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Hornsea 4 Project Team
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(By email only)

Planning Inspectorate Reference: EN010098
MMO Reference: DCO/2018/00014
Identification Number: 20029896

8 March 2022

Dear Jo Dowling,

Planning Act 2008 - Application by Ørsted Hornsea Project Four (UK) Limited ("Ltd") for an Order Granting Development Consent for Hornsea Project Four Offshore Wind Farm

Deadline 1 Submission

On 4 November 2021, the Marine Management Organisation (the "MMO") received notice under Section 56 of the Planning Act 2008 (the "PA 2008") that the Planning Inspectorate ("PINS") had accepted an application made by Orsted Hornsea Project Four (UK) Ltd (the "Applicant") for a development consent order (the "Application").

The Application seeks authorisation to construct, operate and maintain Hornsea Project Four offshore wind farm, comprising of up to 180 offshore wind turbines together with associated offshore and onshore infrastructure and all associated development (the "Project").

This document comprises the MMO's comments submitted in response to Deadline 1. The MMO submits/ comments on the following:

1. **Written Representation for Deadline 1**
2. **Notification of wish to speak at any of the Issue Specific Hearings (ISHs)**
3. **Notification by Statutory Parties of their wish to be considered as an Interested Party (IP) by the ExA**
4. **Notification of wish to have future correspondence received electronically**
5. **Comments on Relevant Representations (RRs)**
6. **Initial Statements of Common Ground (SoCGs) requested by the ExA (see Annex E)**
7. **Comments on Applicant's revised documents**

This written representation is submitted without prejudice to any future representation the MMO may make about the Application throughout the examination process. This representation is also submitted without prejudice to any decision the MMO may make on

any associated application for consent, permission, approval or any other type of authorisation submitted to the MMO either for the works in the marine area or for any other authorisation relevant to the proposed development.

Yours Sincerely

[redacted]

Gregg Smith
Marine Licencing Case Officer

[redacted]

1. Written Representation for Deadline 1
Summary of MMO's Relevant representation

1.1 On 16 December 2021 the MMO submitted the relevant representation response RR-020 to the Planning Inspectorate. The response outlined a number of major comments on the draft development consent order (the "dDCO"), deemed marine licence (the "DML") and Environmental Statement ("ES").

1.2 Other than the documents outlined within Section 6 "Comments on Applicant's revised documents" of this submission, the MMO have yet to receive responses from the Applicant regarding the issues raised, and as such our comments within RR-020, and the conclusion that the MMO is not currently satisfied, remains.

1.3 Regarding without prejudice compensation measures, such as offshore nesting platforms, the MMO request that these are included as an official schedule into the dDCO. For example, the use of an offshore artificial nesting platform to increase the annual recruitment of black-legged kittiwake and northern gannet (APP-057 Environmental Statement Volume A4 Annex 6.1 Compensation Project Description).

2. Notification of wish to speak at any of the Issue Specific Hearings (ISHs)

2.1 The MMO may wish to make oral representations at the ISHs that discuss topics within our remit, namely:

- ISH3 on offshore environmental matters
- ISH4 on the marine environment (excluding ornithology)
- ISH5 on marine and coastal ornithology
- ISH6 on the Habitats Regulations Assessment (should topics fall within our remit)
- ISH7 on environmental matters (should topics fall within our remit)
- ISH8 on environmental matters (should topics fall within our remit)

2.2 We note that the ExA will notify all Interested Parties of the detailed agenda for ISHs closer to the dates, and as such MMO will notify the ExA at this stage whether we wish to make oral representations.

3. Notification by Statutory Parties of their wish to be considered as an Interested Party (IP) by the ExA

The MMO wishes to be considered as an Interested Party by the ExA.

4. Notification of wish to have future correspondence received electronically

The MMO wishes to receive all future correspondence electronically. Please can all correspondence be sent to the following:

- Paul Stephenson, Marine Licensing Senior Case Manager – [redacted]

- Luella Williamson, Marine Licensing Case Manager – [redacted]
- Gregg Smith, Marine Licensing Case Officer – [redacted]
- MMO Case email address – [redacted]

5. Comments on Relevant Representations (RRs)

The MMO has reviewed the RRs and notes the comments made. The MMO will continue to maintain a watching brief on future submissions and will provide comment in future where necessary.

6. Initial Statements of Common Ground (SoCGs) requested by the ExA (see Annex E)

The Applicant is currently in the process of organising meetings with ourselves regarding the Statement of Common Ground. The MMO will continue to work with the Applicant on this and would support the deferral of the submission to Deadline 2.

7. Comments on Applicant's revised documents- G1.8 Hornsea Four Clarification Note on Peak Herring Spawning Period and Seasonal Piling Restriction (07554523_A)

7.1 To mitigate impacts from underwater noise (percussive piling) to herring, specifically within the Banks herring spawning ground, the Applicant has made a commitment (Commitment 190 in Volume A4, Annex 5.2: Commitments Register) to avoid percussive piling at the HVAC Booster Station within the export cable corridor route (ECC) during the 'peak' spawning season for herring at the Banks spawning ground, specifically between 1st September and 16th October each year. This commitment is secured by the dDCO Schedule 12, Part 2 - Condition 23.

7.2 During the pre-application consultation, the MMO expressed concerns regarding the Applicant's proposal of a seasonal piling restriction based on their estimated 'peak' timing of the herring spawning season. This was due to a lack of supporting data which could be used to determine what the 'peak' weeks/months of herring spawning are for the Hornsea 4 area. On this basis, we recommended piling restrictions for all piling within the ECC, array area and the HVAC booster station for the entire duration of the Banks herring spawning season as well as restrictions on construction activities along the ECC. The seasonal piling restriction for the HVAC booster station takes into account the whole Banks herring spawning season as follows:
Piling restriction- DCO Schedule 12, Part 2 - Condition 23. *"In the event that driven or part driven pile foundations are to be used to install Work No.3, no impact piling may be undertaken between 1st August and 31st October each year within the area of Work No. 3* as shown on the offshore works plans unless otherwise agreed in writing by the MMO after consultation with the relevant statutory nature conservation body."*

7.3 The Applicant has now provided further evidence to support the appropriateness of a "peak" spawning season as requested by both the MMO (RR-020 Paragraphs 3.7.25-3.7.36) and Natural England (RR-029 Paragraph 5.65 and appendix G). This is within the document titled "G1.8 Hornsea Four Clarification Note on Peak Herring Spawning Period and Seasonal Piling Restriction (07554523_A)" (hereby referred to as "G1.8 Clarification Note").

7.4 The MMO have reviewed the information within this document and consulted with our scientific advisors at the Centre for Environment, Fisheries and aquaculture Science (CEFAS). The MMO wish to make the following comments regarding this evidence:

7.5 To determine the commencement of the 'peak' spawning period for herring in the Banks grounds, the Applicant has interrogated International Herring Larval Survey (IHLS) data and performed a back-calculation to identify the most likely date for when herring spawning commenced for the majority of the larvae captured within the IHLS data.

7.6 The parameters used in the back-calculation for spawning timings are shown below (i-vi) and the MMO have provided comments on the Applicant's use and interpretation of the data under each of these headings:

7.7 IHLS survey timings
7.8 Larval length in survey sample data
7.9 Larval length at hatching
7.10 Egg development duration
7.11 Yolk absorption duration
7.12 Growth rate
7.13 Back Calculation

7.7 IHLS Survey timings

7.7.1 IHLS data for the Banks stock from 2007-2020 has been interrogated to account for inter-annual variations in larval abundances.

7.7.2 In Table 1, the MMO notes that no start date is provided for the IHLS surveys of 2017, the MMO presumes that this is because there was no IHLS survey conducted in 2017. The MMO requests that the G1.8 Clarification Note should be updated to include a brief explanation of why data from 2017 are not included.

7.7.3 The MMO raises concerns regarding the fact that data from 2018 have also been excluded from use in the back-calculation. We are aware that the 2018 survey was affected by severe technical problems with one of the research vessels, however, abundance data for the Banks component are available for that year (ICES 2020). The G1.8 Clarification Note should therefore be updated to include 2018 data, or alternatively, suitable justification for excluding the 2018 data should be provided.

7.7.4 The Applicant has considered the start dates of the IHLS surveys as one of their parameters for the back calculation and have determined an average survey start date of 24th September. Taking the survey start dates for the years shown in Table 1, the MMO is content with using the 24th September as an average start date for the back-calculation.

7.8 Larval Length in Survey Sample Data

7.8.1 A larval length of 9mm has been used in the back-calculation. The MMO notes that this length was chosen on the basis that 80% of all larvae recorded within the IHLS surveys from 2007 – 2020 were equal to or less than 9 mm in length; ranging from >56% in the 2007 and 2020 surveys up to 99.9% in the 2013 survey.

7.8.2 In principle, the MMO supports the use of a 9mm larval length for the purpose of calculating a conservative estimate of the start of peak spawning, noting that smaller larvae within the survey data will have been spawned later than the calculated start date. However, for the Banks herring stock, ICES classify newly hatched larvae as those <10mm, so taking a precautionary approach, it is also necessary to consider factoring in catches of larvae >9mm as these represent older larvae collected during the sampling period, which would indicate that some eggs are being laid in the first half of August. In order to interrogate the full range and abundance of all larval lengths the MMO requests that all larval data is presented e.g., tabulated or graphic form with standard deviation/error bars. We further recommend that the data is presented in two size ranges: a) 5 - <10mm, and b) 5mm – longest larval length. The data should be presented by individual sampling station so that the average length range by sampling station can be seen.

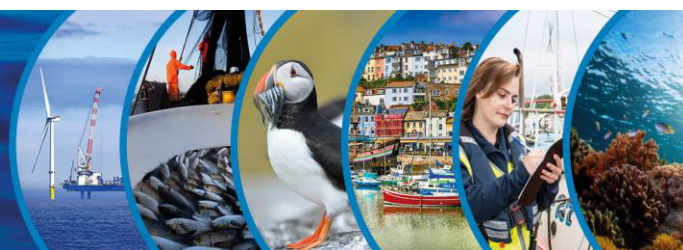
7.9 Larval Length at Hatching

7.9.1 Larval lengths at hatching of 6.5 mm (Heath, 1993) and 8 mm (Blaxter and Hempel, 1963) have been used as a back-calculation parameter, to provide a potential range of peak spawning timings based on varying hatch size assumptions. In the MMO's opinion, using these larval lengths does not give a conservative assumption. A conservative approach should factor in values at the extreme ends of the IHLS datasets. Therefore, a more conservative assumption, which better represents larvae that have not yet drifted away from the spawning grounds, would be based on the minimum larval length (5mm) and maximum larval length (10mm).

7.9.2 In addition to the required interrogation of the range and abundance of all larval lengths, the MMO suggests that a more comprehensive review of peer-reviewed literature is needed in order to determine and verify an appropriate larval hatch length for the Banks stock. For other projects impacting the Downs component, a hatch length of 7.5mm and 9.5mm was assumed based on appropriate literature (Dickey-Collas, 2005), though it is noted that these sizes are driven by the relatively large egg size compared to the Banks stock and other northern populations. The MMO will utilise time on any follow up consultations on this document, to undertake a more a thorough review of the evidence base provided.

7.10 Egg Development Duration

7.10.1 To determine the duration of egg development, a mean seafloor temperature of 12.2°C has been established using temperatures recorded at maximum sampling depth in the IHLS data. The mean seafloor temperature has then been used to determine the durations of temperature dependent egg development based on Russell (1976). The MMO supports the use of the egg development periods described in Russell (1976).



7.10.2 The MMO, however, does not support the approach taken to establish the mean seafloor temperature. A conservative approach should factor in values at the extreme ends of the IHLS datasets. Accordingly, to establish a mean seafloor temperature, all seafloor temperatures should be taken into account, particularly as it is noted that there has been increased variation in the spread of temperature values (higher and lower values) in more recent years of surveys (2016, 2019 and 2020). Furthermore, when considering piling noise propagation, it is inconsequential that temperatures <12°C in the 2016 – 2020 surveys were found to the north of Hornsea Four and the lowest temperatures (<10°C) were all recorded to the north of the primary larval hotspot within each year's data. Therefore, in order to determine an appropriate seafloor temperature/s, the MMO requests that the Applicant provides us with the IHLS sea temperature data in tabulated form, so that we may cross reference these values against the larval catch data and against the Applicant's average temperature.

7.11 Yolk Absorption Duration

For yolk absorption duration, a period of 5 days has been determined partly based on absorption periods described in Russell (1976) and the Applicant's mean seafloor temperature of 12.2°C. Whilst we support the use of the yolk absorption periods as described in Russell (1976), we do not support a mean temperature of 12.2°C (as outlined within 7.10.2 of this submission), therefore the yolk absorption period should be based on the recommended average seafloor temperature determined by interrogation of all IHLS sea temperature data.

7.12 Growth Rate

Using the equation from Oeberst *et al*. (2009) and an average seafloor temperature of 12.2°C a growth rate of 0.46 mm d-1 has been calculated. It is the MMO's opinion, that observationally this value is high and not conservative when compared to other values cited. For example, Heath (1993) notes that growth rates estimated from field investigations have been approximately 0.2 to 0.3 mm d-1 and used an assumed larval growth rate of 0.25mm d-1 for the calculation of larval production. Acknowledging that larval growth rates are temperature dependent and noting that we don't support the proposed average seafloor temperature of 12.2°C as a conservative value, we request that the Applicant present the values of larval growth rates cited in the G1.8 Clarification Note in a table, together with any relevant information noted from the literature, e.g. accompanying sea temperatures and stock. The MMO considers that the information will be more digestible for consideration against the requested IHLS sea temperature data.

7.13 Back Calculation

Whilst the method of back-calculation presented in Section 2.8 (2.8.1.4) of the G1.8 Clarification Note does not seem unreasonable, the values used to support it (i, ii and vi) are not considered precautionary based on the information presented. As outlined above, without sight of the IHLS data for interrogation to support the G1.8 Clarification Note, the MMO are unable to provide any further insight into what the appropriate, conservative values should be. Accordingly, at this stage we do not currently support the Applicant's findings of a start of peak spawning season of 5th September (Scenario A) or 8th

September (Scenario B). Nor does the MMO support the Applicant's proposal that the seasonal restriction should run from 1st September – 16th October.

7.14 The MMO thanks the Applicant for the effort that has been made to produce the G1.8 Clarification Note, and we confirm that the data sources used to inform this appear to be appropriate. However, as highlighted above, some of the calculated values used to inform the 'peak' spawning period are not considered sufficiently conservative to be precautionary. A precautionary approach requires allowance for early spawning in some years due to environmental changes (e.g., temperature) and stock size fluctuations which will affect spawning behaviour and timing. On this basis the MMO are currently unable to support a refinement of the seasonal restriction to 1st September – 16th October.

7.15 It should also be recognised that IHLS surveys are already intended to sample larvae hatched from eggs that were spawned during the peak of spawning. A lack of resources and participating countries restricts sampling to this limited period when the peak of larval production is most likely.

7.16 Taking into account our comments above, whilst a good start has been made and the approach to back-calculation seems reasonable, we are of the opinion that the evidence presented does not currently provide adequate justification for a reduced piling restriction and further interrogation of data and scrutiny of cited values are needed before a decision can be made.

7.18 The Applicant should also note that in past cases where this method has been applied for the purpose of refining/reducing a piling restriction, additional work was done which looked at noise spread in the context of larval size, using the modelled noise contours and IHLS data. This was done to estimate a migration period for herring to reach the spawning grounds before spawning. For example, at Rampion Offshore Wind Farm this was 8 days ahead of start of estimated earliest hatch date.

References

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