessment will be required for both sites.

1.10 Natural England also confirmed that it believed all relevant designated sites and features have been sufficiently considered in the Applicant's assessment.

Agenda Item 8.2 - Introductory updates from the applicant, Natural England and RSPB, including position reached by applicant & Natural England on the Offshore Ornithology Road Map

1.11 The Applicant outlined that a number of documents have been submitted and at this stage the agreement with Natural England is that there is:

- a. No Adverse Effect on Integrity (AEOI) alone for gannet impacts from collision and displacement; no AEOI in-combination based on collision impacts.
- b. No AEOI alone, or in-combination, for guillemot or razorbill from displacement impacts.
- c. No AEOI alone or in combination for puffin from displacement impacts.
- d. The Applicant noted that Natural England cannot conclude no AEOI alone or in combination for kittiwake from collision impacts but the Applicant is updating the roadmap to take this further.

1.12 Natural England agreed with the summary provided by the Applicant (in paragraph 1.11), but noted that methods used to reach these conclusions may differ from those used by the Applicant and Natural England agreed to highlight these in its submission at Deadline 3 (see Appendices 2 to 6 of this submission). Natural England also noted that their position as presented by the Applicant in their submissions at Deadline 2a were the Applicant's representation of Natural England's position, and not that of Natural England themselves. Natural England's positions will be made clear via the Statement of Common Ground (SoCG) and their submissions at Deadline 3.

Agenda Item 8.3 – Concise statement from applicant on extent of agreement between parties on baseline data issues

1.13 Natural England acknowledged that it had raised issues about the baseline survey data and its subsequent use in the impact assessment. In further discussions with the Applicant, Natural England agreed that the baseline survey data could be used in the assessments as confidence limits and ranges had been provided that can be used to highlight the variability and uncertainty in the data, but noted that it still has reservations about the data, including flight height of birds and survey coverage. Natural England stressed that it is important the Examining Authority bear in mind the uncertainties, and recognise the full range of potential variability detailed in the impact assessment that comes about as a result of the uncertainty.

Agenda item 8.4 - Extent of agreement between parties on methodological issues, including aspects of;

Collision Risk Modelling (CRM)

1.14 Natural England highlighted it had concerns on the collection of raw data from boat based surveys in 5m bands and the subsequent processing of this data into 1m bands by the Applicant. Natural England stated that collecting baseline data using the COWRIE standard methodology (Camphuysen et al 2004) is generally done in broad bands (e.g. below, at and above rotor height) and Natural England do not consider that boat based surveyors undertaking visual observations can accurately apportion bird flight height into 5m bands in particular as observers are not just recording height, but other metrics such as species identity, numbers and behaviour.

1.15 Natural England also highlighted that the Applicant had post-processed the data twice to fit the data into 1m bands for use with “Option 4” of the Extended Band Model. Natural England highlighted it was concerned that doing so adds further uncertainty to the interpretation of data. Natural England advised that in the case of Hornsea Project Two it would be better to use the generic flight height data and Option 2 of the Basic Band Model. Natural England noted that it was not aware of the Applicant’s approach being applied to other boat based survey data.

1.16 On the issue of estimating flight height at sea, Natural England highlighted that a recent study, which involved surveyors using a hexacopter to attempt to record flight height using broad bands and at a higher resolution (i.e. 5m bands) found a systematic bias, with individuals typically underestimating the height of the drone (i.e. the hexacopter). Irrespective of post- processing of the data, the bias is inherent and observations related to rotor height are predicted to be more accurate. Natural England added it had selected the generic model due to its concerns regarding the Applicant’s site specific flight height data.

1.17 The Examining Authority (ExA) read out the position of the Applicant regarding the use of the upper and lower 95% confidence intervals of the generic flight height data from Johnston et al (2014) and asked for Natural England and the RSPB for their views; *'The Applicant has stated that it may not be appropriate to simply sum the bands that are presented in the Johnson et al supplementary material because this could lead to the proportion of birds that are at potential collision height being artificially increased or decreased by change of the total population of birds in flight within the wind farm and not by altering the proportions within the flight height distribution.'*

1.18 Natural England advised that this point (paragraph 1.17) relates to confidence intervals published around the generic flight height data, which gives a metre by metre distribution curve generated by a statistical model using data from a number of offshore windfarms projects from which you can determine mean flight height. The analysis generated upper and lower confidence limits for the metre by metre flight heights with associated curves, from which you can obtain a percentage of the number of birds flying at the upper & lower curve height. Statutory Nature Conservation Bodies (SNCB) guidance (JNCC et al 2014) suggests that the upper and lower confidence limits (95%) should be used for presenting collision risk estimates when using Option 2 or Option 3 of the Band Model (the versions that use the generic flight height data).

1.19 If you sum all bird frequencies in each metre height category in the upper confidence limits it comes to more than one and if you sum those in the lower confidence limits curve it comes to less than one, because the mean comes to one. For this reason, the Applicant didn't agree that it was appropriate to use confidence limits where the frequencies don't sum to one - which is a valid point to make - and suggested that they should be normalised. Natural England consulted the report authors who didn't agree that the confidence limits should be normalised to sum to one as this would violate the statistical assumptions about how this curve was generated and did not see an issue with using those numbers in the Band Model, even though it might violate some statistical assumptions.

1.20 Natural England suggested that a 'work around' is that since upper and lower confidence limits have been generated by 200 bootstrap samples and the frequencies of birds in each bootstrap sample sum to one, the Applicant could calculate collision outputs using each of the 200 bootstrap samples (bootstrapping is a widely recognised and well established method whereby you repeatedly sample a sample data set, with replacement, to create a large number - in this case 200 - of different samples of e.g. flight heights and can be used for non-normally distributed data to generate statistics e.g. mean, confidence limits without knowing what the

underlying distribution is)¹ and use the upper and lower 95% confidence intervals from these 200 CRM outputs. The bootstrap samples are available and using this technique would get around the statistical anomaly that the Applicant had flagged up in this case, however the Applicant did not wish to run the CRM 200 times.

1.21 The Applicant has presented CRM outputs for the Option 2 and 3 using the published upper and lower confidence limit data for the flight heights curves, and on the basis that the report authors consider it is appropriate to just use the published upper and lower confidence limits, Natural England have accepted the Applicant's figures.

Avoidance Rates

1.22 When asked by the ExA why SNCBs don't fully agree with recommendations of the Marine Science Scotland Report for kittiwake, Natural England highlighted that in general it largely does follow the recommendations in the Marine Science Scotland Report. However, the issue for kittiwake was that the Marine Science Scotland Report based their assessment of avoidance rate (AR) for kittiwake on a "small gull" collision rate. The "small gull" collisions rate in the Marine Science Scotland report is derived mostly from data on black-headed and common gull. Both of these species are more closely associated with coastal and terrestrial habitats compared to kittiwakes, which have a more pelagic distribution. In an offshore marine environment, such as that at the Hornsea Zone, the SNCBs consider that kittiwake would be less likely to show flight behaviour consistent with the "small gull" AR. Therefore Natural England advise using the generic "all gull" avoidance rate, which includes gull species that exhibit a more pelagic distribution.

Band Model choice

1.23 Natural England noted that the Applicant has provided Basic Band Model Option 1 and 2 outputs for gannet, kittiwake, lesser black-backed gull and great black-backed gull using the AR's that Natural England recommended, plus the standard deviations around those AR's. The Applicant also provided Option 3 Extended Band Model outputs for lesser and great black-backed gull using AR's recommended in the Marine Scotland Science report and endorsed by the SNCBs. Natural England noted that it was happy to have this data and that it has used this data for its assessment, although Natural England doesn't agree with the Applicant's position on the choice of Band Models to use in assessments.

1.24 Natural England also noted it was happy in the way that the estimates were calculated, with the caveat that there are some errors in the latest documents submitted at Deadline 2a, in particular where the Applicant has presented figures as

¹ Bootstrapping is a widely recognised statistical technique used, amongst other things, to generate confidence limits from a set of data: [https://en.wikipedia.org/wiki/Bootstrapping_\(statistics\)](https://en.wikipedia.org/wiki/Bootstrapping_(statistics)).

Natural England's position. Natural England stressed that the figures in the Applicant's papers were not correct and do not represent Natural England's position, and committed to clarify its position in its written submission at Deadline 3 (see Appendix 2-6 of this submission).

Calculation of displacement rates

1.25 On the issue of summing monthly mortality rates together to generate annual mortality, Natural England advised that in the context of a Habitats Regulation Assessment (HRA) where you are apportioning birds back to a colony e.g. FFC pSPA, there is a need to consider impacts that may occur on individuals from colonies throughout the annual cycle. Natural England considers that impacts from discrete seasons should be summed to obtain an annual impact on that colony. Natural England agreed with the RSPB that although in the breeding season the population is potentially a smaller population from a smaller spatial area, and then in the non-breeding season you are looking at a much wider area, the actual apportioning back to the SPA means that you apportion only those individuals within that population that come from that colony. Since impacts on the colony may occur throughout the year it is not biologically meaningful to look at one season when you are trying to consider an impact on the population, for example where you are putting that impact into a Population Viability Analysis (PVA) model. While there is potential to account for displacement on the same individual multiple times, Natural England consider this is reduced if biologically defined minimum population scales in discrete seasonal periods are used. Natural England added that this is more of an issue in EIA context and Natural England is in discussions with Applicant about the appropriate population scales and methods to use.

1.26 Natural England also noted that the SNCB position is that displacement impacts even for EIA should be considered across the whole annual cycle, and the way that the population scales are split into the different seasons is done in such a way so as to minimise the overlap between individuals. The likelihood of encountering the same individual from the breeding in the non-breeding season in the same Project area is minimal. Natural England believes that whilst there is the scope for potential double counting individuals for the EIA assessment, by defining discreet populations in each season you minimise the amount of overlap.

1.27 Natural England advised it was satisfied that the Applicant presented the whole range of displacement and mortality rates in the matrix approach, under guidance from SNCBs. Within this the Applicant has identified its preferred displacement and mortality rates for use in assessment. Natural England takes the view that referring to a smaller subset of the matrix is more realistic based upon the sensitivity of each species. Natural England advised it is looking at 30-70% displacement rates for guillemot and razorbill and 1-10% mortality for these species. The Applicant has come up with a specific point of preference that lies within the

ranges preferred by Natural England. Natural England highlighted it prefers to consider a range as opposed to a specific rate.

1.28 Natural England also advised that SNCB advice and guidance is that where you have collision and displacement impacts for gannet these should be treated in an additive way. The reason Natural England doesn't see this as precautionary is that gannet collision is based upon birds in flight in a given project area whilst displacement is for all birds in the area, such as birds in flight and on the water - so it's looking at different components of use of the site. An AR is factored into CRM and only the birds not avoiding the offshore windfarm are subject to potential collision. The AR considers both macro (wind farm scale) and micro (turbine scale) avoidance. Macro avoidance is a form of displacement by just looking at collision risk then if for example 70% of birds are actually avoiding the area altogether (as may be the case for species like gannet) these should be treated as displaced birds. By aligning displacement rates to AR you minimise any double counting.

Population Viability Analysis (PVA) and Potential Biological Removal (PBR)

1.29 Natural England highlighted it welcomed the PVA Report provided at Deadline 2a. Natural England had asked for density independent models that mirrored the population trends on site as closely as possible, although the Applicant had provided models where the growth rates were dependent only on demographic rates used in the model. Adding to models provided at Hornsea Project One Natural England asked for updated demographic parameters (e.g. survival rates) from a recent review by Horswill and Robinson (2015) and site specific productivity to be built into the model for FFC pSPA. The Applicant also produced a number of metrics for evaluating the PVA models; Natural England highlighted it was happy with the outputs of the models and would use these in its assessment of impacts.

1.30 With regards to density dependent and independent models, Natural England stated in short that its preference was the density independent model. Whilst there is some evidence of density dependence operating on seabird populations, the strength and form is quite variable. There is some evidence of density dependence operating on recruitment to the UK kittiwake population, but for other demographic parameters there is no evidence of density dependence. With productivity there is some evidence of compensation operating. Therefore, there isn't the evidence to select the level or form of density dependence that should be applied to a PVA model. Further the density dependent models presented by the Applicant have been tuned in an attempt to get the model to have a stable trajectory by modifying the scale of the density dependence operating on the reproductive rate rather than by changing the demographic variables. Natural England has reservations about this approach. Broadly speaking density independent outputs will be the most precautionary, except in the case of compensatory density dependence operating. The effect of assuming compensatory density dependence will be to ameliorate the

population effect of the predicted impact - but we have no idea as to the extent of this effect. On this basis Natural England considers that the outputs of a density independent model should form the basis of the assessment, with the acknowledgement that if density dependence is operating on the colony then the impacts may be less than that predicted from the density independent model.

1.31 The ExA cited the McArthur Green report noting '*populations subject to density regulation are effectively buffered against potentially negative effects which do not impinge on the limiting resource.*' The ExA summarised that there is a self-correcting mechanism in play.

1.32 With regards to the point above (paragraph 1.31), Natural England noted that this is clearly the effect of density dependence, but stressed that the question remains as to whether density dependence is actually operating on the populations in question. There is also the issue of whether these are closed populations. Natural England noted that the gannet population is increasing at a very high rate and there doesn't appear to be density dependence operating. The high growth rate may be as a result of immigration to the site. Natural England noted that the point in section 1.31 is correct theoretically, but the reality is it may not be the case at the scale of colonies and timeframes being considered.

1.33 Natural England agreed, along with the Applicant and RSPB, that PVA is the recommended method for the HRA.

Tiering/ relevant projects for cumulative and in-combination effects assessment

1.34 Natural England highlighted it had no objection to the two tier approach as it has no material impact on the assessment.

1.35 Natural England also noted that for Hornsea Project One there was a difference between taking a building block approach to include projects up to and including Hornsea Project One, as there were other offshore windfarm projects in the application process (e.g. Dogger Bank Creyke Beck, and Dogger Bank Teesside) which were after Hornsea Project 1 but where there was some ES data available. For Hornsea Project Two the only other project for which there is available data that hasn't been included in the Hornsea P2 assessment is East Anglia 3, and this data was not available at the time that Hornsea P2 undertook its assessment. If you were minded to you could apply an all projects approach and include the East Anglia 3 data.

1.36 Natural England highlighted it was broadly content with the list of projects and species that have been included by the Applicant. The projects are different for different species as you are looking at different population scales. Natural England noted there are areas of discrepancy with the Applicant, and in these cases Natural

England have used their own figures. For example, the Applicant has reduced collision risk figures for Moray Firth and East Anglia 1 on the basis that the consented maximum number of turbines was less than that originally assessed. Natural England noted it was not clear why CRM figures had been reduced by a set percentage when the actual generating capacity, in terms of Mega Watts (MW), was not in direct proportion to the reduction in number of turbines. Natural England highlighted that if the projects were consented for fewer turbines but of bigger individual generating capacity (e.g. 5MW instead of 3.6MW) theoretically you should rerun the CRM, as turbines parameters will have changed. Natural England advised it had used the figures provided by the Applicant, but in some instances made a few adjustments to come up with its own cumulative and in combination assessments.

1.37 Natural England also highlighted that there are also discrepancies in the in-combination assessment where the Applicant has opted to use a different Band model for other consented projects. For example with East Anglia One Natural England highlighted it used Option 1 outputs for collision risk for gannet, whilst the Applicant has switched to Option 2. To Natural England's knowledge East Anglia One wasn't consented using Option 2 output, so Natural England referred back to the original outputs in the HRA for East Anglia One.

Agenda Item 8.5 - Update on assessment of collision and displacement impacts, as appropriate of Hornsea P2 alone, and in combination, for all relevant species for the Flamborough Head and Filey Coast pSPA (FFC SPA) in particular what are the views of Natural England and the RSPB on the updated assessments submitted by the Applicant for Deadline 2a, for the following species; a.) gannet, b.) kittiwake c.) guillemot d.) razorbill e.) puffin

1.38 Natural England advised it was in broad agreement with the Applicant's conclusions regarding the significance of collision and displacement impacts for the HRA species for Flamborough and Filey Coast pSPA, except for the kittiwake assessment.

Gannet

1.39 Natural England advised that for gannet it is broadly happy with the Applicant's apportioning approach for FFC pSPA during the breeding and non-breeding season. However, it does not agree with the use of the Extended Band Model for assessing collision risk and has based its collision risk impact assessment on the Basic Band Model, Option 2. Natural England stated it believes the gannet impact to be approximately 17 adults per annum alone and could vary between 6-37 based upon variability in baseline site densities. Natural England advised it calculated an additional mortality of 10 birds from displacement. In combination Natural England's position is 190 adults/yr, noting that there is no in combination displacement element to this assessment.

Kittiwake

1.40 Natural England highlighted it was broadly happy with the Applicant's approach to apportioning of kittiwake to the colony in the non-breeding season; however there is an area of disagreement with the apportioning in the breeding season. Natural England stated it does not agree with the Applicant's approach to apportioning breeding season impacts back to FFC pSPA. Natural England understands that the Applicant has calculated the percentage of birds to apportion back to the breeding colony based on figures generated from the Furness (2015) report which is an assessment of the distribution, abundance and origins of birds in UK waters in the winter. Natural England highlighted that it disagrees with using the non-breeding season data to come up with breeding season apportioning for the site, and noted that there are additionally some errors in the calculations.

1.41 Natural England noted the Applicant's approach makes an assumption that the numbers, distribution and origin of immature birds in UK North Sea waters in the breeding season mirror that of the non-breeding season, which Natural England does not agree is a valid assumption to make. Further, because the Applicant has additionally assumed that adult birds present in the project area in the breeding season could originate from a much smaller area defined by a foraging range of 156km from colonies, the Applicant has attempted to combine numbers from two different spatial scales to apportion birds to FFC pSPA. Natural England considers that this approach presents some mathematical issues regarding the way that data on the distribution of birds across two different spatial scales has been combined to work out the percentage of Hornsea Project 2 birds that are predicted to originate from FFC pSPA.

1.42 Natural England stressed that although the Hornsea project 2 area is beyond the mean maximum foraging range as published in Thaxter et al (2012), there is site specific data available that should be used. Natural England noted that there is considerable evidence that birds within the project area show connectivity with the Flamborough colony, particularly in the breeding season; this is backed up with evidence from tracking studies. The number of kittiwake in the area is high, with peaks in the breeding season. The Flamborough colony is the only large colony near the project area, therefore there is a much higher probability of encountering a Flamborough bird in the area in the breeding season than birds associated with other, more distant colonies. Therefore, Natural England advised that the Applicant should apportion all birds to the Flamborough colony, which was also the approach agreed at Hornsea Project One.

1.43 Natural England also highlighted it asked the Applicant to look at other parameters, such as proportion of adults recorded in baseline survey. This information was in the original Environmental Statement (ES) and Natural England have subsequently advised looking at the proportion of adult birds in the project

area, as there is a high probability of these being Flamborough birds. The Applicant has indicated that 94% of birds recorded on baseline surveys during the breeding season were classified as adult birds and Natural England noted that it has based its assessment for kittiwake upon 94% apportioning to Flamborough in the breeding season.

1.44 Natural England's view is that the project alone impact figure for Flamborough is 134 adult kittiwake collisions/yr, noting a range of 73-231 birds based on the variability in the baseline survey densities of birds. The in-combination value is 503 adult kittiwake collisions/yr; it was highlighted that there is no range for this figure as Natural England does not have the additional data on confidence limits for all projects in the in-combination assessment.

1.45 Regarding the kittiwake figures, Natural England added that this has been discussed considerably with the Applicant and it is recognised as a significant area of disagreement. Natural England highlighted it will continue discussions with the Applicant to refine the assessment if possible.

Guillemot

1.46 Natural England highlighted that it agrees broadly with the non-breeding guillemot apportioning, although noted that there has been a lot of discussion around the breeding season apportioning. Natural England view is that 46.3% of birds should be apportioned to Flamborough based upon the proportion of adults in the project area at this time, and has based its assessment on this figure, but that the Applicant has only apportioned 12% of birds to Flamborough in the breeding season. Natural England stated it has queried how this figure was calculated, for the same reasons as highlighted in the kittiwake calculation above. Natural England also advised that considering its preferred range of numbers in the displacement matrix (30-70-% displacement 1-10% mortality), the range of potential displacement impact values is 12-291 guillemot for the project alone and in combination figures are between 61-1,416 birds. Interpretation of the significance of the predicted impact requires narrative around this range which will be provided in more detail in our Deadline 3 submission.

Razorbill and Puffin

1.47 Natural England advised that its position for razorbill is the same as guillemot. Natural England agrees with the non-breeding apportioning, but not with breeding apportioning. Natural England also highlighted that it disagrees that not summing across seasons to get an annual figure is appropriate. Natural England outlined razorbill figures as 4-100 birds/yr alone and 16-364 birds/yr in combination, again these are presented as ranges and a narrative applies to each species. For puffin Natural England's stated its assumptions are 0-13 birds/yr alone, 1-54 birds/yr in-combination.

Agenda Item 8.6 - Extent of agreement between Natural England and the Applicant on any adverse integrity effects for relevant species for the FFC SPA for the project alone and in combination with other projects

1.48 Natural England noted the ExA request for the AEOI in a tabular form from Natural England and agreed to provide this at Deadline 3 (see Appendices 2 to 6 of this submission).

Agenda Item 8.7 - Extent of agreement between Natural England and the applicant on the likely significant effects (LSE) of project alone and cumulatively for relevant EIA species populations in the North Sea

1.49 Natural England highlighted that it prefers PVA over PBR wherever possible. In the case of EIA species, Natural England acknowledged there are not any PVA models available at an appropriate population scale, except for gannet where there is a UK colony PVA, which has been discussed with the Applicant. On the basis of no PVA models at the appropriate scale for assessment, Natural England acknowledged it would consider PBR outputs. Natural England also highlighted it has not received any updated information on the EIA assessment from the Applicant yet and that we have been focussing on resolving the issues related to HRA.

Agenda Item 8.8 - Mitigation measures, monitoring for the full life cycle of the project, and the adequacy of DCO requirement and DML conditions.

1.50 Natural England stated it was unaware of any built-in mitigation to the project other than the design envelope.

1.51 Natural England also agreed with the Applicant that changes to distribution of turbines within the footprint layout wouldn't link through to the assessment of impacts, as it is based on a density of birds in the footprint. The only change would be if the footprint of the project were reduced.

1.52 Natural England highlighted it recognises the benefit of strategic monitoring, as well as the challenges in securing it. Natural England has seen a good example presented by DONG and RSE who agreed voluntarily to fund tagging studies to get bird data on interactions with offshore windfarms.

1.53 Natural England stated it does not have particular views about how any monitoring is carried out at this stage as things can evolve in the future.

1.54 On the issue of whether ornithological monitoring is well secured in the DCO for Hornsea Project Two, Natural England stated that it is content with the monitoring conditions within the DCO. It also advised that in a general sense the requirements capture the need for monitoring in the IPMP. Natural England further noted that the IPMP is extraordinarily useful for capturing finer details on monitoring and this is updateable for the lifecycle of the project.

1.55 Natural England also added that, along with Renewable UK, it hosted a strategic monitoring workshop which was attended by developers, academics, regulators, consultants and representatives from overseas, where useful discussions on strategic monitoring were held. Natural England agreed to provide the notes from the workshop at Deadline 3 (see Appendix 7 of this submission).

9. EL: Ecology onshore and intertidal

Agenda Item 9.3 - Extent of agreement between Natural England and the applicant on any adverse integrity effects for relevant a.) ornithological species and b.) habitat for the Humber Estuaries SPA, Ramsar and SAC sites, for the project alone and in combination with other projects

Ornithological Species

1.56 Natural England advised that as set out in our Written Repts and SoCG that there was agreement about the interest features that may be impacted by the intertidal works.

1.57 Natural England highlighted that there is ongoing discussion regarding habitats not the species themselves; it is how they may be impacted directly or through disturbance. This is under discussion with the hope of resolving by Deadline 4.

1.58 Regarding the Greater Wash draft SPA (dSPA) Natural England advised that in terms of potential species likely to be of concern is it just red-throated diver. In terms of impacts the worst case scenario assumes the presence of rafting red-throated diver. If the site is classified there could be a potential for all offshore windfarms to have a standard condition to avoid rafting birds when transiting from their operational port through the boundary of the dSPA. It would be anticipated that there would be a post consent condition amendment to the marine licence to avoid rafting birds. As there is no guarantee, at this time, that the Greater Wash dSPA will be put forward to Europe as a classified SPA, Natural England believes it is not appropriate to apply this condition to the DCO now.

1.59 Natural England advised that baseline population numbers for the Greater Wash dSPA were included in the informal dialogue information. Natural England noted that conservation objectives have not yet been agreed since the site is in the informal dialogue stage.

1.60 Natural England would welcome a further screening exercise and a shadow HRA which would 'future-proof' the project.

Agenda Item 9.4 - Approaches to minimising onshore and intertidal ecological impacts of Hornsea P2, cumulative with Hornsea P1.

1.61 Regarding Plot 33 and its relation to the SSSI boundary, Natural England clarified to the ExA that Plot 33 is within the boundary of the SSSI.

Agenda Item 9.5 - Nature of impacts of the project on other designated sites (including SSSIs, NNRs and LNRs)

1.62 Natural England stressed it does not have any concerns in terms of impacts on any NNR, but in terms of SSSI there is still the ongoing issue highlighted in yesterday's hearing under Agenda item 3.4 (see paragraphs 1.3 – 1.6 above) and reiterated under Agenda Item 9.3 (see paragraph 1.57).

10. EOMM: Ecology offshore marine mammals

Agenda Item 10.2 - Possible designation of an SAC for harbour porpoise with potential overlap of the application site; update on likely consultation and implications for habitat Regulations Assessments (HRA)

1.63 Natural England advised that JNCC and other SNCBs have submitted formal advice to UK government in June in relation to dSACs for harbour porpoise. This is now being considered by the relevant administrations before approval is given to JNCC to begin formal consultation, with support from Natural England. Natural England anticipates that a formal consultation would start during autumn 2015. Therefore, Natural England advised that formal consultation may start during the examination but there is no specific timing.

1.64 Natural England advised that upon commencement of public consultation the dSAC would become of material consideration as a matter of government policy and therefore an assessment of impacts would need to be carried out.

1.65 Natural England confirmed that the information from the Applicant's assessment would be robust enough to carry out a HRA.

Agenda Item 10.3 - Adequacy of baseline population information for marine mammals

1.66 Natural England deferred to the Applicant for further details on the boat based surveys, but believed that for the Hornsea zone surveys, there was at least two observers all of the time. Observers were trained for both seabird and mammal observation, with one observer surveying the track line of the vessel, capturing both marine mammals and birds. In addition, a third, dedicated marine mammal observer

(MMO) was also present for sea states 0-3 for the majority of the time. Thinking has moved on and today Natural England would propose that a stand-alone MMO survey would be more appropriate. However, despite this, a standalone MMO survey would be unlikely to change the conclusions of the Applicant's Environmental Statement, because the Applicant's survey found slightly higher numbers of porpoise compared to the 2005 Scans II survey, showing the importance of the Hornsea zone for porpoise.

1.67 In terms of impacts relating to ducted propellers, Natural England advised that thinking and scientific knowledge has moved on and the corkscrew injuries previously thought to be most likely caused by ducted propellers have now been attributed to male grey seals - and therefore the risk from ducted propellers is less than once thought. Careful use of ducted propellers in sensitive areas is still secured as best practice in the MMMP.

Agenda Item 10.4 - Effects of displacement/ underwater noise

1.68 Natural England updated all parties that the updated DEPONS modelling report should become available in January 2016.

1.69 Natural England also provided an update about the potential consequences of disturbance modelling and the interim PCOD report. Natural England advised that there is nothing further to share at this stage. Natural England and JNCC are pushing forward with the interim report approach to see if it could answer questions around consequences for disturbance for examinations. Unfortunately the first stage was time and resource limited and it highlighted a few important questions that need answering before it could be used to inform of the examination process. Natural England highlighted that it is unlikely to be completed before January/ February 2016.

Agenda Item 10.5 - Cumulative impact: Natural England concern about impacts from vessel disturbance

1.70 Natural England agreed with the Applicant that nothing further needs to be done in terms of the Hornsea Project Two assessment, regarding vessel disturbance. Natural England acknowledged that an increase of 43% in vessel traffic seems like a lot but there is already a high level of boat traffic in the area. However, there is a concern about the cumulative effects of multiple windfarms in the North Sea and if there is a tipping point; there are questions surrounding what is the tipping point level is and how would it be monitored given all the different operations in the southern North Sea. Natural England noted that within its written representation, Natural England did suggest that the developers look to address this issue in a strategic way. In terms of monitoring in general Natural England has moved away

from site specific monitoring, it is a wide ranging question that needs answering by a regional group.

1.71 Natural England highlighted that cumulative assessments is something developers and SNCBs struggle with and there are no approaches agreed at the EU/OSPAR level. Natural England appreciates the Wildlife Trust's concerns of a dilution effect of cumulatively assessing an area and not taking account of all projects in the management unit, which is what the Applicant is assessing the harbour porpoise population upon. Natural England is not sure it is practical to assess every development because this would take account of every project in European North Sea waters. In terms of connectivity Natural England would agree more with the Applicant and the wider regional area would be the area of impact.

Agenda Item 10.6 - Entanglement with anchored monopoles

1.72 Natural England confirmed that taught steel moorings would be less of a risk than other types (e.g. catenary moorings).

Agenda Item 10.7 – Mitigation and monitoring

1.73 Natural England advised that Acoustic Deterrent Devices (ADD) have previously been employed as part of a suite of mitigation techniques.

1.74 Natural England noted that it was content the flexibility of the condition in the MMMP on the 'consideration of noise reduction at source technologies'. At the time of construction Natural England would like to see the use of the best available techniques, which will depend on advancements in technology. Natural England, therefore, prefers to leave the detail to nearer the construction time when construction methods are known and the best available technologies can be used.

Agenda Item 10.8 – Control of hammer energy piling

1.75 Natural England stressed that it wanted a condition on hammer energy piling in the MMMP or DMLs, purely to get security that if hammer energy is higher than 3,000kj then extra modelling will be required to evidence that this doesn't go outside of the assessed effect in the ES. The applicant agreed that the MMMP would reflect this.

Agenda Item 10.10 – Effects on the Humber Grey Seal Population

Natural England noted that there is an overwintering bird restriction that runs on the site from October to March secured in condition 20 (3) of the draft DMLs which covers most of the grey seal breeding season, and noted that there is an active bombing range in close proximity to the area.

APPENDIX 1 – AN UPDATE ON DUCTING IN THE INTERTIDAL AREA FROM NATURAL ENGLAND

1.76 Following the issue specific hearing Natural England consulted with Scottish Power Renewables (SPR) with regards to installing ducting for more than one project at the same time, considering the situation for East Anglia 1 and 3. It was noted during discussions with SPR that whilst installing the ducts for more than one project has benefits for the environment, land owners and developers (in relation to the future projects), this does need to be carefully thought through in advance. For East Anglia 1 there is a significant undertaking for it to install more than one project in relation to initial costs and also time spent on the ground (e.g. more traffic moving around and larger area of impact), which needs to be considered by any decision maker.

1.77 For East Anglia 1 installing ducting for more than one project was possible because East Anglia 1 assessed the installation of the ducts and terrestrial cables for more than one project in its Environmental Statement and the red line boundary (Order Limit) to allow space for the other projects. Therefore the DCO has a requirement for East Anglia 1 to install the ducts for future projects, not specifying which project(s). If for whatever reason East Anglia 1 no longer wanted to install further ducts then they would have to demonstrate to the Secretary of State that the other projects are not going to be built or are so far in the future it is not economically viable.

1.78 In conclusion it is therefore considered too difficult, given the stages of each of the Hornsea projects, to retrospectively fit the requirements of Hornsea Project Two into that of Hornsea Project One. It would require a material change to the Hornsea Project 1 DCO and Compulsory Purchased Right (CPO) Rights; therefore Natural England recognises in this instance that for legal reasons this is not a viable option.